



UNIVERSITETI I PRISHTINËS
"HASAN PRISHTINA"
FAKULTETI I INXHNIERISË MEKANIKE

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Nr. Prot.: 142
 Datë: 24/01/2023

**RAPORT VLERËSIMI TË DORËSHKRIMIT TË PUNIMIT TË
 DIPLOMËS MASTER**

FAKULTETI	Fakulteti i Inxhinierisë Mekanike
Departamenti/Programi	Termoenergjetikë dhe energji e ripërtëritshme
Titulli i punimit	Turbinat e erës, ndikimi në mjedis, simulimi dhe modelimi i tyre
Kandidati	Albert Aliu
Mentori	Prof. Dr. Rexhep Selimaj
Aprovimi i projekt propozimit në Këshillin e Fakultetit	Datë: 30.12.2021 Vendimi Nr.: 1733

Vlerësimi i dorëshkrimit.

Në bazë të vendimit të Dekanit të Fakultetit, Nr.332 të datës 09.02.2022 është formuar komisioni me këtë përbërje:

1. Prof. Dr. Xhevat Berisha, *kryetar*
2. Prof. Dr. Rexhep Selimaj, *mentor*
3. Prof. Asoc. Dr. Bedri Dragusha, *anëtar*

për vlerësimin e punimit Master me titull "Turbinat e erës, ndikimi në mjedis, simulimi dhe modelimi i tyre" (*The wind turbines, environmental impact, their modelling and simulation*), të kandidatit Bsc. Albert Aliu.

Pas kontrollimit të punimit të lartpërmendur Komisioni jep këtë:

R A P O R T

Punimi me titull "Turbinat e erës, ndikimi në mjedis, simulimi dhe modelimi i tyre" (*The wind turbines, environmental impact, their modelling and simulation*) është hartuar në 8 kapituj dhe është ilustruar përmes 57 figurave, 17 tabelave dhe 23 formuale.

Në kapitullin e parë është prezantuar historiku i turbinave të erës, përdorimit të saj të thjeshtë – mullirit të erës, rregullat dhe tentimet e para për prodhimin e energjisë elektrike, deri në teknologjinë moderne të turbinave me erë gjeneruese të energjisë.

Në kapitullin e dytë është prezantuar ndarja e turbinave dhe përkufizimet për turbinat e erës me bosht horizontal dhe turbinat e erës me bosht vertikal, konceptet dhe shprehjet përkatëse për energjinë teorike të erës, lakoren e fuqisë dhe varësinë nga shpejtësia e erës, si dhe për eficiencën e turbinave të erës.

Në kapitullin e tretë është analizuar më në detaje aerodinamika e turbinave të erës, duke e përfshirë edhe atë dydimensionale, definimin e komponentëve të rrymave të erës të ngritjes dhe të zvarritjes – tërheqjes me koeficientet përkatës.

Formulari – F3

Në kapitullin e katërt janë dhënë njohuri të përgjithshme për sistemet e kontrollit të turbinave me erë përkatësisht të kontrollit pitch, kontrollit të ndaljes (kontrollit pasiv dhe atij aktiv), kontrollit Yaw dhe strategjitë e kontrollit të shpejtësisë.

Në kapitullin e pestë është analizuar ekonomia e energjisë e erës duke marrë për bazë kostot kapitale, kostot e operimit dhe të mirëmbajtjes, të ardhurat nga energjia e turbinave të erës, parashikimet e të ardhurave, faktorin e disponueshmërisë dhe faktorin e kapacitetit, prodhimin vjetor të energjisë dhe periudhën e kohës së kthimit.

Në kapitullin e gjashtë janë prezantuar ndikimet në mjedis të turbinave të erës, përfitimet dhe metat mjedisore nga turbinat e erës, ndikimet ekologjike, ndikimi kulturor, ndikimi në jetën e njeriut, ndikimi lokal ekonomik, ndikimi vizual, ndikimi akustik (i zhurmës), ndikimi në përdorimin e tokës, reduktimi i ndikimit negativ mjedisor i energjisë së erës.

Në kapitullin e shtatë është dhënë modelimi dhe simulimi i turbinave të erës. Fillimisht janë detajuar të dhënat rreth projektimit të turbinave të erës me aks vertikal dhe atyre horizontal duke specifikuar edhe turbinat Savonius dhe Darrieus (te TEBV) dhe variablat e projektimit për rotorin, transmetimit të fuqisë, sistemit të kontrollit, etj. (tr TEBH), mandej konsideratat e peshës, jetën e lodhjes, dizajnin për dridhje minimale, etj., të dhëna për energjinë e erës në Kosovë, si dhe modelimet dhe simulimet për profilin dhe fuqinë e erës.

Në kapitullin e tetë janë dhënë përfundimet dhe rekomandimet e nevojshme me konstatimet përkatëse për ndikimin e faktorëve të ndryshëm në energjinë e erës dhe në përdorimin e llojeve të turbinave përkatëse, duke përfshirë përparësitë, mangësitë dhe sfidat e përdorimit të energjisë së erës.

PERFUNDIM

Në bazë të shqyrtimit të punimit Master, Komisioni për vlerësim konsideron se punimi është hartuar në nivel të duhur, e që është i shtjelluar përmes figurave, tabelave dhe formulave. Prandaj, Komisioni për vlerësimin e punimit Master, të kandidatit Bsc. Albert Aliu, me titull " *Turbinat e erës, ndikimi në mjedis, simulimi dhe modelimi i tyre*" (*The wind turbines, environment al impact, their modelling and simulation*) konsideron se punimi i plotëson të gjitha kriteret për punim Master dhe propozon që të jepet në diskutim publik.

Prishtinë: 23/01/2023

Komisioni:

1. Prof. Dr. Rexhep Selimaj  - mentor

2. Prof. Dr. Xhevat Berisha  - anëtar

3. Prof. Asoc. Dr. Bedri Dragusha  - anëtar

P.S. Numri i faqeve shtohet sipas nevojës.

WP KXGTUKVGVKKRTKUJ VKP^ UδJ CUCP'RTKUJ VKP Cö''

HCMWNVGVKKKP ZJ KP KGTU' 'O GMCP KMG''

FGRCTVCO GPVKVGTO QGP^ TI LGVKM 'FJ G'GP GTI LKG'TR' TV^ TKUJ O G''



RWP KO 'F KRNQO G'O CUVGT''

VWTDKP CV'G'GT^ U.P F KMKO KP^ 'O LGF KU.'UKO WNKO KF J G''

O QF GNKO KKV[TG''

O gpvqt k' ''

Rt qh0F t0Tgzj gr 'Ugiko cl''

Mcpf kf cvk'

Due0Cridgt v'Crkw'

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HCMWNVGVKKKZJ KP KGTU 'O GMCP KMG'"

FGRCTVCO GPVKVGTO QGP^ TI LGVKM 'FJ G'GP GTI LKG'TR' TV^ TKUJ O G"

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RWP KO 'F KRNQO G'O CUVGT'"

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O QF GNNKPI 'CPF 'UKO WNCVKQP "

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I LKVM"ó"i lpggtcvqtKk'kpf wmlqpk'vu"nc| k'vu"ngvk'

MV"ó"Muqqlc"ncr kcrg"g"wt dkpui"Xgucv"

Q(O "/"Muqv'g"qr gto k'f j g'o kmo dclvgu"

RM/"Rgtkvf j c"g'mj ko k'

TRO "ó"pwo tk'ktqwnko gxg'pu"o kpwu"

VGDJ "ó"wt dpc"o g'gtu"o g'dquj v'j qtk qpvcn"

VGDX"ó"wt dpc"o g'gtu"o g'dquj v'xgtvnen'

V?O TT"/"o qo gp'ktqwnwgu"

VUT"/"ter qt'kk'uj r gl'vukpu"u"o clpu"

XUO "ó"xrtpuko k"utcvgi lkn'o lgf kuqt"

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C"ó"ukr pthcs lc"g'tqvtk'vu"wt dpu"o g'gtu"pu"*⁴+"

C"/"r ctco gvk'k'uj ncmu"Y gkdw"pu"o lu"

D"/"pwo tk'k'vj gxg"

E_n"/"nq'hekp'k'pi tkvgu"

E_f"/"nq'hekp'k'| xcttkvgu"ó"vtj gslgu"

Er"/"nq'hekp'k'f gcn'k'hwsku"* +"

F"/"f lco gvk"*o +"

G"/"gpgti lk'np'gkng"*P o +"

H_{cr}?h"ó"ncmqt'k'ncr cekgvk'

J "ó"ncvukc"g"wt dpu"

K/'tt {o c"grgmtkng"g"o qvtk'grgmtkn"*o C+"

m"/"r ctco gvk'k'hqto pu"Y gkdw"

m_o"/"j wo dlgv'o gncpkn'vu"vj gxg'f j g'nwku"u"o ctuj gxg"

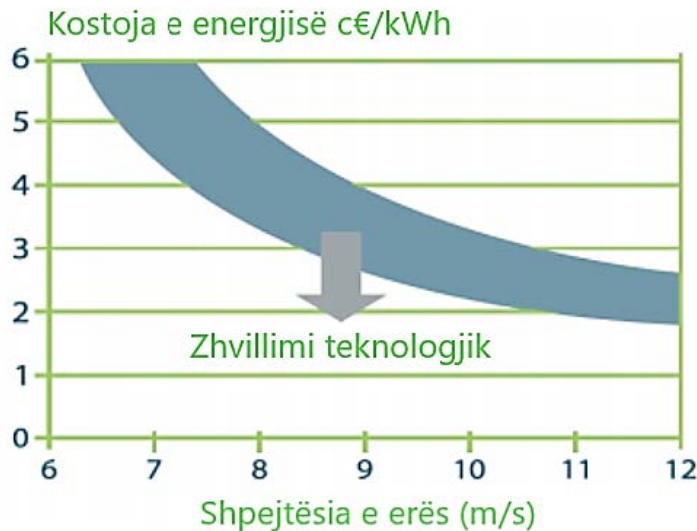
m_j /"j wo dlgv'grgmtkng"v'wtdkpuu"
 m_v /"j wo dlgv'grgmtkng"v'tcpuo gko k'pu'ttlgv"
 m_r /"r mts kpf lc"gnqj mu'lcuj v'hwpmikqpk'r mt'uj neni'v'f muj vko k'qug'o kmo dclvlgu"
 m_j /"j wo dlgv'r cuwgug'r mt'uj neni'v'wtdkpcxg'hs kplg'f j g'vqr qi tchku'v'vgttgpkv"
Nv'ó'i lcvukc"gv'gj w'er q'ttg| lc"gv'wtdkpuu'o g'dquj v'j qtq qpvcn'
o "/"o cuc"gttlgf j lgu"*mi +"
R/"hws kc"*Y +"
 R_{gtmu} "ó'hws kc"gf kur qpwguj o g'g'gtmu"
 R_{cev} /"hws kc"cmwerg"gr tqf j wct "
 $R_{o_{cz}}$ /"hws kc'pu'nær cekgvk'p'o cmko cn'
 $R_{o_{cz}}$ /"hws kc'vgqtkng"gtmu"*Y +"
 R_v /"hws kc'vgqtkng"gtmu'pu'Xcv"*Y +"
Tg/"pwo tkTg{pqrf "
T/"ttg| lc"*o +"
W/"vgpukqpk'grgmtknik'o qvqt'k'grgmtkn"*X+ "
x"ó'uj r glvukc"gtmu"*o lu+ "
Xt/"uj r glvukc'ttqwmwug"*o "u/3+ "
| 2/"rctvukc"gr'utchtv"*o + "
 η /"ghkucvkt'gcn'
 η_{gn} /"ghkugpec"grgmtkng"
 $\eta_{o_{gm}}$ /"ghkugpec"o gncplng"
/"ter qt'k'uj r glvukc'v'v'v'o clmu"
 ρ /"f gpf vukc"g'cltk'pu"*mi lo⁵+ "
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J [TLG"

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Gpgti lkc" g"gtmu"µuj vµ"plµ"vgnpqmµi lk'tgrvkkuj v'g"j gtuj o g0'Clq"nµpmttqp"o g"dwtko gv'g"vlgc"vµ" gpgti lkµ"r µt" uc" k' r µtngv' ±o ko kv" ghgmngx" o lgf kuqtg" f j g" r µtf qtuj o µtkµ0' O g" r µtlcuj vko " vµ" j kf tqegpvcrgxg."gpgti lkc" g"gtmu"µuj vµ"o µ"chµt"r µthkwgµj o µtkµ"nµo gtekrg"ug"±f q"dwtko "vlgµt"K" tlpqxwgµj µo 0' Gpgti lkc" g" gtµu" µuj vµ" i lgtµukuj v' g" cr rkmwgµj o g" ugr ug" dwtko gv' g" gtµu" lcpµ" vµ" f kur qpwgµj o g"pµ"uj wo kµp" g"xgpf gxg0'P f µt"vgnpqmµi lkµ" g"gpgti lkµ"µu"tkpaxwgµj o g."gpgti lkc" g" gtµu"µuj vµ"tgrvkkuj v'g"xlgyµt" f j g"uj wo µ"xgpf g"nµpµ" i lkf j vt"uhkf cv" g"nµvqu" f j g"vgnpqmµi lkµ" r µto gu'µucl"gpgti lkg"µki 03+0'



Hki wt c'30Mµuqµlc" g"gpgti lkµ"µu"gtµu"pµ"tcr qt v'o g"uj r gl vµukpµ" g"gtµu" i lcvµ" xkkv"

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Gtc"µuj vµ" g'r cuvµt. "g'rkµ. "cwqmµpg" f j g" g'r cuj vgtuj o g0'Vwt dµpcv'o g"gtµ"pwnµnµpµ"pµxqlµ" r µt"cuplµ" nµl" nµtdwtcpk" nµuj w' s µ" pwnµ nµ" ttgl ks g" o lgf kuqtg" qug" f gi tcf ko " pi c" gnr µtko k" pzlgttlc." vµpur qt vµ" f µti gµc. "r µtr wµko k'qug" cui lµuko k'uk±" pf qf j "vµnµµpxgµekµpcrgv0I lgpµtko k'lq" xgµo " s µ" r tqf j qj gv'o g" l gtq" go gvko g" vµ" f kµµkf k' vµ" nµtdqpk" µi lcvµ" hc" µu" µu" qr gµko kv: " r qt" i lkj cuj w'pwnµ rktqp" pf qµu" vµµkµµ" µr µt" uj go dwnµ" o gµnµt " qug" pf qµu" vµ" | cµµpµj µo " vµ" cltk" µuk' r µt" uj go dwnµ" f kµµkf k'k'c' qvµ" s µ" hqto qp" uo qi / wµ" f j g" f kµµkf k'k'us vµwt k' s µ" hqto qp" uj kwµ" cµkf kµ0'Rtqlgmµv' g" gpgti lkµ"µu"gtµu" f vj gv' vµ" xgpf qugp' pµ" r µtr wj lg'o g' Cµµkµ" g' Rµpµkµko kv: r µpµgtclqpcrg" f j g' r µpµv' nµo wpcng0'Rµpµv'tclqpcrg" qhtqlpµ" xgpf pf qf j lg" vµ" r µti lkj uj o g' r µt" r tqlgµµv' g"gtµu" f j g" w' f j µl ko g"

r μt "kp̄gi tko kp" g" wtdkpcxg" o g" gtm" o g" r μtf qtko g" v̄i "v̄gtc" v̄i "v̄qmu0 R̄m̄pgv" n̄qo wpcrg" o wpf " v̄i " r μthuj k̄p̄u" qdlgm̄kxc" f̄j g" f̄ μuj k̄c" s̄ μ" h̄f̄ j gp" o g" gp̄gti l̄k̄p̄u" g" gtm" f̄ j g" v̄i "q̄ht̄ql̄p̄u" p̄l̄u" d̄c| μ" o μ" v̄i " f̄ ḡclwct" r μt "x̄gpf pf qf j l̄gp. " p̄wo t̄kp. " r̄ct̄v̄ūk̄p̄u" f̄ j g" r̄ co l̄gp" g" wtdk̄p̄u0 Ḡp̄gti l̄k̄" g" gtm" μuj v̄i " p̄l̄u" v̄gn̄p̄q̄m̄i l̄k̄" g" r̄ c̄v̄ȳt " f̄ j g" o k̄s̄ μ̄q̄t̄g" o g" o l̄gf̄ k̄k̄p̄" s̄ μ" r̄ tqf j q̄p" gp̄gti l̄k̄" ḡr̄m̄t̄k̄m̄g0 M̄ct̄c̄m̄gt̄k̄k̄" ucl" uk" g" t̄kp̄q̄x̄w̄ḡuj o g" f̄ j g" h̄cm̄k̄" s̄ μ" p̄w̄n̄| p̄f̄ q̄v̄i l̄c̄v̄i " h̄c| μ̄u" v̄i " q̄r̄ ḡt̄ko k̄" g" d̄up" c̄v̄i " p̄l̄u" p̄i c" ūk̄v̄go ḡv̄gp̄gti l̄ḡv̄k̄m̄g" o μ" r̄ t̄go w̄ḡug" r μt " t̄gf̄ w̄m̄ko k̄p" g" r̄ tq̄d̄rgo ḡx̄g" o l̄gf̄ k̄ūq̄t̄g" p̄u" p̄k̄x̄ḡn̄i n̄q̄d̄c̄n̄f̄ j g" h̄q̄n̄ēr0

Ḡp̄gti l̄k̄" g" gtm" μuj v̄i " p̄l̄u" o μ̄p { t̄μ" c̄n̄gt̄p̄c̄v̄x̄g" g" r̄ tqf j ko k̄" v̄i " ḡr̄m̄t̄k̄ēk̄ḡv̄k̄. " ḡf̄ j g" r̄ ug" n̄q̄ūv̄q̄l̄c" g" r̄ tqf j ko k̄" μuj v̄i " o μ" g" r̄ct̄v̄i " ūḡuc" cl̄q" g" r̄ tqf j ko k̄" p̄u" o μ̄p { t̄μ" v̄t̄c̄f̄ k̄ēk̄q̄p̄c̄rg0 Ḡp̄gti l̄k̄" g" gtm" μuj v̄i " r̄ μtf̄ q̄t̄w̄t " r̄ μt " i l̄gp̄gt̄c̄v̄ " v̄i " v̄t̄c̄" p̄u" | q̄p̄c̄v̄g" r̄ct̄i μ̄v̄ " f̄ j g" m̄w̄t " w̄f̄ j μ̄v̄q̄p̄k̄r̄ μ̄ti l̄c̄v̄i " x̄ḡpf̄ k̄" o w̄pf " v̄i " ūj k̄n̄q̄p̄k̄" w̄tdk̄p̄c̄" v̄g" o μ̄f̄ j c" ḡt̄g" p̄u" h̄w̄uj c" v̄i " | d̄t̄c| μ̄v̄ " c̄r̄ q" o c̄f̄ l̄g" c̄h̄t̄ " p̄l̄u" h̄ḡto g" v̄i " x̄l̄ḡv̄t̄0 V̄w̄tdk̄p̄c̄" g" gtm" o w̄pf " v̄i " r̄ μtf̄ q̄t̄μ" p̄l̄u" v̄k̄ " ūk̄v̄go k̄" v̄i " t̄w̄c̄l̄v̄ḡu" v̄i " gp̄gti l̄k̄p̄u" v̄i " t̄l̄ḡv̄k̄r̄ μt " v̄w̄r̄ μtf̄ q̄t̄w̄t " o μ" x̄q̄p̄u0 V̄w̄tdk̄p̄c̄v̄g" gtm" x̄ḡv̄i " o w̄pf " v̄i " c̄t̄t̄k̄p̄u" f̄ ḡt̄k̄p̄u" 622" Y . " h̄w̄s̄ k̄" g" o l̄ch̄w̄ḡuj o g" h̄d̄q" r̄ μt " v̄w̄r̄ μtf̄ q̄t̄w̄t " r̄ μt " o w̄m̄k̄p̄l̄v̄i " o g" gtm" 0 V̄w̄tdk̄p̄c̄v̄g" x̄q̄i r̄ " h̄ēp̄u" i l̄gp̄gt̄c̄v̄q̄t̄μ" v̄i " h̄k̄ j w̄t " f̄ k̄ḡn̄v̄. " o g" q̄w̄r̄ w̄ḡ" f̄ k̄ḡm̄g. " v̄i " ēk̄v̄ | c̄n̄q̄p̄k̄uj v̄r̄ μtf̄ q̄t̄gp" p̄u" h̄ḡto c" q̄ug" s̄ ḡp̄f̄ t̄c" d̄c̄p̄ko k̄" v̄i " x̄q̄i r̄ 0 P̄ l̄u" p̄i c" c̄t̄i w̄o ḡp̄v̄ḡn̄t { ḡūq̄t̄g" v̄i " r̄ μtf̄ q̄t̄ko k̄" v̄i " gp̄gti l̄k̄p̄u" v̄i " gtm" μuj v̄i " ug" cl̄q" μuj v̄i " p̄l̄u" d̄w̄tko " k̄" t̄kp̄q̄x̄w̄ḡuj μo . " s̄ μ" f̄ q" v̄i " v̄j q̄v̄i " ug" cl̄q" p̄w̄n̄i " o w̄pf " v̄i " r̄ c̄m̄ūq̄j ḡv̄uk̄" d̄w̄tko ḡv̄" g" v̄gtc. " r̄ Q̄ij 0 n̄ēt̄d̄q̄p̄k̄0 Ḡp̄gti l̄k̄" g" gtm" p̄w̄n̄i " r̄ tqf j q̄p" ūw̄d̄ūc̄p̄ēc" v̄q̄m̄k̄m̄g" uk̄" r̄ Q̄ij 0 f̄ k̄q̄m̄k̄f " n̄ēt̄d̄q̄p̄k̄" c̄r̄ q" p̄f̄ q̄p̄l̄u" n̄q̄l" v̄ḡv̄t̄ " p̄f̄ q̄v̄l̄ḡl̄g. " r̄ t̄c̄p̄f̄ c̄l" n̄q̄p̄ūk̄f̄ ḡt̄q̄j ḡv̄uk̄" d̄w̄tko " gp̄gti l̄k̄" k̄r̄ c̄v̄ȳt̄0 H̄ēm̄k̄ μuj v̄i " ug. " r̄ tqf j ko k̄k̄" gp̄gti l̄k̄p̄u" v̄i " gtm" μuj v̄i " k̄h̄w̄uj w̄ḡuj μo " r̄ q̄t̄" t̄g| w̄n̄q̄p" h̄w̄t̄uko v̄c̄t̄" p̄u" v̄ḡto c" c̄h̄c̄v̄i l̄c̄v̄i " f̄ w̄ng" n̄w̄t̄u { ḡt̄" d̄w̄tko ḡv̄" g" v̄gtc" v̄i " ēk̄v̄" o w̄pf " v̄i " x̄c̄t̄h̄t̄q̄j ḡp" p̄u" v̄i " c̄t̄f̄ j o ḡp0

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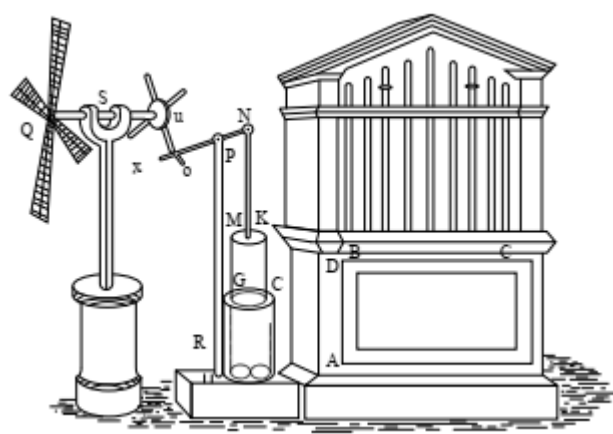
30 J KUVQTKMWKVVWTDKPCXG'V^ 'GT^ U'

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Gf j g" gpgti lk" g" gtµu" f wj gv" r cuw" j kvqt k' J kvqt k" uj µt dgp" r µt" vµ" kxwt wct" ±µuj vlgv" o g" vµ" ekrcv" ukvgo gv" g" gpgti lkµ" vµ" gtµu" gpf g" r µt dcmgp" uqvf j g" qht qp" r cus { tµ" tt gy " wtdkpcxg" ukf wngp0

Tghgt gpec" g" r ctµ" j kvqt kng" g" plqj vt" r µt" o wrk k' p" g" r ctµ" o g" gtµ" µuj vµ" pi c" J gtq" k' Crgmcpf tkµ. " pµ" xgr tµp" g" vµ" Rpgwo c vµe " *Y qqf etqhv. " 3: 73+0J gtq" dguaj gv" vµ" ngvµ" lgwct" qug" pµ" uj gmwrk p" Kr QG00 qug" uj gmwrk p" Kr cu' Mtkuj v k0Rpgwo c vµe " g" vµ" r µt uj nt wcp" plµ" r clkul g" g" ekrc" r µto gu' cltk' tt qwµµp" plµ" dquj v" g" s µ" µuj vµ" s wclwt" o wrk k' gtµu0P lµ" kxwt ko " s µ" uj qs µt qp" r µt uj nt ko k' p" g" J gtqk' vgi qj gv" pµ" hki wtµp" 40'

Mc" r cuw" f kuc" f gdcv" pµug" nµ" gmµ kxwt " plµ" o wrk k' vµµ" o g" vµ" xµt vgvµ" f j g" pµug" kxwt ko k' uj qs µt qp" pµ" vµ" xµt vgvµ" f qmwo gpvgv" qtki lkpcng0Ukf qs qhµ. " plµ" pi c" uwf kvguk' nt { guqtµ" o dk' nµvµ" vgo µ. " J 0R0 Xqy ngu. " *Xqy ngu. " 3; 54+ g" nµpukf gtqp" r µt uj nt ko k' p" g" J gtqk' uk' vµ" dguwguj µo 0P lµ" pi c" cti wo gpvgv" nµpf µt" i tgmuxg" vµ" j gtuj µo ' µuj vµ" uqhkvkno k' vgnpqrµi lkni k' nµj µu0Ukf qs qhµ. " ukf vµµ' dnwctµµ. " cuj w' gf j g" kpi tpcp| j gv. " vµ" ekrcv" | cµµpkuj v' r µt f qtgp" o g" plµ" tqvqt" vµ" f tglwct" pi c" gtc. " f kj gl" s µ" gmµ kvqpk' pµ" nµj µp" g" J gtqk' 0Rµt" uj go dwm" Tg { pqr f u" *3; : 5+ r µt uj nt wcp" tt qv v' dnwctµµg" o g" vµµ' pµ" c vµ" nµj µ0 Rµt" o µ' vgr µt. " cpcrk' c" g" o gnrpk' o k' Cpvµµ' vj gtc" *O ctej cpv. " 4228+ nµphkto qp" ug" I tgmµv" g' j gtuj µo " nkuj k' pµ" vµ" nµµµ" vµ" rct vµ" uqhkvkno k' pµ" r tqf j ko k' p" f j g" r µt f qt ko k' p" g" dquj vgxg0



Hki wtc"40"0 wrk k' k' Gtµu" k' J gtq/ k'

"

Rµtxg±' b wrk k' vµ" gtµu" vµ" J gtqk' v' ghgt gpec" vlgvµt' b dk' nµvµ" vgo µ' f cvqp" pi c" vµ" gmwrk k' / vµ" r cu' Mtkuj vµ" *Cn0 Cuwf kük±' tcr qt vqj gv" pi c" Xqy ngu. " 3; 54+0 wrk p' vµ" b g' gtµ" k' k' p' r cvlgvµt' pµ" r µt f qt ko ' pµ" t clqpk'

g'Rgtuku'p'u'Ugkucp'c'v'u'huj μ'c'p'k'Kcpkk'Uq'uo +0Cn'0 cuwf k'i lkj kuj w'tgi qk'p'μ'j k'v'q'k's μ'tgi qp" ug'o w'k'p'v'u'o g'gt'μ'kuj k'p'p'μ'r μ'f q'tko "f g'tk'p'μ'x'k'k'p'866'r cu'M'k'uj v'k'0'0 w'k'p'v'u'o g'gt'μ'v'u'Ugkucp'k' n'c'p'μ'x'c| j f w'c't"v'u'r μ'f q'tgp" f g'tk'p'μ'μ'j μ'p" g'v'c'p'k'uj o g'0'M'v'c"o w'k'p'l"o g'gt'μ'n'kuj k'p"t't'q'w'w'v'g'u"v'u" d'q'uj v'k'v'x'g't'v'k'n'c'n"u'k'k'k'w'v't'q'j g'v'p'μ'h'k'i v't'μ'p"50'



H'k'i w'tc"50'0 w'k'k'k'G't'μ'u'Ugkucp"3"

O w'k'p'v'u"o g'gt'μ'g" d'p'p'μ'r c't'c's k'l'g'p" g"v't'g"v'u'r c't'μ'v'u't'g'i l'k'v'w'c't"p'μ"G'x't'q'r μ'p"x'g't'k'q't'g"*C'p'i r'k'i"p'μ" u'j g'm'w'k'p'g'34/v'u.'r q't'p'f'q'uj v'c'b' d'μ't't'k'v'p'p'μ'uj g'm'w'k'p'g'32/v'u'q'u'g'33/v'u"X'q'y r'g'u.'3; 52+0C'v'b' w'k'p'l" o g'gt'μ'kuj k'p" f'w'μ'j μ'o "v'u"p'f' t { u'j μ'o "p'μ" f'w'v'g"o g'c'v'c"v'u"Ugkucp'k'."f'j' g"n'c"r'c'u'w't"ur' g'm'w'k'o g'v'u" n'q'p'k'f' g't'w'g'uj o g'p'μ'ug'f'j' g'v'k'o v'p'f "v'u'n'kuj k'p"p'f' k'w'c't"o w'k'p'v'u'g"Ugkucp'k'p'μ'c'v'q's'μ'w'uj h'c's'μ'p'o μ" x'q'p'μ'p'μ'G'x't'q'r μ'0P' w'v'i'h'c'r' μ't'i l'k'i l'g'v'u'r' t'g't'μ'μ'v'w.'r' q't'X'q'y r'g'u'3; 52'h'c'w'v'i l'g't'w'c't's'μ'X'k'k'p'i μ'v.'v'u'ē'k'v'v' w'f'j' μ'v'q'p'k'p't't'g'i w'k'uj v'p'i c'G'x't'q'r c'X'g't'k'q't'g'p'μ'N'k'p'f' l'g'p'g'O' g'u'o g.'b' v'p'f 'c'v'c'n'kuj k'p'v'l'g'm'v'h'μ'p'eg'r' v'k'p'p'μ" p'l'μ'p'i c'w'f'j' μ'k'o g'v'g'v't'g'v'u'μ'j' k'o k'0"

P' l'μ'uj μ'p'k'o 'k'p'v'g't'g'uc'p'v'r' μ't'μ'v'μ'g'x'q'v'w'ek'q'p'v'u'j' g't'uj μ'o 'h'c'v'u'd'μ'μ'b' g'p'f' t { u'j' k'o k'p'p'μ'b' q'f' g'r'k'p'g't'q'v'q't'k'v' p'i c'b' w'k'p'v'u'g'gt'μ'u'Ugkucp'p'μ'c'v'q'v'u'G'x't'q'r μ'u'x'g't'k'q't'g'0T'q'v'q't'μ'v'g'Ugkucp'k'h'kuj k'p'c'm'ug'x'g't'v'k'n'c'g'f'j' g" f't'g'l'v'q'j' g'uj k'p"p'i c" h'q't'ec" v'μ't'j' g's' μ'ug'0'U'k'v'u' v'k'n'c" c'v'q" k'uj k'p"p'μ" x'g'w'g'v'g"l'q'g'h'k'n'c'ug" f'j' g'x'g'c'p'μ't'k'uj v'v'u" p'f' l'g'uj o g'p'f' c'l'f' μ'o v'k'o g'x'g'p'i c'g't'μ't'c'v'g'h'q't'v'c'0'F' k' c'l'p'μ'v'g'G'x't'q'r μ'u'X'g't'k'q't'g'n'kuj k'p'c'm'ug'j' q't'k' q'p'v'c'g" f'j' g'f't'g'l'v'q'j' g'uj k'p'p'i c'h'q't'ec'v'p'i t'k'μ'ug'0'U'g'v'k'g't'f'j' k'h'v'v'c'p'l' l'ek'q'p'p'w'n'v'μ'uj v'u'h'w'r' w'c't"o k'μ.'r' q't'k'uj' v'g'p'l'μ" | j' x'k'n'k'o 'k'o c'f'j' 0'U'k'f' q's' q'h'μ.'o v'p'f "v'u'w'r' q'l' q'j' g'v'ug'g'x'q'v'w'ek'q'p'k'k'o q'f' g'r'k'v'u't'q'v'q't'k'v'u'o w'k'k'k'o g'gt'μ' t'g'l' w'v'q'k'p'i c'r' μ'f' q't'k'o k'k'c'p'k'g'x'g'b' g'x'g'v'c'v'u'o k'l'μ'x'l'g'c't'k'v'u"3/t'μ'r' c'u'g't'μ'u'v'u't'g'0"

¹researchgate.net/figure/Sketch-and-ruins-of-the-drag-based-Persian-windmill-Panemone-still-in-use-in-some_fig1_271834937

Gtc'xc| j f qk'vu'kuj vg'plu'dwtko 'nt { guqt 'k'gpgti lkup'pu'Gxtqr u'i lc'vu'r gtwkf j uu'r enir etc "Tgxqmwkqpk' kpf wwtken 'r qt 'tupf juke "g'ucl 'hkmqk'vu'dlg'r cu'cucl 'nqj g0Ctu { glc's u'gpgti lk'g'gtmu'hkmqk'vu' j f wngl' nt { gulkuj v' k' ctkdwaj gv' lq/f kur qpwguj o utkuu' u' ucl' f j g' lq/vtcur qtwguj o utkuu' S { o { tk' nkuj vg' uj wo u'r utr ctmu'k'vu'ekrc'v'g'tc'pwm'k' qvtqpvg0S { o { tk'o wpf "vu'tc'pur qt vqj gl' mwf q's u'f vj gl' f j g'vu' r utf qtgl' mwf q0"

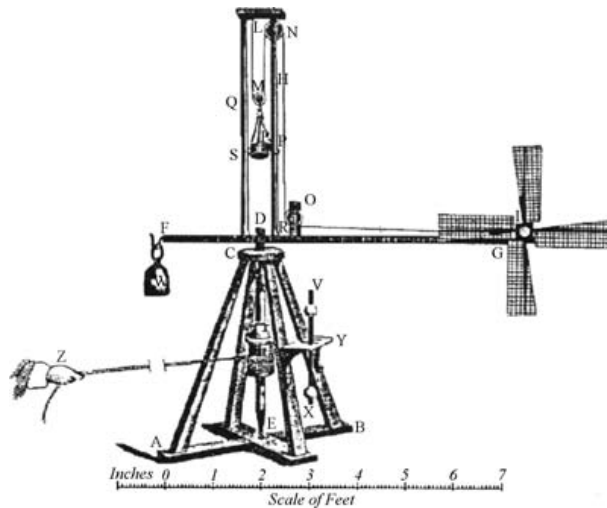
Rcu'plu'huj g. 'b wrk'k'gxtqr kcp'kgtmu'hkuj vg'cttkwt 'plu'pkxgn'vu'rc'vu'vu'uhkukuko k'vu'f k' clpk0F k' clpk' k'tk'kuj vg'k'r cnu'k' uj mo . "mw'xgyuo 'r lguc'rc'vu'ttqwmqj gl' r ut'vu'kw'r utuj v'cw't'gtmu. "hki wtc'60'Vgj gv' nkuj kp'hkwet'plu'hqto u'vu'ttchuj uv'f j g'r en'vu'y { gt0Rtqf j ko k'k'gpgti lkup'o wpf "vu'ttgi wmqj gl' pi c' plu'ukugo "cwqo cvkn'nqptqnk0'Mk' "kuj vg'r ctectf j ju'k'k'ukugo k'vu'r utf qtwt "pi c" Lco gu"Y cw'pu" o qvtmu'vo g'cxwnt'

P lu' j xknko "k'tupf ju'kuj mo "pu'uj gmw'k'g'3: /vu'kuj vg'hwlc" g'v'guko k'f j g'xrgtmu'ko k'uj ngpeqt "vu" o wrkpl'xg'o g'gtmu'0Cpi ngl' k'lj p'Uo gc'v'p. 'f wng'r utf qtwt 'plu'cr cte'v'vu'v'kn'u'k'k'w'utqj gv'pu'hki w'v'p' 6. ' dwqk'v'g'ttgi w'rc'dc| u's u'lc'pu'gpf g'vu' d'cw'guj o g'<

- o Uj r gl'vu'k'g'o clmu'vu'vgj g'xg'cr q'nr cv'xg'ju'j vu'kf ger'kuj v'pu'r tqr qtekq'p'o g'uj r gl'vu'k'pu' g'gtmu'0'
- o R'ut'f'g'f' j lc'o cmiko crg'ju'j vu'pu'r tqr qtekq'p'o g'uj r gl'vu'k'pu'g'gtmu'vu'pi tkwt 'pu'nc'v'qt0'
- o H'ws'k'o cmiko crg'ju'j vu'pu'r tqr qtekq'p'o g'uj r gl'vu'k'pu'g'gtmu'pu'h'ws'k'pu'g'v'g'v'0'

"

O wrkpl'vu'gxtqr kcp'vu'gtmu'vu'uj gmw'k'vu'3: /vu'r m'hc's ju'q'p'ko u'vu'o k'k's culgp'ug'uk'g'tc'o wpf "vu" r utf qtgl' r ut' gpgti lk' o g'nc'p'kng' f j g'r m'hu'j k'p'p'lu' p'wo ut' n'ctcm'g'tk'v'k'nc'uj "vu'ekrc'v'o u'x'q'pu'w' k'pn'qr qt'wep'pu'f kuc'w'dk'p'c'vu'j g'tuj o g'o g'gtmu's u'i l'gp'gt'q'p'k'gpgti lk'g'rg'm't'kng'0'



Hki wtc'60'Cr cte'w'tc'v'gu'w'gug'h'rd'q'tc'v'q't'kng'g'Uo gc'v'p'r ut'o wrkpl'vu'g'gtmu'

"

Rutftgtkuc"o wrkplvu"extqr kcp"vu"gtmu'r q"j { plp"pu"xkxgv'g'v'tg"vu'hwpfkv.'plu'xctkcpv'vlgvut 'k'o wrkplxg"
o g"gtmu"j { tk'pu'r utf qtlo "vu"i lgtmu"pu"Uj vgvv'g"Deuj mwctc0'Ml' "mql"o wrkkt'o g"gtmu."k'kwutwet"pu"
hki wtup"7."mu'j vu"r utf qtwt"o mu"vu"uj wo vk'r ut"r qo r ko kp" g"wlk."xg+cpukuj v"pu"r gtpf ko 0' Cvc"
r utf qtguj kp"pu"hgto c"r ut"dcu'vk'f j g'r ut"vu"hwtpk' wct"o g"vlmu"ucekppgv'g"v'gpcxg"o g"cxwv0'Mux"
o wrkpl" kuj kp"vu" f cmvguj mu "r ut" nqr cxcv" g" v'tg"vu"uj wo vc0'P lu"pi c" nctcmgtkuknev" g" v'tg"o mu"
f qo gyj ppuug'kuj vg"ug"nuv'v'wtdkpc'nkuj kp'plu'ukuvgo 'ttgi wmwgu'vu'y lguj vu'r qt"ghgmkx0'Mlq'rglqk's mu"
wtdkpcv" vu" hwpukpqpkp" r c" o dknus {tlg" r ut" r gtwf j c" vu" i lcv0' Ukuvgo g" vu" vkrc" ttgi wmwgug"
r ctcuj knqpk'ukuvgo gv'g'huvtqnk/cwqo cvkm"vu'ekcv'cpk'lcpu'r lgu'r utdmutug'g'wtdkpcxg'o qf gtpg"
vu"gtmu0



"

Hki wtc"70F k' clpk'co gtnep'k'wtdkpu'vu"gtmu'r ut"r qo r ko "vu'wlk"²"

"

"

3080"Rt qf j ko kk'gpgti lku'grgmtkn'pi c'gtc'd'Vgpvko gv'g'r ctc"

"

Uj ht {vu' ko k'pu'uj ncmu"vu"i lgtmu" k'gpgti lku'grgmtkn'hkmk'o g'p'f utvko kp" g"v'gto qegpvcrgxg"vu'r ctc0'
Vgto qegpvcrgv'g'r ctc'pu"dqvu'w'p'f utwcp'pu" P lwLqtm'o g'plu'hws kr' tgl'ttgyj "722"mY "pu"3: : 4+f j g"

² <https://www.flickr.com/photos/traveller2020/6522736259>

pu'Dgtrkp*3: : 6+]3_0Tt{o c'tghc| qtg'w'r tgl cpwec's {uj 'pu'xkklp'3: ; 30Vgnpqmql lkc'g'vgo qegpvcrk' gxnwqk'o g'uj r glvuk'fj g'r tqfj qk'r tqfj ko g'gpgti lkg'i lkj plu'pu'ttklg0'P i c'hkko k'k'uj gmwrk'vu' plul gyu.'r qvj wclug'vu'i lkj c's {vgyv'g'o uf j c'pu'xgpf gv'g'kpf wwtlcrk' wctc'hwtpk' qj guj kp'o g'gpgti lk' grgmtkng0'

Grgmtkknko k'k'| qpcxg"twercg"w"| j xkmec"o g'plu'tkmo "f wnuj mo "o mu'vu'pi cf cmu0'Rctcmwuj vgv'g" pgxqluj o g'w'ntklwcp'xgvo "pi c'pf utrk'fj lc"gmqlgxg'vu'pft {uj o g'vu'vgo qegpvcrgxg'fj g'pi tklc"g" ttlgvxxg'vu'i lgte'vu'tcpuo gko k0P f utuc'pu'Gxtqr mu'fj g'xg+cpukuj v'pu'I lgto cpk'm' | j xknko "cttkk' r qvj wclug"pu'huj c'vp"o mu'vu'rti mu'pi c"xkgv'plul gv."j cr lc" g" | qpcxg"twercg"pu'uj vgyv'g'o uf j c" vgttkqtkcrg'mutmqpv'g'r utr lgnlg'vu'o uf j c0P mu'UJ DC.'tclqpgv'g'o uf j c'vu'Rgtupf ko k'w'hwtpk' wcp'o g' gpgti lk'grgmtkng'f g'k'pu'xkklp'3; 54'pu'vu'cu'j ws wclwtkp'\$Rtqi tco k'k'Grgmtkknko k'Twcrö0'

Rutr lgnlgv'g'r ctc'r ut'vu'i lgpgtwct'tt {o mu'grgmtkng'o g'p'f kj o mu'g'gpgti lku'vu'gtmu'w'dupmu'pu'c'vu' r g'k'w'fj mu'naj qtg'mwt's {vgyv'g'o uf j c'cu'j o mu'r q'hwtpk' qj guj kp'o g'gpgti lk'grgmtkng.'r qt'o dwko k'k' r mu'k'r' utf qtvguxg'pu'| qpcv'twercg'pwn'kuj vg'gpf g'k'tgcrk' wguj mo 0'Rutj cr lc" g"o wnkplxg'o g'gtmu' vcf lekqpcn'pu'Gxtqr mu'fj g'g'wtdkpcxg'o g'gtmu'pu'Co g'kmu'kuj vg'gpf g'r qvj wclug'pu'mwo kp'g'ucl0' O gi lkj c'vu.' | j xknko k'k'r ctmu'ukngo c'kms' mu'u' {pqpvg'r utf qtko kp'g'gpgti lku'vu'gtmu'r ut'r tqfj ko kp'g' gpgti lku'grgmtkng'w'| j xkmec'pu'F cplc' ctmu0'

"
"

3040 'RqwiNc'Eqwt'ö'Pko µctk'pu'F cplc' ctmi'

"

Uk'cumwuj 'lgyut."go tk'RqwiNc'Eqwt'uj µpqp'r knup'g'mj guuu'pi c'pf utvguc'j kvqtkneg"g'o wnkplxg'o g' gtmu'pu'vgnpqmql lkpu'o qf gtpg"vu'wtdkpcxg'o g'gtmu'i lgpgtwug"vu'gpgti lku0'Mlq"µuj vu'o g'kmu'g' r µtuqulgu"vu'vgnpqmql lku'v'cf lekqpcrg"vu'o wnkplxg'o g'gtmu'pu'dc| mu'vu'r ctko g'xg'uj ngpeqtg"vu' r utr wpwctc'pi c'ck'fj g'ck'kuj vg'plu'r kqpkgt'k'r tqfj ko k'vu'gpgti lku'grgmtkng'o g'cpu'vu'gpgti lku'vu'gtmu'/'g'i lkj mu'ndq'pu'uj gmwrk'g'pµpvo duf j lgyu0'

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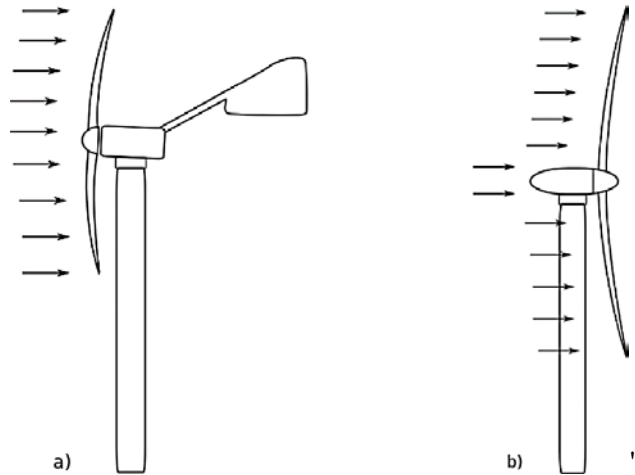
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40 'VWTDKPCV'G'GT^ UFJ G'PF CTLC'G'VJ TG''

"

Vwtdkpc" g" gtµu" µuj "µ" o cnkpgtk" g" ekc" dup" uj p f uttko k p" g" gpgti lkµ" nkpvkng" µ" gtµu" pµ" gpgti lk' grgmtkng0" uj µ" g" nwpf µtvc" g" b) wntk' µ" gtµu) " g" ekc" µuj "µ" o cnkpgtk's µ" uj p f uttqp" gpgti lkµ" g" gtµu" pµ" cµ" o gnepkng0 UK' i lpggt wgu" µ" gpgti lkµ" grgmtkng. "wtdkpcv" g" gtµu" lcpµ" µ" r k f j wtc" o g" f kuc" tllgv" grgmtkng0 Mµvq" tllgv" r µt huj k pµ" s cts gv" o g" dcvgtk' cr q" ukvgo gv' r µt" nqpuwo " xgv lcm" ukvgo gv" g" gpgti lkµ" pµ" uj nµµ" dcpko k" tllgv" r µt" xgpf gv" g" k qnwtc" qug" kuj w l" f j g" tllgv" g" o µf j c" µ" uj r µt p f ct lgu" µ" gpgti lkµ" grgmtkng0"

"



Hki wtc'80Vwtdkpcv'c+o g'uj v{µµ'r ter c'nqr cvcxg'f j g'd+o g'uj v{µµ'r ctc'nqr cvcxg'5"

"

Rµt' uc' k' r µtngv' pwo tk' vqcn "wtdkpcv" g" gtµu" s µ' i lgp f gp" o µ' uj r guj "lcpµ" pµ" µ" xµt vµ" o lch' µ" xqi n. " o g" ncr cekgv' 32" mY " cr q" o µ' r cn0 Rµt' uc' k' r µtngv' ncr cekgv' vqcn' i lgpgt wgu. "wtdkpcv" s µ' r µt dµl pµ" r lguµp" o µ' µ" o cf j g' µ" ncr cekgv' r µti lkj µukuj v' lcpµ" o lch' µ" o µf j c. " o g" ncr cekgv' r tgl' 30' f g tk' pµ" 7" O Y 0 Mµvq' wtdkpc' µ" o µf j c' r µt f qt gp" nt { gukuj v' pµ' tllgv" g" o µf j c" grgmtkng. " pµ' hkrko " nt { gukuj v' pµ' Gxtqr µ' f j g' Uj vgv' g' Dcu j mwtc' f j g' µ" hwpf o k' pµ' Mµµ' f j g' k p f k0 Vgm' wtdkpcv' o qf gtpg' µ" gtµu. " r tqeguk' k' uj p f uttko k' r µt" µ" cttkw" f g tk' vgm' gpgti lk" grgmtkng" dµj gv' r µto gu" hqteµu" vj go grqtg" cgtqf k pco kng" µ" µxk lgu' r µt" µ" r tqf j wct" gpgti lk' o gnepkng" ttqwmwug" pµ' plµ" dquj v' ttqwmwug' f j g" o µ' r cu' pµ' tcpu hqto k p" g" hµucl" gpgti lkg' pµ' cµ" grgmtkng' pµ' i lgpgtcvqt0"

³ https://www.researchgate.net/figure/Upwind-a-and-downwind-b-wind-turbines_fig3_307434882

Uqy.'mqll'k'o m'k| cnaupuj mo 'k'wtdkpu'u'o g'gtu'uj u'wtdkpc'o g'dquj v'j qtk qpvcn'hw'dquj v'kkt'qwmko k'
uj u'f ctecrn'o g'ukr'uthe's gp'g'vqmu'OTqvqv'u'g'wtdkpcxg'o g'dquj v'j qtk qpvcn'hw'dquj v'kkt'qwmko k'
ukr'cu'qt'k'gp'ko k'v'u'tqv'kt'v'f tgl'v'o 'v'u'gt'ju'qug'v'u'hwp'f ut'v'u'cl'+.'o qf grk'v'u'p {l'u'm'h'f'j gp'wtdkpcv'
o g'vg'j g'v'u'f tgl'v'f'j g'v'u'r'ut'mw'nc+. 'na'p'v'q'nk'v'u'tqv'kt'v'.p'wo tk'v'u'vg'j g'x'g'| cnaupuj v'f { "qug'v'g'vg'j g'+
f'j g'v'o mp {t'ju'ug'uk'cvq'lc'pu'u'r'q| k'ek'p'w'ctc'o g'gt'ju'p'*'v'wtdkpcv'o g'uj v'f'v'u'p' r' r'c'c'nr'cv'cxg'f'j g'v'o g'
uj v'f'v'u'p' r' c'te'nr'cv'cxg'+0'Hi w'c'8't'gi qp'p'f'ct'l'gp'g'wtdkpcxg'ukr'cu'qt'k'gp'ko k'v'u'tqv'kt'k'0"

"

P mpuk'vgo gv'nt { guqt'g'v'u'pl'u'wtdkpg'gt'g'*o g'dc| mp'pu'v'qmu+'o g'dquj v'j qtk qpvcn'l'cpu'v'gi wct'pu'
hki w't'ju'p'9.'nw'r'ut'hu'j k'j gv'<

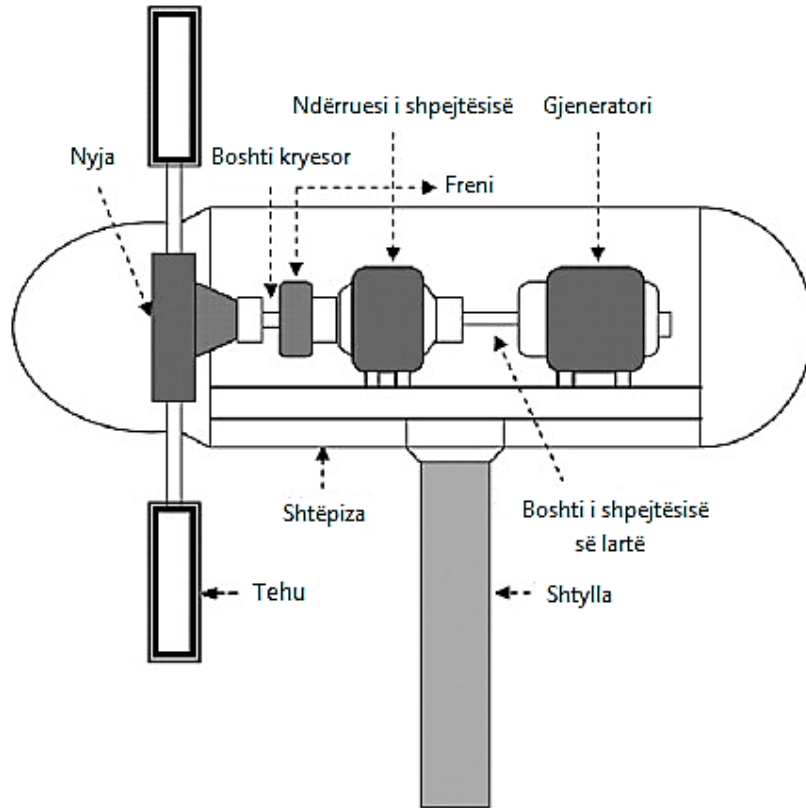
- o T'qv'kt's'u'r'ut'duj gv'p'i c'v'g'j g'v'cr'q'nr'cv'v'f'j g'p {l'u'r'ut'ht'ew'gug'0
- o Uk'vgo k'k'v'cpuo k'k'p'k's'u'r'ut'hu'j k'p'r'lg'u'v't'q'wm'v'gug'v'u'wtdkpu'u'v'u'gt'ju'p'v' ut'l'cuj v'ko 't'qv'kt'v'v'
s'u'r'ut'duj gv'p'i c'dquj v'g'v'p'f'ut'v'guk'v'u'uj r'gl'v'u'ku'p'. 'h'f'j l'g'v.'h't'gp'k'o g'nc'p'kn'f'j g'f' l'g'p'g't'cv'kt'k'0
- o U'j v'ur'k'c'g'wtdkpu'u'0
- o U'j v'f'm'f'j g'dc| co'gp'v'k'0
- o M'q'p'v'q'nk'k'o c'n'k'p'g't'ku'p'0
- o D'c'r'p'ek'k'uk'v'go k'v'g'rg'm't'k'm'f'v'ng'r'ut'hu'j k't'ju'v'm'ed'm'q'. 'r'cl'k'ul'g'v'g'rg'm't'k'ng. 'v'c'p'uh'q'to' cv'q't'v'f'j g'
n'a'p'x'g't'w'guk'g'o v'p'f'uj mo 'g'rg'm't'q'p'k'v'u'v'g'p'g't'i l'ku'p'0"

"

M'q'o r'q'p'g'p'v'v'nt { guqt'g'r'ut'f'k'cl'p'ko k'p'f'j g'n'a'p'v't'w'm'ko k'p'g'wtdkpcxg'v'u'gt'ju'p'l'cpu'<

- o P'wo tk'k'v'g'j g'x'g'*| cnaupuj v'f { "qug'v'g'v'="
- o Q't'k'gp'ko k'k't'qv'kt'v'v' r'c'tc"qug'r' r'c'c'uj v'f'v'u'="
- o O'cv'g't'kr'k'k'wtdkpcxg.'o g'v'q'f'c'g'n'a'p'v't'w'm'k'p'k'f'j g'r't'q'h'k'="
- o N'r'l'k'k'p {l'u'="
- o M'q'p'v'q'nk'="
- o O'qv'kt'k'o g'uj r'gl'v'u'k'h'k'm'g'c'r'q'v'u'p'f't' {uj'v'g'uj'o'g'="
- o Q't'k'gp'ko k'k'nr'cv'cxg'r'c'tc'c'r'q'r' r'c'c'uj v'f'v'u'p'u'wtdkpu'="
- o I l'g'p'g't'cv'kt'k'o g'k'p'f'w'm'k'q'p'c'r'q'o g'v'k'p'm't'q'p'k'ko'="
- o P'f'ut'v'guk'k'uj r'gl'v'u'ku'p'0

"



Hli wtc'90P μpukawgo gv'nt { guqtg'vu'wtdkpcxg'vu'gtmu⁶"

"

Tqvtk'

Tqvtk'f utdij gv'pi c'p {lc'f j g'hr cxcv'g'wtdkpu'vu'gtmu0M'vc'uj r guj 'nqpkf gtqj gp'vu'lgpu'r utdptuk' o μ'vu'tupf mukuj μo "vu'wtdkpu'uk'pi c'r gthqto cpec"cu j w'gf j g'pi c'r khr co lc" g'r μti lkj uj o g" g' nquvu0'

Uj wo lec" g'wtdkpcxg'uv'ncpu'tqvt'vu'gtmu'o g'v'g'hr cxc0Gm' kvqlpu'f kac'tqvtμ'o g'f { "hr cxc'r qt" lcpμ'vu'tcpμ'pf utuc'wtdkpcv'o g'plμ'hr cvu'lcpu'pf utwct'pμ'vu'ncvctup'f j g'o μ'pwnr tqf j qj gp0"

"

Uawgo kktcpuo ktkpk'

Rutdij gv'pi c'r lguv'g'vgtc'ttqwmwug'vu'wtdkpu'o g'gtμ0R'uthuj kpu'plμ'dquj v'o g'uj r glvuk'vu'wpu' *pμ" cpμp" g" tqvtk+:" pf uttwgukp" g" uj r glvukμ' f j g' plμ" dquj v'o g'uj r glvuk' vu' rctvu' *pμ" cpμp" g" i lpgtcvqtka0Mqo r qpgpv'vu'vgtμ'r μthuj kpu'hwuj kpgcv'o dμuj vgvuug.'plμ'qug'o μ'uj wo μ'dcu j mwgu." Itgpkp.'r lguv'ttqwmwug'vu'i lpgtcvqtka0S μnko k'k'pf uttwguk'vu'uj r glvukμ' μuj vu'vu'ttkμ'uj r glvukpμ"

⁴ <https://www.sciencedirect.com/topics/engineering/horizontal-axis-wind-turbine>

g"ttqwrko k'vu"tqvtk'pi c"plu"xrgtu"gvwv"*fj lgvte"tro +"pu"plu"uj r glvuk'vu"r mtuj wvuj o g'r mt" ftglvko kp"gvplu"i lgpgtcvtk'wcpfc" *kpf te"qug"o klute"tro +0'F ka"fk clpg"vu"wtlpcxg"o g'gtmu" r mtftkpi"i lgpgtcvtk'vu"uj wo vu"vj g"nuuj w'deuuj nuj gp"o g'plu"mwk'kpi teclj guj "o g'o mu"uj wo mu"ug" plu"duj vf chlglg0'Vu"vgtcv'r mtftkpi"i lgpgtcvtk'vu"r tqlgmwct. "r quc+mtkuj v'o g'uj r glvuk'vu"vuv'smu" pwnimntnqplpu"cuplu"pf mtwgu'uj r glvukg0"

"

I lgpgtcvtk'

Rqvj wclug"vu"i lkj c"wtlpcv"gvgtmu"r mtftkpi"qug"i lgpgtcvtk'kpf wmkmu"qug"ukpntqpu0'Muv"nqlg" r mtuj kpu"plu"uj r glvuk'ttqwrko k'npwv'vg"qug'r qvj wclug'npwv'vg"mw"i lgpgtcvtk'juj vu"krkfj vt" ftglvr mtftglv'pu"ttlgv"grgmtkn0'P uug"i lgpgtcvtk'r mtftqv'o g"nupxgtvkt'grgmtqpku"vu"gpgti lkpu." wtlpc'fq"vu"lgvu"pu"i lgpflg'vu"hwpmkqpqlu"o g'uj r glvuk'vu"pft{uj wguj o g0'

Uj wo mu"wtlpc"o g'gtmu"vu"kpvcwct"pu"er rknckppg"vu"rkfj vtc"pu"ttlgv'r mtftkpi"i lgpgtcvtk'vu" kpf wmkqpk'necl| k'k'ngvk⁷*f LKM"pu"cupi rkuj v'UEK "Vj g"us wktgr'eci g'kpf wvckp"i gpvtcvk+0' I LKM'qr gtp"dtgpfc"plu"fkerc| qpk'vu"pi wuj vu"uj r glvukuj "rcm'o mu"vu"rcv'u"ug"uj r glvuk"gvcl" ukpntq"*plu"i lgpgtcvtk'o g'nevtr'qng'smu"qr gtp'pu'plu"ttlgv'82'J | "fj g'nevplu"uj r glvuk'vu"ttqwrko k' r tgl'3: 22'tro +0'Rut cvtuku"nt {guqg'vu"mvkl'mqk'vu"i lgpgtcvtk'kpf wmkx'lcpu"ug"juj vu"krku"vj g'k' ngj vu"r mt'w'kfj vt'pu"ttlgv'grgmtkn0"

P lu"qr ukqp"i lkj plu"gv"o mu"qr wvnt'r mt'rtqfj ko kp"gvgpgti lkpu"grgmtkn"pu"uj nemu"vu"rcv'u"juj vu" wtlpc"gvgtmu"o g'uj r glvuk'vu" pft{uj wguj o g0' Gm kvqlpu"plu"pwo mt' r mthsko guj "sm"qhtqp" nqphk wtko k'k'ku."fvng'r mtuj ktu' xqi juo ko kp"gvnpuwo ko k'vu"wtlpc'pu"vu"gtmu"vj g'hwpmkqpko kp"gv o wpu'uj mu "vu"wtlpc'pu"o g'gtmu"o g'ghkneukg'v'o cmko cnr' mt'plu"fkerc| qp"vu"i lgtmu"vu"uj r glvukxg"vu" gtmu."fvng'fj mpu'r tqfj ko "o mu"vu"o cfj "gpgti lkpu0'

"

Uj v'ne'fj g'Vj go gik'

Mq'nevgi qtkr mtuj kpu'xgv'hwmp'cr q'uj v'npu'fj g'vj go grkp'o duuj vgyu0'Nqldvht {guqg'vu"fk clpk' vu"uj v'nu"sm" r mtftkpi" cmwckuj v'lcpu" nupwtwukqpk' xgv'knen'fvng" r mtftkvt" wdc" +grknw" nupwtwukqpgv'i tkrtg'fj g'uj v'ne'v'g"dgvpko0'Rut" wtlpc"o mu"vu"xqi m."r mtftkpi"uj v'ne"o mu"vu" vj lguj v'0'Ncvuk"gv"uj v'nu"juj vu"| cmupkuj v'3'f'gk'30'j gmu"o mu"gv"o cfj g"ug'fkco gvk'k'tqvtk0' \ i lgfj lc'g'hwmp'pftknqj gv'uj wo mu"pi c'netcmgtk'v'v'g'vqmu0'P i wvuk'cr q'xteclj f'ju"kv"gv"uj v'nu" juj vu"plu"hmqt"nt {guqt'pu"fkpc ko kpu"gv"ukugo k'vu"wtlpcxg"o g'gtmu"r mt'uj nem'vu"o wpu'juku"vu"

⁵ Për shkak të formës së kafazit të ketrit

r ctes klxg'v'f tkf j lxxg'o kf ku'tqvtk'f j g'mwmu'cr q'uj v{ muu'Rut 'wtdkpcv'o g'tqvtr'r ctc'uj v{ muu." f vj gv'v'o gttgv'r ctcu{ uj "ghmk'k'j klgu'pu'f kpcu knup'g'wtdkpuu."nwj cvlgv'g'gpgti lku'f j g'i lpgtko k'k' | j wto mu0"

Ukxgo k'k'Mqpv'qnk'

Ukxgo k'k'nqpv'qnk'r ut 'plu'wtdkpu'o g'gtu'uju v'k'tupf juukj mu "uk'r ut 'qr gko 'v'u'o ctkp'gt'ku'cu'j w' gf j g'r ut 'r tqf j ko 'v'u'gpgti lku'grgmtkn0M' 'ukxgo 'r ut huj ku'nao r qp'gpv'u'uk'pu'xc' j f ko <"

- o Ugp/qt mu'v'g'uj r gl'vuuku.'r q' l'ekp'k.'tt { o ko k'v'go r gtc'wtmu.'tt { o mu.'v'g'puk'p'k.'g'v'0"
- o Mqpv'qnt mu'v'g'o g'ncpk' o cxg'o g'ncpk'n's cts gxg'grgmtkn0"
- o Co r r'kk'nc'v'q' mu'v'g'gpgti lku'v'p'f ut r t'gt'juuk.'co r r'kk'nc'v'q' mu'grgmtkn'r qo r cv'j kf tcw'kn'g' f j g'xc'w'g'v'0"
- o Cmk'k'j w'guk'v'v'o qv'qt'v.'r ku'q'pcv.'o ci pgv'v'f j g'ug'rp'q'kf mu0"
- o K'v'g'ri l'g'pec'v'v'nao r l'w'gt'v.'o kn'qr t'q'g'uat'v'0"

Rt'ql'gmko k'k'ukxgo gxg'v'u'nqpv'qnk'r ut 'cr r'knko gv'g'wtdkpcxg'v'u'gt'uu'p'f l'gn'r t'cm'k'nc'v't'cf l'ek'p'c'g'v'u' k'p'z'j k'p'gt'ku'v'u'nqpv'qnk'0M'qpv'qnk'k'wtdkpuu'o g'gtu'r ut huj ku'v'g'cur g'm'g'v'nt { gu'qt'g'x'kl'w'g'ug'f j g' d'c'r'p'eko k'p'g'ctu{ gu'j mu 'v'u'n'p'ut'ng'uc'xg'v'u'v'f t'g'<"

- o X'gp'f'qulc'g'm'x'k'xg'v'u'uk' muo "f j g'm'x'k' ko k'k'o qo gp'v'v'f j g'h'w'v'ku'v'u'nt'kl'w'ct'0"
- o O cm'ko k' ko k'k' l'g'v'ui l'c'vuuku'v'u' t'qv'kt'v' f j g' r ut d'ut'mu'x'g'v'u' v'g'tu' ut w'w'wt'qt'v' pu' r t'cp'k'v'u' p'f t { uj ko gxg'v'u'f t'gl'v'ko k'v'u'gt'uu.'uj r gl'vuuku'f j g'wtd'w'g'p'e'ju'uk'f j g'ek'm'g'v'uv'ct'v'uv'qr "v'u' wtdkpuu'o g'gtu'0"
- o O cm'ko k' ko k'k'r tqf j ko k'v'u'gpgti lku'grgmtkn0"

D'c'r'p'eko k'k'Ukxgo k'G'grmt kni'

R'ut'x'g'±'i l'p'gt'c'v'q't'k.'ukxgo k'k'wtdkpcxg'o g'gtu'r ut f'qt'plu'p'wo ut 'g'ng'o gp'v'uju 'v'u'v'g'tu'grgmtkn0F'kuc' uj go dw'l'c'p'u'nc'd'm'v.'r c'kl'g'v'g'p'f ut r t'gt'l'gu.'v't'c'pu'ht'o c'v'qt'v.'n'q'p'x'g't'w'g'uk'v'grgmt'q'p'kn'u'v'u'gpgti lkuu." n'q'p'f'g'p'uc'v'q't'v'g'n'q'tt'ki l'ko k'v'u'h'c'm'q't'k'v'u'gpgti lku'0"

400 P'f'ct'lc'g'wtdkpcxg'v'u'gt'uu'

Ukxgo gv'g'uj ht { v'ul ko k'v'u'gpgti lku'v'u'gt'uu'p'f c'j gp'p'g'f { 'i t'w'r g'<"

10 Ukugo g's mu'ij ht {vu/qlpu'gpgti lkpu'g'gtmu'vu'ikfj wt 'pu'ttlgv'o g'plutk/vdgtkp0'

Ukr cu'vu'fj j upcxg'ucvuknqtg.'pu'hwpf 'vu'xkks'4225.'ttgyj '92' "g'uj ht { vu/ ko k'vu'gpgti lkpu'vu'gtmu'pu" o detu'dqyup'kr'utnkug'Gxtqr mu.'3: ' 'Co gtnpu'vu'Xgtkw'fj g': ' 'C| ku0' ¥ o ko k'r ut "dngtlgp" g"gpgti lkpu'grgmtkmu"vu'r tqf j wct"pi c"r utf qt ko k'k'gpgti lkpu'vu'gtmu'uj vu'70 " egpvmY j 'pu'I lgo cpkfj g'2039"&lmY j 'pu'Co gtnpu'g'Xgtkw0P mu'Gxtqr mu.'r ut'uj nem'vu'o wpi guuu" vu'j er mutcxg'dquj g'vu'o lchwguj o g'fj g'vu'f gpf mukmu'vu"o cfj g'vu'r qr wukmu."o mu'vgr ut'r utf qtgp" wtdkpc.'hws k"vqvcg'pu'ttlgv'g'vu'ekcxg'uj nqp" f gk'pu"42/72'O Y 0' P f utuc"pu'Co gtnpu'g'Xgtkw."pwn'gn' kuqlpu'nuvq'r gpi guc" f j g'hws k"vqvcg'pu'ttlgv'g'wtdkpcxg" uj nqp"pi c'72'O Y "o'422'O Y 0' "



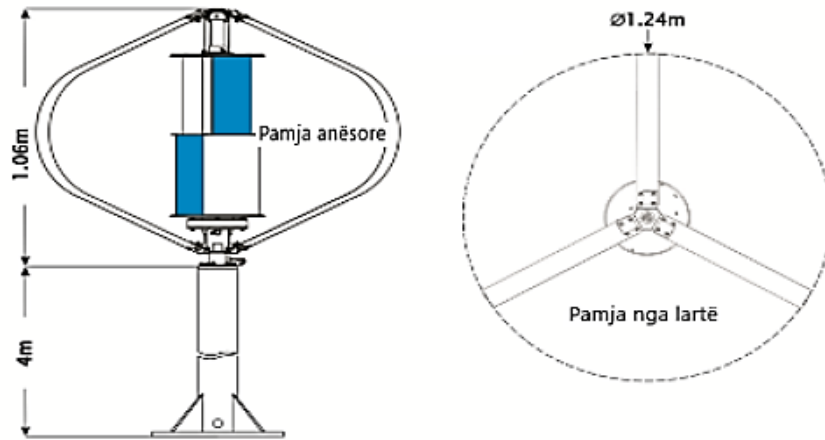
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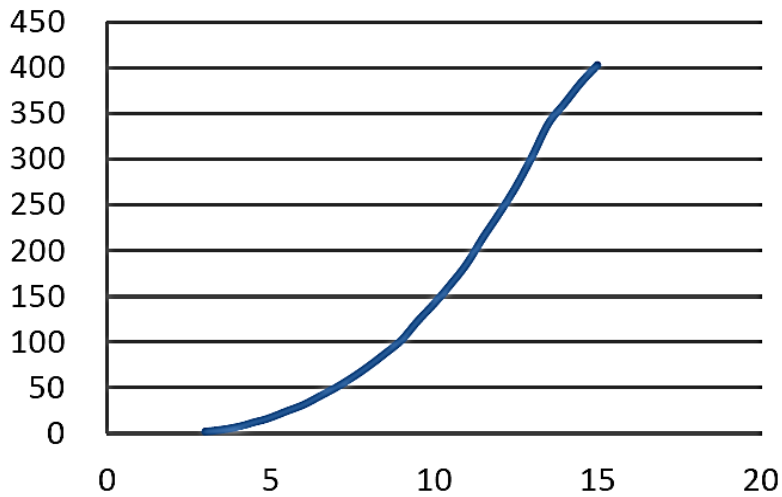
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10 Ukugo g's mu'xctgp'ht {gukuj v'pi c'tgl kuvpec'cgtqf kpc'o kng'g'cltk0Muvq'ncpu'nqghkelpv'hws kg" vgr ut'vu'xqi mu'o cmuko wo k'k'vu'ekrk'o gtt'xrgtup"2080'



Hki wtc'320Vwtdkpc'F cttkgwu"

Fuqia (W)



Shpejtësia e erës (m/s)

Hki wtc'330I tchkmw'k'xctmu'ku'p'u'hwsk'u'p'u'wtdkpc'x'g'o'g'cmu'x'gtvkn'p'i c'uj r gl'vuk'g'gtmu"

❖ U'k'cu'x'g'p'f'p'f'q'f'j'lg'u'p'u'k'p'u'c'v'k'o'k'v'u'v'f'g'f'cm'j'gp'<

KO Vwtdkpc'v'g'gtmu'p'u'qmu'w'ki wtc'34'/c0"

KO Vwtdkpc'v'g'gtmu'p'u'f'gv'w'ki wtc'34'/d0"



c+.....d+

Hki wtc'340Vwtdkpcv'g'gtmu'vu'xgpf quwtc'pu'vqnu'f j g'f gv'

"

❖ Ukr cu'hws kuu'vu'kpuvncwt'xg+qj gp<

Ю Vwtdkpcv'g'xqi rc"vu'gtmu'/"o g'nrc cekgv'vu'kpuvncwt'r tgl"3/32"mY "sμ'r μtf qtgp"pu'uj vvr k" hgtc c'cr q'r μt'o dwuj lgp"g'cmwo wrcvtμxg00 wpf "vu'r μtf qtgp"gf j g'pu'xgpf g'vu'rci μv'f j g' vu'k' qnwtc'pi c'ttlgvkr' wdrknk'gpgti lku'gngmtknq0'

"

Ю Vwtdkpcv'g"o guo g"vu'gtmu'/"o g'nrc cekgv'vu'kpuvncwt"pu"o gu"vu"32/722"mY 0'M{ "mqj"K' wtdkpcxg.'uj r guj 'juj vu'k'rkf j wt'o g'ttlgvk'p'gngmtkn's qhvu'kpf kxf wcrkuj v'qug'pu'i twr 00 wpf " vu'r μtf qtgp'r μt'hwtpk ko "vu'plu'hqncckqpk'vu'ecmwct'r Qij 0huj cvk'o cpf gl'r μt'ukugo g'j kdtkf g' pu'nqo dkpko "o g'dwtko g'vgtc'gpgti lgvknq0'

"

Ю Vwtdkpcv'g"o μf j c"vu'gtmu'/"o g'nrc cekgv'vu'kpuvncwtc"o dk'722"mY 0'Mμvq"nt { gukuj v'lcpμ'vu' kpuvncwtc'pu'i twr g'vu'wtdkpcxg"o g'gtμ* r cts g'vu'wtdkpcxg"o g'gtμ+ "vu'p'f μtrkf j wtc'pu"o gu' xgvkf j g'xgr tqplμ'uk'plμ'uxcekq'kr tqf j ko k'vu'gpgti lku'gngmtknq0'

"

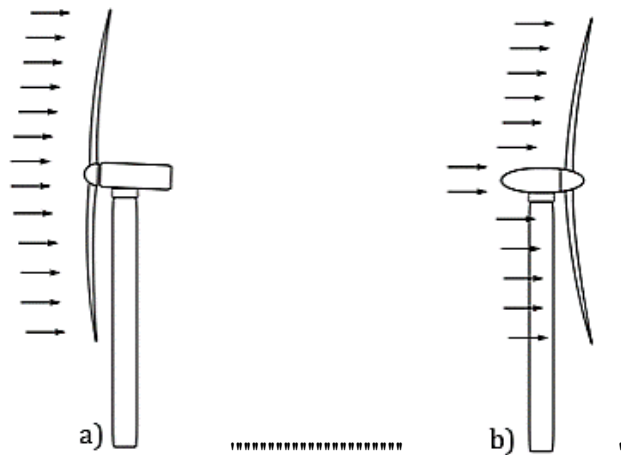
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"

4080 Vwtdkpcv'g'gtmu'b g'dquj v'j qtk qpvrn"

Ttgj "; ; ' vu'wtdkpcxg'vu'gtmu'vu'ekrv'r μtf qtgp"pu'f kvu'g'uqvo g'lcpμ'wtdkpc"o g'dquj v'j qtk qpvrn0' lcpμ'f { "mqj"vu'wtdkpcxg'vu'gtmu"o g'dquj v'j qtk qpvrn<P lwtc'juj vu"o g'uj v{μu'r ctc"nqr cvcxg"hi 0" 35.'c+pf μtuc'vgtc'juj vu"o g'uj v{μu'r tcr c'hqr cvcxg0Gf j g'r ug'pu'r etko 'o wpf "vu'r μtf qtgp'vu'f { "μvq"

mqlg'vg'wtdkpcxg.'mqllkr'utf'qtw'o'μ'uj' r' guj' v'k'uj' v'k'ev' t'g'o' g'uj' v'μ'v'x'gpf' quw'r' ter' c'qr' c'v'x'g'
 *hi 0'35.'d+0P' lμ'pi' c'ctu' {gv'g'r' utf' qtko' k'v'μ'v'k'v' l'mqll'v'wtdkpcxg'μ'uj' v'v'wtdw'gpec'g'gt'μ'g'ekc'
 ntklqj' g'v't'g'v' 'uj' v'μ'v'nc'p'f' kko' 'o' g'v'x'qi' μ'p'μ'qr' c'v'v'g't'q'v'k'v'wtdk'p'μ'.'nt'c'j' cuw'et'o' g'wtdk'p'c'v'
 o' g'uj' v'μ'v' r' c'te'qr' c'v'x'g'o'



Hi' wtc'350'Vwtdk'p'c'v'g'gt'μ'c'+o' g't'q'v'q't' r' c'te'uj' v'μ'v'f'j' g'd+'o' g't'q'v'q't'o' d'ter' c'uj' v'μ'v'

"

Vwtdk'p'c'v'g'gt'μ'o' g'd'q'uj' v'j' qtk' qp'v'c'n'l'c'p'μ'mq'lg'v'o' g'v'μ'r' μ'j' er' wtc'r' μ't' h'ws' k'v'μ'o' μ'f'j' c'00' μ'r' qu'j' v'μ'l'c'p'μ'
 v'μ't'g'p'f' kw't' f' kuc'p'i' c'r' μ't'r' c't'μ'k'v'μ'f'j' g'f' qd'μ'k'v'μ'g'μ'v'k'v' l'mqll'v'wtdk'p'c'x'g'v'g'gt'μ'o'

- R'μ't'r' c't'μ'k'v'μ'g'wtdk'p'c'x'g'o' g'd'q'uj' v'j' qtk' qp'v'c'n'
 - ✓ l'c'p'μ'p'μ'i' l'g'p'f' l'g'v'μ'uj' h't' { v'μ' q'l'p'μ'o' k'μ'uj' r' g'l'v'μ'k'v'μ'g'o' μ'f'j' c'v'μ'gt'μ'p'μ'r'c't'v'μ'k'v'μ'o' μ'f'j' c.'"
 - ✓ Gh'k'g'p'ec'g'v' t'g'μ'uj' v'μ'r' c'n'lo' g'g'o' k'μ'ug'g'wtdk'p'c'x'g'o' g'd'q'uj' v'x'g't'v'k'n'c'n'"
 - ✓ O' w'p'f' μ'k'c'g'p'f' t' { u'j' k'o' k'v'μ'μ'p'f' k'v'μ'qr' c'v'μ'v'μ'μ'v'q'wtdk'p'c'g't't'k'v' gh'k'g'p'ec'μ'p'f'j' g'ng'j' v'μ'q'p'p'
 t't'g'i' w'n'ko' k'p'g'uj' r' g'l'v'μ'k'v'μ'o'

- V'μ'o' g'v'c'v'
 - ✓ ¥'o' k'o' k'k'r'c't'v'μ'k'd'r'g't'l'g'u'r' μ't' r'c't'v'μ'k'v'μ'o' μ'f'j' c.'"
 - ✓ O' w'p'f' μ'k'c'g'f' t'k'f'j' l'g'x'g'i' l'c'v'μ'r' v'p'μ'μ.'"
 - ✓ O' k'μ'o' d'c'l'v'c'o' μ'g'x'μ'uj' v'k'μ'w'c't'o'

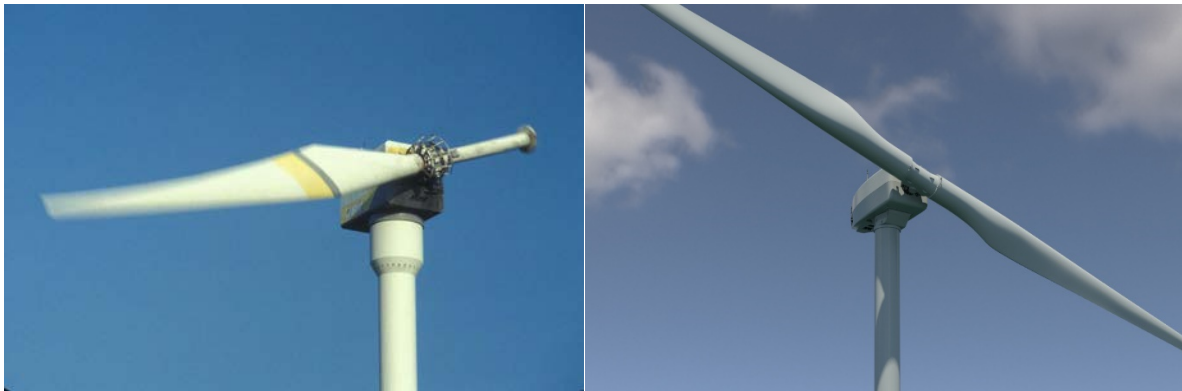
"

P'wo' t'k'k'l'qr' c'v'x'g'v'μ'wtdk'p'c'v'o' g'd'q'uj' v'j' qtk' qp'v'c'n'

P'wo' t'k'k'l'qr' c'v'x'g'v'μ'wtdk'p'c'v'o' g'd'q'uj' v'j' qtk' qp'v'c'n'nc'p'l'μ'p'f' kko' "v'μ'o' c'f'j' "p'μ'nc't'c'm'g't'k'v'k'n'c'v'g'v' t'g'o'
 Vwtdk'p'c'v'o' g'd'q'uj' v'j' qtk' qp'v'c'n'o' w'p'f' v'μ'l'g'p'μ'o' g'p'l'μ'qr' c'v'μ' f' { 'qr' c'v' *hi' wtc'36+'v'g'g'qr' c'v'f'j' g'o' g'

uj wo μ'nr cve "hki wtc "37-0'Vwdkpcv'g" | cnpuj o g'o g'vk'nr cve "plkj gp "uk'Mqpegr vk'mcukni'F cpgl 0' Vwdkpcxg'o g'f { "nr cve. "w'pgxqlkxv'uj r glvuk'o g'g'o cf j g"gtμ'r μt "v'ntklwct "ucukpμ" g'plμv'v'μ" gpgti lkμ'v'ekμp "g'ntklqμ'vwdkpcv'o g'vk'nr cve 0'Rexctμukuj v'ntuko k'r μt "uj neni'v'pwo tk'o g'v'μ" xqi μn'v'nr cve xg. "nq "vwdkμ'pwn'μuj v'v'gi wct "uj wo μ'g'o kμ 0'Vwdkpcv'o g'pwo μt "o g'v'μ'o cf j "v'μ" nr cve xg'cr q'vwdkpcv'Co g'kncpg. 'r μtf q'g'v'pμ'hgto c'r μt 'r qo r cv'g'vks 0'Uj r glvuk'g'ttqwnko k'μuj v'μ' g'xqi μn 0'Mcpμ'o qo gp'v'μ'o cf j "v'μxk lgu'r qt 'plμ'ghk'gpeμ'r μti lkj μukuj v'v'xqi μn 0'

"



Hki wtc "360'Vwdkpcv'g'gtμ'o g'plμ'nr cve'f j g'f { "nr cve ""

"



Hki wtc "370'Vwdkpcv'g'gtμ'o g'v'g'nr cve'f j g'uj wo μ'nr cve ""

"

"

40040 Vwdkpcv'g'gtμ'o b'g'dquj v'xgt v'nc'rl'

"

Mμv'v'vwdkpc'pwn'lcμ'uj wo g'v'μ'pf t { uj o g'pi c"cvq"o g'dquj v'j qtk qpvcn'uc "K'r μtngv'r ctlo k'v'μ" qr g'klo kv. 'r μtxg±'dquj vk'nt { guqt "v'μ'tqvtk's μ'μuj v'μ'k'o qpwct "xgt v'nc'rkuj v'0'Vg"n' "mql" k'vwdkpcxg"

uj v{mc'g'ucl'juj vu'b mu'r emlg'pi ctmwct'bg'vg'wtdkpcv'o g'dquj v'j qtk qpvcno' gs mu'pf uttwgukkluj r glvuukmu." i lpggtcvqtk'f j g'v'cpuhqto cvqtk'xgpf qugp'chut'dc| co gpvk'vu'uj v{muu'*pu'muo du'vu'uj v{muu+0' Cmwenluj v'wtdkpcv'o g'dquj v'xgtvknen'r utf qtgp'pu'o cuup'r tgl'ttgj '3' 0'

Muvq'wtdkpc'pf cj gp'pu<

- Vwdkpc'F cttlgwu."
- Vwdkpc'Ucxqpkwu."
- Vwdkpc'vu'hqo dkwctc."mqll'F cttlgwuóUcxqpkwu"

"
"

4040Gpgti lkc'vgqt kng'g'gt ju'

Dwtko k'k'gppti lku"grgmtkng"vu'r tqf j wct"pi c"wtkpc" g"gtmu'juj vu"gppti lkc"nkp'gkng" g"gtmu" g"ekc" uj pf uttqj gv'pu'gppti lk'o gncp'kng'vu'ttqwnko k'vu'tqvqtk'vu'wtdkpuu0Rut'uj ht {vu| ko kp'f j g'hqi ctkl'gp" g"gtmu'uk'dwtko 'k'gppti lku'f vj gv'o gttgp'r ctcu{uj 'hcmqtuv'xklwgu<

- Mko c'f j g'netcmgtkuknev'hk kng'vu'ucl."
- Uj r glvuuk'o gucvctg'g'gtmu."
- Ukr mthcs lc'mw'f q'vu'xgpf qugp'wtdkpcv."
- F kucpec" g'pgxqluj o g'pf mto lgv'wtdkpcxg'vu'gtmu'r Qij 0'pu'tcuv'g'r cts gxg'vu'gtmu."
- Vgnpqmi lkc'g'r utf qtwt'r ut'r tqf j ko kp'g'gppti lku"grgmtkng0'

"

Gppti lkc"nkp'gkng" g"gtmu'v'cpuhqto qj gv'pu'gppti lk'ttqwnwug'vu'tqvqtk'vu'wtdkpuu'vu'gtmu'f j g'nlq" r cucl'pur mto lgv'i lpggtcvqtk'uj pf uttqj gv'pu'gppti lk'grgmtkng0Hws kc'vgqt'kng'pu'f kur q| kekqp" g"gtmu" r cts gv'gppti lk'pu'nkp'gkng'vu'o cuuu'vu'cltk'g'ekc" g'r mutj nqj'tqvqtk'g'wtdkpuu'vu'gtmu'pu'pl'vuuk'vu" nqj ju0Xrte'g'ucl'o wpf 'vu'pl'gj uqj gv'pi c'uj r tgi lc<

$$R_v = \frac{3}{4} \cdot \rho \cdot A \cdot x^5 \dots\dots\dots *3+''$$

mw'juj vu<

R_v'''hws kc'vgqt'kng" g"gtmu'pu'Xcv*Y +."

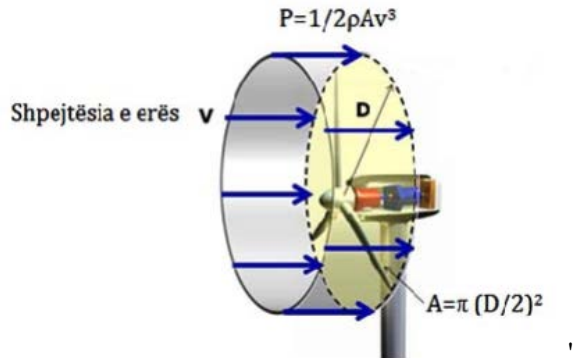
rho'''f gpf vuuk'g'cltk'pu'*mi lo 5+. 's mu'juj vu'r mchutukuj v'3047'mi lo 5.'''

C'o'ukr mthcs lc'g'tqvqtk'vu'wtdkpuu'o g'gtmu'pu'*o 4+."

x'o'uj r glvuuk'g'gtmu'*o lu+0'

"

Pi c'detc| ko k*3+. 'uj kj gv'ug'hws lc" R, 'ujj vu'pu'r tqr qtekqp "vu'f tglvu'o g'uj r glvuukpu" g'gtmu'pu'uj ncmup" g"tgvu'f j g'o g'ukr mthcs gp"C "vu'tqvtk'vu" wtdkpu0Rtc. "hws lc"o cmko crg"pu'f kur q| kekqp'xctgv'pi c" ukr mthcs lc" g"tqvtk'vu" wtdkpu"o g"gtmu'f j g'uj r glvuukpu"vu" g'gtmu'P mu" hki vtup" 38" uuj vu" r ctes kw" ukr mthcs lc" ghgmkg'g"tqvtk'g"gmur q| wct'pf cl"gtmu0

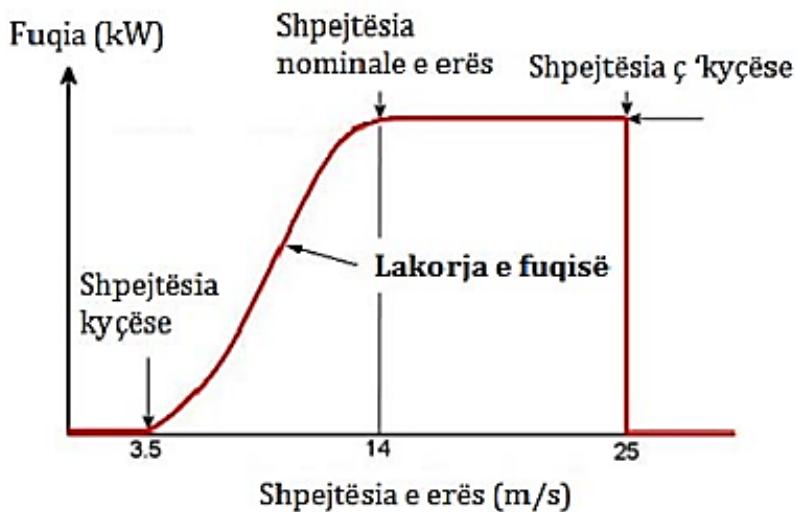


Hki wtc"380Ukr mthcs lc" ghgmkg'g"o qvtk'

"
"

4050 Ncmqt lc'g'hws ku'f j g'xct juke'pi c'uj r glvuuk'g'gtmu'

Ncmqt lc" g'hws ku" hki wtc"39+ "uuj vu" i tchkw" "k'ekk'vt gi qp" gpgti lkpu" s mu" lgr "plu" wtdkpg" g'gtmu" r mu" uj r glvuuk'vu'pf t { uj o g'vu"gtmu0Vwtdkpcv'g'gtmu'lcpu"vu'f k' clpwctc"cuqal" s mu"vu" hmq lpu"vu" r wq lpu'pu" uj r glvuukpu" g'gtmu'pu"o gu'vu"5'f j g'7"o lu0Rq"cu j w'wtdkpc' uuj vu" g'f k' clpwct' s mu"vu'pf crgv'vu" r wpwctk' pu'uj r glvuukvu'g"o mf j c'vu'gtmu"ttgvj '47"o lu+. s mu'vu"o qu'xklg'f g'vk'vu'pf qplu'f mu"o vko 'r mu'xgvu'wtdkpu" f j g"o lgf kkp'mw' uuj vu'xgpf quwt'wtdkpc0



Hki wtc"390Ncmqt lc'g'hws ku'vu'wtdkpu"vu'gtmu'

"

Pi c'rcnqtlc'xg±qj gp'uj r glvaukμ<

- Uj r glvauk "g'nf ±gu<Mlq'juj v'uj r glvauk'g'gtμu'pμ'v'ekrup'wtdkpc'hknp'v'r tqf j qlμ'gpgti lk' grgmtkng0Mlq'uj r glvauk' cnapkuj v'juj v'r tgl'5'f gt'k'pμ'7'o lu<
- Uj r glvauk "pqo kpcrg'g'gtμu<Mlq'juj v'uj r glvauk'o g'g'wμv'pμ'v'ekrup'wtdkpc'cttkp'v'lcr " xrgtμp'g'uc'l'pqo kpcrg'v'r tqf j kō k'v'μ'gpgti lkμ'grgmtkng0O dk'hμv'uj r glvauk'tgl' wncv'v'o g' v'hetv'lc'pμ'v'o wpf uj o g.'r qt'tqvtk'juj v'k'hnpv'qmwct'r μt'v'μ'o dclwt'pμ'hws k'hnpuc'pvg' r μt'v'μ'wtk' wct'pi ctngup'f j g'r tgukqkp'o dk'hq'cvc<
- Uj r glvauk "g'uj nf ±gu<Mlq'juj v'uj r glvauk'o g'g'o cf j g'g'gtμu'pμ'v'ekrup'wtdkpc'o wpf "v'μ' qr gtql0'O dk'hμv'uj r glvauk'wtdkpc'pwm'f q'v'r wqqlμ.'f q'v'μ'pf c'rg'v'r μt'v'μ'r c'c'p'f c'wct' f μo vko gv'g'wtdkμu'cr q'o l'gf kuk't'g'v' wgu0'

"

"

4060 Ghk'gpec'g'wtdkpcxg'v'gtμu'

Ghk'gpec'g'wtdkpcxg'v'gtμu'η'o wpf "v'f ghk'qj gv'ukt'cr qt'v'p'f μto l'gv'gpgti lkμ'grgmtkng'v'r tqf j wct' f j g'gpgti lkμ'nkpgv'kng'v'gtμu'g'gpgti lkμ'f kur qpwgug'v'gtμu'0Ml' "t'cr qt'v'xct'gv'pμ't'gp'f "v'r ctμ'pi c' ghk'gpec'g'napxgt'vko k'v'μ'gpgti lkμ'v'gtμu'pμ'gpgti lk'o g'nc'p'kng'v'tt'q'w'rkō k'v'μ'tqvtk'r'tc'pi c' ghk'gpec'g'tqvtk'qug'v'j μpμ'p'f t' {uj g'pi c' ghk'gpec'g'cgt'q'f k'pco kng'g'wtdkμu'v'gtμu'0'Vgqtk'c'g' r μtec'v'kō k'v'μ'ghk'gpeu'cgt'q'f k'pco kng'v'wtdkμu'juj v'μ' j xk'wct'pi c'h'k' k'nc'p'k'i l'gto cp'c'nd'gt'v'Dg'v' " *3: : 7/3; 8: +k'ekc'nc'i l'gwt's'μ'gpgti lk'o c'v'kō c'rg'g'ekc'o wpf "r μthk'qj gv'uk'gpgti lk'tt'q'w'w'v'gug'g' dquj v'k'pμ'v'ek'p'juj v'k'h'wct'tqvtk'juj v'3849'qug'7; " "g'xrgtμu'v'gpgti lkμ'nkpgv'kng' f kur qpwgug'v'gtμu'0'Rt'c'p'f cl.'hws k'o c'v'kō c'rg'v'g'qtkng'g'tt'q'w'rkō k'v'μ'dquj v'k'v'wtdkμu'v'gtμu.' uk'cu'Dg'v' /k'v'o wpf "v'h'nc'w'w'qj gv'pi c'uj r t'g'i lc<

$$R_{t.o.cz} = \frac{38}{49} \cdot \frac{3}{4} \cdot \rho \cdot A \cdot x^5 \dots\dots\dots *4+$$

Hws k'tgcrg'g'tt'q'w'rkō k'v'μ'dquj v'k'juj v'μ'o μ'g'xqi μn'ug'cl'q'v'g'qtkng'r μt'uj n'nc'v'μ'j wo dl'gx'g' cgt'q'f k'pco kng'pμ'hq'rc'v'g'tqvtk'0T'cr qt'v'p'f μto l'gv'hws kμ'tgcrg'v'tt'q'w'rkō k'v'μ'dquj v'k'v'wtdkμu' o g'gtμ'Rt' f j g'hws kμ'v'g'qtkng'v'gtμu's'v'j gv'n'g'h'k'p'v'k'hws kμ'tqvtk'qug'ghk'gpec'cgt'q'f k'pco kng'g' wtdkμu'0'

$$E_r = \eta_{cgtq} = \frac{R_t}{R_v} \dots\dots\dots *5+$$

Mqghlekpvk'o cmuko cn'k'hws kuu'cttkj gv'r ut "hws kpu"o cmuko crg'pu'f kur q| kekqp"ukr cu"Dgv| /k'f j g"ne" xrgtup<

$$E_{R_{ocz}} = \frac{R_{t.ocz}}{R_v} = \frac{38}{49} = 207; 5 \text{*6+}$$

Rtc'xrgtc'g'hqghlekpvk'vu'hws kuu'ut'qvtkv'pu'tcukp'vgqtknljuj vu'ttgjy '82" OP mu'r tcmknu.'r ut'uj neml' vu'j wo dlxg'cgtqf kpcu kng.'xrgtc'g'nuvk'l'hqghlekpvk'juj vu'o mu'g'xqi mu'f j g'r ut'mwuj vgv'qr vko crg'vu' r wpuu'vg'wtdkpcv'o qf gtpg'ukngv'ttgjy '2069'r ut'ne'vuukuj v'ttgjy '69" '0

Ghkegpec"cgqf kpcu kng'tghngmqj"j wo dlgv'cgtqf kpcu kng'pu'tqvtkv"g"wtdkpuu'f j g"nuvq"j wo dlgv' pcv'tkuj v'tghngmqj gp"gf j g"pu"| xqi urko kp"g"gpgti lkuu'vu'r tqf j wct'grgmtkng"pi c"wtdkpc"o g"gtmu' O kmu q.'r ut'xg±'j wo dlxg'cgtqf kpcu kng.'ucuk'g"gpgti lkuu'grgmtkng'pu'f crlg'vu'wtdkpuu'xctgv'gf j g" pi c"j wo dlgv'o gncpkng"pu'ukngo kp"g"tcpuo gvko kv'vu'hws kuu'pi c"duj vk'k'tqvtkv'pu'duj vkp"g" i lpgtvcvtkv'f j g'pi c"j wo dlgv'grgmtkng'pu'xg'vu' i lpgtvcvtkv'g"gpgti lkuu'grgmtkng'OI lcvu'hemwiko kv' vu'ghkegpejuu'vu'wtdkpcxg'vu'gtmu."j wo dlgv'o gncpkng"o gttgp'pu'nuvkf gtcvu'pvr mto lgv'ghkegpejuu' o gncpkng"η_{o gm}."xrgtc'g'vu'ekuu'ukngv'pf mto lgv'; 8/; ; " OP i lcujuo ."j wo dlgv'grgmtkng"o gttgp'pu' nuvkf gtko 'pvr mto lgv'ghkegpejuu'grgmtkng"η_{gn}."xrgtc'g'vu'ekuu'ukngv'pf mto lgv'; 8/; 9" '0

Ghkegpec"g"wtdkpcxg"vu'gtmu."r tc'tcr qt'vk'pf mto lgv'gpgti lkuu'grgmtkng"vu'r tqf j wct'f j g"gpgti lkuu' nkvkng"vu'gtmu"o wpf "vu'plgj uqj gv'uk'r tqf j ko "pf mto lgv'ghkegpejuu'cgqf kpcu kng."ghkegpejuu' o gncpkng'f j g'ghkegpejuu'grgmtkng'vu'wtdkpuu<

$$\eta = \eta_{cgtq} \cdot \eta_{o gm} \cdot \eta_{gn} \text{*7+}$$

Xrgtjuo kkr'qvpekerk'vu'r tqf j ko kv'vu'gpgti lkuu'grgmtkng"pi c"wtdkpcv'uj r guj j gtu'duj gv'pu'dc| mu'vu' hws kuu'pgo kpcrg'vu'wtdkpcxg'vu'gtmu'0Hws kc'pgo kpcrg'g"wtdkpcxg'vu'gtmu'juj vu'hws kc'g'hemwact'r ut' uj r glvuuk'pgo kpcrg'vu'gtmu'OP mu'cpu'vlgvut'uj r glvuuk'pgo kpcrg'g"gtmu'juj vu'uj r glvuuk'r ut'vu'ekup" i lpgtvcvtkv'wtdkpuu'juj vu'pu'i lgpflg'vu'cttkl'hws kpu"o cmuko crg'f j g'xctjuukuj v'pi c'mqk'k'wtdkpuu' ukngv'pf mto lgv'33/38"o lu'OP mu'tcukp'mw'f kj gv'ghkegpec"g"wtdkpcxg'vu'gtmu."hws kc'pgo kpcrg'g" wtdkpuu'vu'gtmu"R_{pg}"o wpf "vu'hemwuj gv'pi c'uj r tgj lc<

$$R_{pg} = \eta \cdot R_v = \frac{3}{4} \cdot \eta \cdot \rho \cdot A \cdot x^5 \text{*8+}$$

Hws kc'pgo kpcrg'g"wtdkpcxg"vu'gtmu'juj vu'r ctco gvut'k'tupf juukuj muo "r ut' xrgtjuo kp"g'hws kuu' r ut'ne'vuukuj v'gpgti lkuu'grgmtkng's mu' wpf "vu'r tqf j qj gv'o cmuko crkuj v'pi c'wtdkpcv'f j g'cvu'pu'tcukp" mw'pu'nuvkqpkp"g'ecnwact'uj r glvuuk'g"gtmu'k'r uti lki lgv'uj r glvuuk'pgo kpcrg'0O kmu q'xrgtjuo k'

o μ"o gtkqt"r μt"fqdkpμ"g"kpucvko k'vμ'r ctmw'o g"gtμ."o wpf "vμ"duj gv"pμug"f kj gv"ucuk"xlgvqtg"g"
 gpgti lkμ"grnmtkng"s μ"o wpf "vμ'r tqf j qj gv"pi c"ck'r ctn0P μ"cpμp"vlgvμt"ucuk"xlgvqtg"g"gpgti lkμ"uμ"
 r tqf j wct" pwn' xctgv' xgvμo " pi c" r gthqto cpec" vgnpkng" g" wtdkpcxg" r qt" gf j g" pi c" mwuj vgv'
 o gvgqtqmqi lknq'tgur gmkkuj v'pi c'tgi lko kkt {o ko k'vμ'gtμu'i lc vμ'vμtμ'xkk0Rμt'ημvμ"ctu{g."xrgtμko "
 r tcmkn'k'r gthqto cpeμu"uμ"wtdkpcxg"vμ'gtμu"| cμqpkuj v'duj gv'pμr μto lgv"vμ"cuw wclwtk'hcmqt"K"
 gpgti lkμ"uμ"r tqf j wct" vμ"plqj wt" pft {uj g" gf j g" uk'hcmqtK'K'nεr cekgvk' *h0' HcmqtK'K'nεr cekgvk'
 r μtncvμukuj v'hcmqtK'K'gpgti lkμ"uμ"r tqf j wct"r ctes gv'ter qtvk"pfto lgv'gpgti lkμ"uμ"r tqf j wct"i lc vμ"
 plμ'xkk'G_r "f j g"gpgti lkμ"o cmko cng's μ"fq"vμ"o wpf "vμ'r tqf j qj gl'i lc vμ"cvk'xkk'G_{r o cz} <

$$h = \frac{G_r}{G_{r \text{ o cz}}} = \frac{G_r}{R_{pog}} = \frac{G_r}{R_{pog} \cdot 587 \text{ fkm} \cdot 46 \text{ qt} \mu} \dots\dots\dots\%9+''$$

F wng'r cuwt'r etcu{uj "ug'uj r glvμuk"g"gtμ'i lc vμ'xkk'pμ'uj wo kεpμ"g'hqj μu'juj vμ'f wμuj μo "o μ'g'xqi μn'
 ug'uj r glvμuk"pqo kpcng."gpgti lk"g"xlgvqtg"g"r tqf j wct"fq"vμ"lgvμ"o μ"g'xqi μn'ug"gpgti lk"s μ"fq"vμ"
 o wpf "vμ'r tqf j qj gl'ukmwt'i lc vμ'vμtμ'hqj μu'juj r glvμuk"g"gtμu'vμ'hkuj v'xrgtμp"g'xgv'pqo kpcng0Rμt'ημvμ"
 ctu{g"xrgtc"g'hcmqtK'vμ"gpgti lkμ"uμ"r tqf j wct"} cμqpkuj v'ukngv'pfto lgv'42'f j g'62' "J5Q_0Xrgtc"g"
 hcmqtK'vμ"gpgti lkμ"uμ"r tqf j wct"pi c"wtdkpcv'g"gtμu."pμ'Mquqxμ'xrgtμuqj gv'ug'juj vμ'47' 0'

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50 CGTQFIP CO KMC'G'VWTDIP CXG'V^ 'GT^ U'

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Vwtdkpc" g'gtmu'ukε'g'ngo k'egmwt'g'dup"uj pf uttko kp" g'gpgti lkμ' nkp g'vkn'g'vμ'gtmu'pμ'gpgti lk'o gncpkn'g' pμ'dquj v'f j g'r μthw'pf ko kuj v'pμ'gpgti lk'grgmtkn'g'pμ' i lpgtvcqt0Hws kc"o cmuko cng'pμ'f kur q| kekqp." Rocz."o w'pf "v' h'sqj gv'pμug'vgqt'kkn'kuj v'uj r gl'vauk" g'gtmu'vμ'tgf wmqj gl'pμ' | gtq<

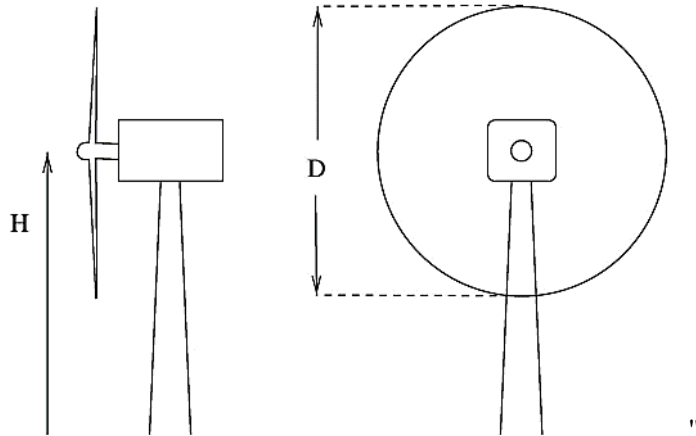
$$R_{ocz} = \frac{3}{4} \dot{o} x^4 = \frac{3}{4} \rho Cx^5 \quad " \quad " \quad " \quad " \quad * : +"$$

mw'o μuj vμ'r twlc'pμ'o cu'r μto gu'tqvtk: "X_q uj r gl'vauk" g'gtmu." ρ f g'pμk" g'gtmu'f j g'C" uk' μth's lc" pμ'vμ'ekpμ'uj r gl'vauk" g'gtmu'μuj vμ'tgf wmwct0Gmxc'kqpk'r μt' h's kμ'o cmuko cng'pμ'f kur q| kekqp' μuj vμ' uj wo μ'k'tupf μukuj μo "r cuk's μ'tgi qp"ug' h's kc"ttk'gv'o g'mwdk" g'uj r gl'vaukμ'vμ'gtmu'f j g'nk'p'gt'ctkuj v' o g'f g'pμkμ'f j g'uk' μth's gp0'Rt'c'p'cl. "uj r gl'vauk" g'f kur qp'w'g'uj o g'g'gtmu'pμ'plμ'x'gp'f "vμ'ecmwct" uj r guj "o cvg'v'h'kko kuj v'i lc'vμ'plμ'r g'kwf j g'μuj g'r μtr ctc'ug'vμ'h'kμ'ljμ'r tq'lgm'k0

P μ'r tcmkμ'uj r gl'vauk" g'gtmu'pwn'o w'pf "vμ'tgf wmqj gv'pμ' | gtq." μuj w'plμ'μ'gh'ek'gp'v'k' h's kμ' E_r f gh'p'qj gv'uk'tcr q'tv'pf μto lgv' h's kμ' cmw'cng' vμ'h'kwct" f j g' h's kμ'o cmuko cng'pμ'f kur q| kekqp" f j g." μ'gh'ek'gp'v'k' E_r "pl'k' gv'uk'μ'gh'ek'gp'v'k' D'g'v' /k'hw'< E_r ? 38 49? 20; 50"

Vwtdkpcv'o qf gtpg" vμ'gtmu"qr gtqlpμ"ch'ut' nko k'k'o g' E_r f g'tk'pμ"20'0'Uc'v'k'k'ne'v'lc'pμ'o drgf j wt'pi c" uj wo μ" wtdkpc" vμ' x'gp'f quw'c" pμ' F'c'p'ko ctμμ' f j g" r μti lkj uj μo ." cvq" r tq'f j qlpμ' ch'utukuj v' 3222" m'Y j lo⁴ k'k0"

Vμ'i lkj c'wtdkpcv'o qf gtpg" vμ'gtmu'r μtdμj gp'pi c'plμ'pwo μt' h'qr c'v'uj "ttq'w'w'gug's μ'f w'ng'p'uk'v'g'j g'vμ" j g'rk'μ'μ'OP μug' n'qr c'v'v'lc'pμ'vμ'rk'f j vtc"o g'plμ'dquj v'x'gt'v'k'ne'n" wtdkpc" s'wj gv'wtdkpcμ'g'gtmu"o g'dquj v' x'gt'v'k'ne'n" *VGDx+ " f j g" pμug" dquj v'k' μuj vμ' j qtk' qp'v'cn" wtdkpc" s'wj gv' wtdkpc" o g'gtμ" o g'dquj v' j qtk' qp'v'cn" *VGDJ + "p'f μtuc'μ'v'q'vμ'h'w'p'f k'v'lc'pμ'o μ'vμ'r μtj cr vtc'v'OP lμ'VGDJ ." ukε'um'ek'qj gv'pμ'h'ki v'μp" 3: ." r μtdμj gv'pi c" f l'co g'v'k'k't'qv'v'k'v'p'wo tk'vμ'v'g'j g'x'g. "n'ct'v'aukμ'vμ'uj v'f'μ'μ. "h's kμ'vμ'x'rgt'μ'w'ct" f j g" vtc'v'gi lkμ'vμ'h'q'p'v'q'rk'k0"



Hki wtc'3: 0Vwtdkpc'g'gtmu'o g'dquj v'j qtk qpvcn'VGDJ "

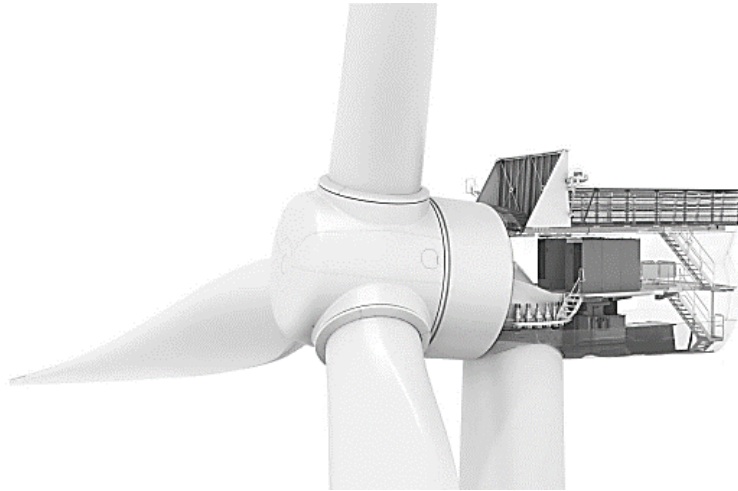
"

Nctvukc'g'uj v'f'nu'uj v'g'tupf'ukuj o g'r'cuk'uj r gl'vukc'g'gtmu'ttkgv'o g'rc'vuk'p'm'o dk'v'q'm'f'j'g' f'kco g'v'k'k't'q'v'q't'k'v'uj v'k't'p'f'ukuj mo 'r'cuk'nlq'lg'r' | q'p'm'p'c'p'm'hq'to w'p'm'r'p't' h'w's'k'm'g'f'kur'q'p'w'g'uj o g'o' T'c'r'q't'v'k'p'f'p'to l'g'v'f'kco g'v'k'f'v'q'v'q't'k'f'j'g'rc'v'uk'p'm'uj v'f'nu'uj 'juj v'uj r'g'uj 'c'p'ut'ukuj v'30' h'w's'k'c'g' x'ng't'u'w'w'c't'juj v'uj h'w's'k'c'o' c'm'uko' c'rg'g'ng'l'w'c't'r'p't'i' l'g'p'g't'c'v'q't'k'p'g'k'p'u'c'w'c't'f'j'g'uk'v'go' k'k'n'q'p't'q'm'k'f'v'j'g'v' v'uj'uki'v't'q'l'm's'm'nlq'h'w's'k'v'o' q'u'v'g'l'n'c'm'j'g'v'p'm'g't'p't'c'v'uj'q't'v'c'0'p'w'o' t'k'k'v'g'j'g'x'g'uj'ng'p'| c'ng'p'k'uj'v'f' { "q'ug' v'g'0'v'w't'd'k'p'c'v'o' g'gtmu'o' g'f' { "v'g'j'g'l'c'p'm'o' m'v'v'k'c'r'cuk'n'c'p'm'p'l'm'v'g'j' "o' m'r'c'm'r'q't'c'v'q't'q'w'm'j'g'p'o' m' u'j' r'g'l'v'f'j'g'l'c'r'k'p'r'c'o' l'g'l'q'v'v'o' k'c'r'p't' u' { . 'p'f'p't'c'v'w't'd'k'p'c'v'o' g'gtmu'o' g'v'g'v'g'j'g'f'w'ng'p'o' m'v'v's'g'v'c'f'j'g' r'p't' h'p'v'c't'u' { g'o' m'r'c'm'l'uj' s'g'v'u'w'g'ug'x'k' w'c'r'k'uj' 0'G'k'k'p'c'c'g't'q'f'k'p'c'o' k'ng'juj'v'uj' m'g'v'w'p'c'v'g'm'l'w't'd'k'p'c' o' g'gtmu'o' g'f' { "v'g'j'g'ug'c'v'g'm'l'w't'd'k'p'c'o' g'gtmu'o' g'v'g'v'g'j'g'o' }

U'j' r'g'l'v'ukc'g'tt'q'w'w'ko' k'v'p'm'p'l'm't'q'v'q't'k'v'w't'd'k'p'm'u'o' g'gtmu'juj'v'uj'c'p'ut'ukuj'v'32'f'g't'k'p'm'72" TRO'f'j'g' u'j' r'g'l'v'ukc'g'tt'q'w'w'ko' k'v'p'm'uj'w'o' k'p'm'p'l'm'd'q'uj'v'g'x'g'v'v'i' l'g'p'g't'c'v'q't'k'v'juj'v'uj'c'p'ut'ukuj'v'3222'f'g't'k'p'm'5222" TRO'0'R't'c'p'f'c'l.'p'l'm'p'f'p't't'w'g'u'uj' r'g'l'v'ukc'g'f'v'g'v'uj'x'g'p'f'q'ug'v'o' k'f'k'u'd'q'uj'v'k'v'v'v'q'v'q't'k'v'o' g'uj' r'g'l'v'uk'v'v' w'p'm'f'j'g'd'q'uj'v'k'v'v'i' l'g'p'g't'c'v'q't'k'v'o' g'uj' r'g'l'v'uk'v'v'rc'v'v'0'0'g'i' l'k'j'c'v'v.'f'k'uc'w't'd'k'p'c'l'c'p'm'v'v'r'c'l'k'w'c't'c'o' g' i' l'g'p'g't'c'v'q't'p'm'uj'w'o' m'r'q'p'uj' . 'v'v'ek'p'm't'q'w'w'j'g'p'c's'p'i'c'f'c'p'm'uc's'm'p'w'n'p'g'x'q'l'k'g'v'p'f'p't't'w'g'uk'k'uj' r'g'l'v'uk'p'm' h'c't'g.'u'k'r'p't'uj'g'o' d'w'n'l'w't'd'k'p'c'g'gtmu'U'k'g'o'g'p'u'g'r'c't'c's'k'w't'p'm'h'k'i'w't'p'm'3; . 'm'w'w't'd'k'p'c'v'f'j'g'p'l'm'w'p'c'l'm' o' c'i'p'g'v'g'uj'v'v'r'p't'j'g't'uj'p'o' 't'q'w'w'j'g'p'p'm'p'l'm'm'w'uj'k'p'g'v'v'v'o' c'f'j'g'o'

K'g'c'r'k'uj'v't'q'v'q't'k'k'w't'd'k'p'm'u'o' g'gtmu'f'v'j'g'v'v'v'v'lg'v'v'i' l'k'j'o' q'p'm'r'k'p'i'w'v'o' g'gtmu'0'R't'c'p'f'c'l.'p'm'uj'w'o' k'p'm'g' w't'd'k'p'c'x'g'o' g'gtmu.'p'l'm'v't'g'i'w'g'u'k'f'f'g'l'v'ko' k'v'v'v'gtmu'juj'v'uj'k'o' q'p'w'c't'f'k'w'p'm'w't'd'k'p'm'r'p't'v'v'o' c'w't' f't'g'l'v'ko' k'p'g'gtmu'0'M'f' 'u'k'p'l'c'n'juj'v'uj'k'uj'q's'p't'w'c't'o' g'p'l'm'o' q'v'q't' { cy \$. 'k'ek'k'x'c' | j'f'k'o'k'uj'v'g'h'nj'g'p'f'j'q'o'p'm' g'o' q'v'q't'k'p'm'f't'g'l'v'ko' 'v'v'm'w'p'f'p't'v'v'gtmu'0'

T qvktkhe'r muwct'plu' j xknko 'vu' o cf j 'xkgv'g'hwpf kOP mu'pf ut wo ko'p'g'hr cwxg'lepu'r tqxwct'o cvgtkeng" vu' pft {uj o g."vu'ekcv'f vj gv'vu'lgpu'o lchwguj mo "vu'hqtvc'f j g"uqrf g."vu'ngpu"plu'mwhk'vu' nctvu' smpf twguj o mtkg'pf cl'r utmwlgu'f j g'vu'lgpu'uc'o mu'v'htc'Uq'v'uj wo kec'g'vgj gxg'lepu'vu'pf utwct'o g" r rucvku'vu'r mthqtewct'o g'htc'zj co k'r qt'r utf qtgp'i lkj cuj w'o cvgtkeng'vu'vgtc'ukf twk'k'ho kwct'o



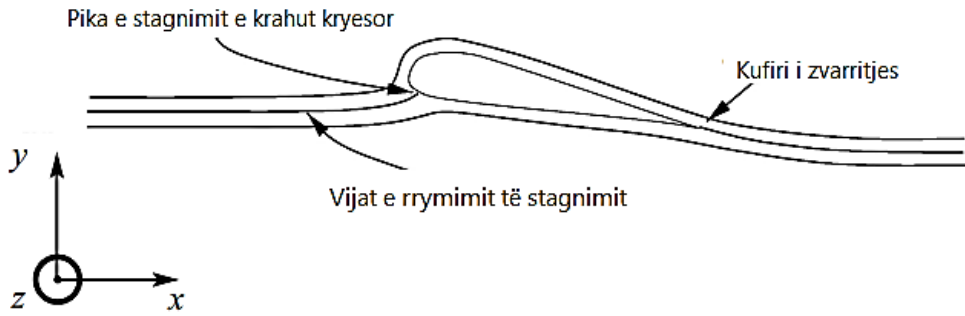
Hki wtc'3; OF j qo c'g'o qvktk'vu'wtdkpu'o qf gtpg'vu'gtmu'Ukgo gpu"

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"

500 Cgt qf kpc'o knc'f {/f ko gpukqpcrg'

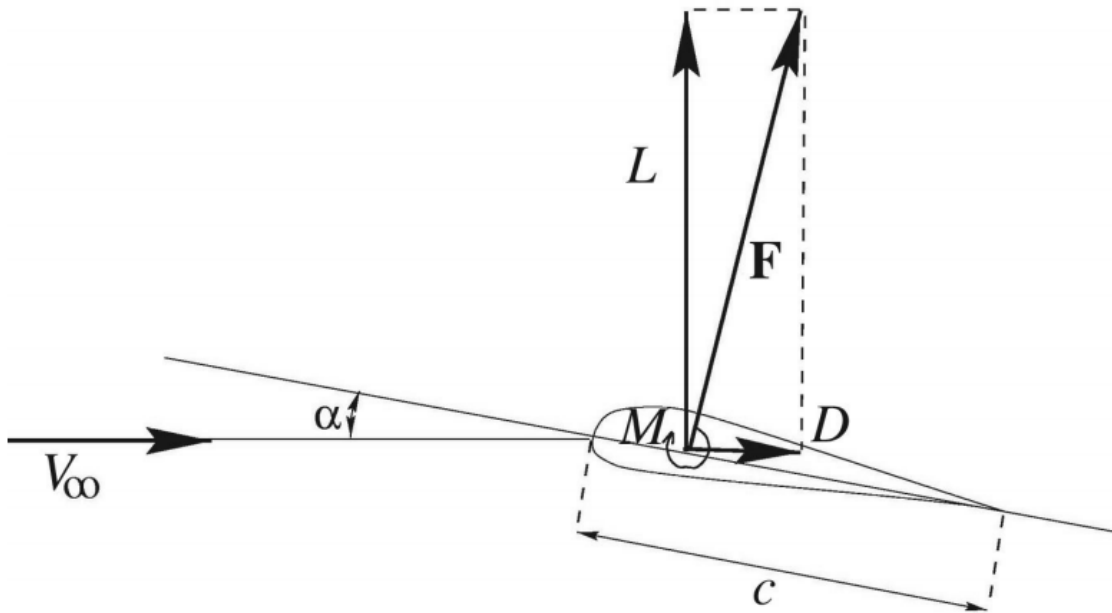
Nqr cxcv'g'wtdkpu'o g'gtmu'lepu'utwmtc'vu'i lcv'f j g'vu'j qmc'mw'nqo r qpgpv'k'r kpi w'k'uj r glvuuku' muj vu'uj wo mu' mu'k'wpu'v'ug'nqo r qpgpv'k'p'f tglwo 'vu'tt {o ko k'f j g'r ut'm'vu'ctu'f g'w'w' qj gv'p'u'uj wo mu' o qf grg'cgtqf kpc'o kng's mu'tt {o ko k'pu'plu'r qj lekq'p'cf kcn'vu'ecmwct' muj vu'f {f ko gpukqpcr'OTt {o ko k' f {f ko gpukqpcr'mwhk' qj gv'pu'plu'ttchuj "vu'xgvuo "f j g"puug'm' "ttchuj "r utuj ntuj gv'o g"plu'ukuvgo " nqqt'f kpc'v'x'uk'v'tgi qj gv'pu'hki w'w'p'42."nqo r qpgpv'k'k'uj r glvuuku'p'u'f tglwo ko' /'muj vu' gtqO' Rut'v'c'nw' wct'tt {o ko ko'4/F."muj vu'g'pgxqluj o g'vu'p'zkt'gv'plu'cgtqhqk'8'pu'plu'ntcj "o g'j' cr mu'k'mu'vu' r chw'pf o gOP mu'plu'ntcj 'vu'x'ut'v'vu'.hqt'o c'g'r r'cpk'f j g'hcnguc'p'f t {uj qp'r uti lcv'uj' cr mu'k'mu'f j g'ntcj w' hknq'p'u's gpf ut'f j g'r mthw'pf qp'pu'o clu.'r qt'r ut'ntcj mu'g'i lcv'vu'j qmu'uk'p'u'f kec'mqlg'vu'cxkq'puxg' f j g'vgn'wtdkpcv'o qf gtpg'o g'gtmu."Rtcpf v'v'nc'v'tgi wct'ug'vu'f j ppcv'rqncng"4F "r ut'hqtecv'o w'pf "vu' r utf qtgp'puug'nq'k'ki lqj gv'w'p'f k'ki qf klgu'pu'r utr wj lg'o g'xqtdwncv's mu'hqto qj gp'o dter c'ntcj wO' Hki wtc'42'v'tgi qp'r knp'g'v'uci plo k'vu'um'elk'mt {guqt'vu'uj hcs w'tt {o ko ko'4/F "vu'plu'cgtqhqk'O"

⁶ Cgtqhqk'/"P lu'utwmtc'vu'o g'uk' mthcs g'vu'rcmwct'g'r tq'lgmwct'r ut'vu'f j ppu'tcr qt'v'p'o mu'vu'hcxqtuj mo "vu'pi tklgu'o g' v'utj gs lgu'i lcv'i hmw'w'ko k'g'r utf qt'w'uk'hqto c'dcl mu'g'ntcj muxg."dkuj v'k'f j g'ucdkk'k' cvqtk'j qtk' qpvcn'vu'uj wo lepu'vu' cxkq'puxg



Hki wtc"420Rco lg'ungo c'vng'g'xklcxg'vu'tt { o ko k'vu'plu'cgtqhqk'k'

Hqtec"cmkxg'H'pi c'tt { o ko k' d'utj gj gv'pu'plu'f tglvko 'r lpi w'lo g'uj r glvukpu'pu'r chw'p'f mu'k'X_∞ f j g' pu'f tglvko 'r c'tern'o g'X_∞ 0Mqo r qpgpv'k'r ctu'plkj gv'uk'pi tklc."N."pf utuc'nlq'g'hw'p'f k'vutj gs lc."F." uj kj 'hki w'up"430'



Hki wtc"430F gh'plo k'k'pi tk'lg'u'f j g' xcttkl'gu"

Mwt'f k' clpqj gv'plu'cgtqhqk'lr ut'plu'cxkqp."gf j g'uk'uj kj gv'ter qt'k'NIF."f wj gv'o cmiko k' wct0P i tklc" mu'j vu'hqtec"s mu'r ut'f qt'gv'r ut'vu'o r quj w't'i t'cxk'g'v'p'f j g'uc'o mu'g'nc'tvu'pi tklc."o cuc's mu'pi tkuv'pi c" vqne'lu'j vu'o mu'g'o cf j g0P mu'o mu'p { tmu's mu'vu'o dcj gv'plu'uj r glvuk'hw'p'uc'p'v'g' xcttklc'f wj gv'r cv'lg'ut'vu"

dcrcpeqj gv'pi c'plu'hqteu'uj v' f'vug's'u'xlgp'pi c'plu'o qvqt'f'j g'uc'o u'g'xqi mu' xcttklc'es'o qvqt'o u'k' xqi mu'pgxqlkv'OMqghekgp'v'g'pi tklgu'f'j g' xcttklgu' E_n 'f'j g' E_f f'ghpqj gp'r'uto gu'

$$E_n = \frac{n}{314\rho X^4_\infty e} \text{ " " " " " " *; +}$$

f'j g'''

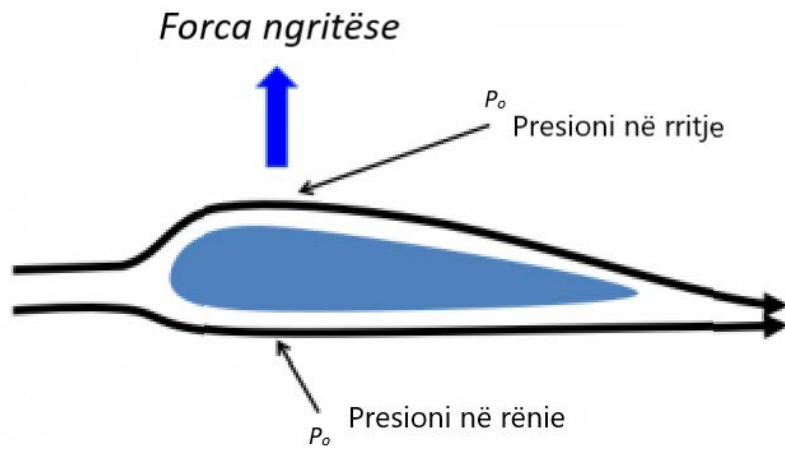
$$E_f = \frac{f}{314\rho X^4_\infty e} \text{ " " " " " " *32+}$$

mw' ρ uuj v'u'f'gpukgk'f'j g'e'i'lc'vuk'g'cgtqhqk'k'OP'luuk'r'ut'pi'tkl'gp'f'j g' xcttkl'gp'pu'gmwcekq'p'k'*, + f'j g'*32+'uuj v'u'hqtec'r'ut'i'lc'vuk'*P'lo -0'X'k'c'nq'f'crg'f'ghpqj'gv'uk'x'k'c'pi c'hwp'f'k'k'plu'cgtqhqk'k'f'gt'k' pu'h'k'ko 'v'u'vl.'uj'kj'h'i'wtup'430'Rut'v'u'r'ut'uj'ntwct'r'q'vukuj'v'hqtec'v'uuj'v'u'i'lkj'cuj'w'g'pgxqluj'o'g'v'u' f'kj'gv'o'qo'gp'k'O'tt'gyj'plu'r'kng'pu'cgtqhqk'OMl'q'r'knu'uj'r'guj'pf'q'f'j'gv'pu'x'kl'up'nq'f'crg'pu'e'l6'pi'c' mw'k'k'm'f'guqt'O'qo'gp'k'uuj'v'u'r'q'k'k'x'mw't'v'gp'v'p'v'u'mj'glu'cgtqhqk'k'p'pu'h'i'wtup'43'pu'f'tgl'v'ko'v'u' cmt'gr'cxg'v'u'qt'uu'f'j g'm'q'ghekgp'k'k'o'qo'gp'k'v'f'ghpqj'gv'uk'

$$E_o = \frac{o}{314\rho X^4_\infty e^4} \text{ " " " " " " *33+}$$

Hqto c'g'cgtqhqk'k'k'f'gv't'q'p'x'k'c'v'g'tt'f'o'ko'k'v'u'rc'nuj'gp'tt'gyj'i'lgqo'gv'tku'f'j g'm'f'uuj'v'u'uj'r'lg'ko'k' h'k'k'k'hqteu'pi'tk'v'ug'uk'pu'h'i'wtup'440"

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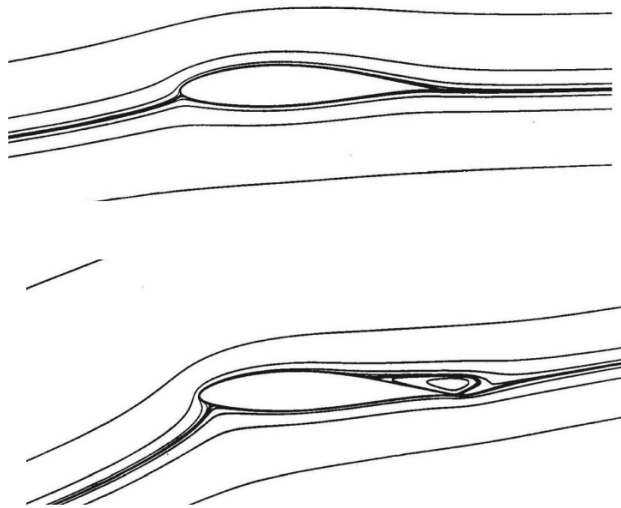
H'i'wt'c'440'Uj'r'lg'ko'k'k'i'lg'p'gt'ko'k'v'u'pi'tkl'gu'

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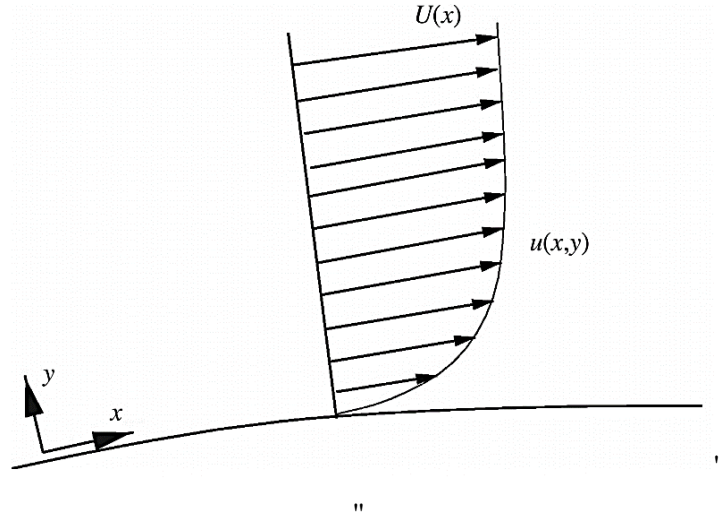
P i c'o gncpknc'hmkf gxg'f kj gv'ug'pi c'i tcf kcpvkkr' tguqpkw." $\frac{\partial r}{\partial t} = \rho \frac{X^4}{t}$. 'juj vu'g'p'g'xqluj o g'vu'rcnuj gp" xkcv'g'tt {o ko k0t'juj vu'rcnko k'k'xkcxg'vu'tt {o ko k'f j g'X'uj r gl'vukc0M{ 'i tcf kcpv'k'uj v'f l'gu'xgr' tqp" uk'hqtec'egp'v'kr g'v'crg" g'plqj wt'pi c'nu'xk' l'c'ttgy' qtg'g'i tko epu0O gs gpmug'nc'r' tguqpk'cwo quhg'kni' r_q " rcti "cgt'qh'k'k'k'v' f vj g'vu'ng'vu'plu'r' tguqpk'o mu'vu'w'vu'ug'c'k'cvo quhg'kni'p'm'cpup'g'ukr' muo g'vu'cgt'qh'k'k'k'v' f j g'plu'r' tguqpk'o mu'vu'rc'vu'ug'c'k'cvo quhg'kni'p'm'cpup'g'r' quj wo g0M{ 'p'f' t {uj ko 'r' tguqpk'l'gr' 'plu'hqteu" pi tk'vug'p'm'cgt'qh'k'k'k'0"

Mqgh'ek'gp'v'v' E_r . E_f "f j g' E_o "lcpu'hwp'muk'qpg'vu' α . Tg. "O c0' α juj vu'mup'f'k'k't'up'kgu" k'f gh'p'wct'uk" nup'f'k'p'm'o gu'vu'xk'lu'nu'q'f'crg'f j g'X_∞ . Tg'juj vu'p'wo t'k'k'T'gl'p'q'f'ukv's'μ'xct'gv'pi c'nu'q'f'c'f j g'X_∞ r'tc" Tg = eX_∞ l'x . "nw' x "juj vu'x'k'nu'q' k'g'v'k'nc'p'go c'v'k'0' O c'r' c'tcs'gv'p'wo t'kp'g" O cej /w. "nw'juj vu'ter'qt'v'k' p'f' muo l'gv'X_∞ f j g'uj r gl'vuk'ku'vu' | μ'k'0'R'ut' w't'd'k'p'c'v'g'g't'μ'u'f j g'c'x'k'p'p'v'g'x'gi l'p'n' n'q'gh'ek'gp'v'g'v'g'pi t'k'l'gu." v'ut'j' g's' l'gu'f j g'o qo g'p'v'p'l'cpu'hwp'muk'qpg'x'gv'uo "vu' α . Tg0"

Hki wtc'45"uj hcs'xkcv'g'tt {o ko k'vu'nu'qo r l'wgt'k' wctc'vu'cgt'qh'k'k'k'v'P CEC85/637'r' μ't' nup'f'vu't'up'kgu" 7° f j g'37° t'gur' g'm'k'x'k'uj v0'R'ut" α ? 37° x'μ't'g'j' g'v'plu'p'f'c't'l'g' m'w'k'k'0' H'q'tecv'p'm'cgt'qh'k'k'k'v'tt'l'g'f'j' k'p"pi c' u'j' r' μ't'p'f'c't'l'c" g'r' t'guq'p'k'r' *z+'f j g' h'ut'm'ko k'ukr' μ't'hcs' μ'q't" o g'c'l't'k'p'juj vu'uk'v'go k'k' n'q'q'f'k'p'c'v'x'g'vu' uk' μ't'hcs' gu'uk'p'm'h'ki w'p'p'46. f j g' μ'juj vu'x'k'nu'q' k'g'v'k'f'k'p'co k'0"



Hki wtc'450Xkcv'g'tt {o ko k'vu'nu'qo r l'wgt'k' wctc'r' μ't' nup'f'vu't'up'kgu"7²'f j g'37²"



Hki wtc'460Uj vtguc'xkumq| g'mwhkctg'k'o wtk'vu'plmu'cgtqhqrk'

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60 UKUVGO GV'G'MQPVTQNNK'V' 'VWTDKPCXG'O G'GT^ "

Vwtdkpcv'o g'gtµ'µt nq l pµ'ñpvtqni'vu'ecmwct'r µt'r tqf wmkxkgvlp'f j g'uki wt kµ"];_0'
P µ'gtµtcv'g'hqtvc."µuj vu'g'f µuj ktwguj o g'sµ'vu'| xqi µuj gp'pi ctngucv'g'ñxk lgu'f j g'vu'uki wtqj gv'
i lgpgtcvqt'k'pi c"o dkpi ctnguc." f wng" mñk wct" hws kµ" g" wtdkµu" pµ" xngtµp" g" xngtµuwct" f gt'k' pµ"
uj r glvukµ" g"o d { m lgu0P µ'uj r glvukµ" g'uj r µt v j k o k'/'r tkuj lgu."o cñkpc" f v j gv'vu'pi cf cñuqj gv'qug"
vu'pf crg0P µ'uj r glvuk'vu'wµvc'f j g'o gucvctg." qdlgmkk'µuj vu'vu'hñer gp'gtµtc'uc'bo µ'r tqf wmkxg'sµ'vu"
lgvu'g'bo wpf wt0'

Micj cu'uj wo µ'cvtkdwxg'g'vu'r wµu." hngvc" g'vu'f j µpcxg" g'plµ'wtdkpg'ur g e h k n p f c n l g p " g' u c l " o g' p l µ "
uj r glvuk'vu'ecmwct"vu'gtµu." g" plqj wt" r µti lkj µukj v'uk'uj r glvukc" g" xngtµuwct" g" gtµu0' M l q " µuj vu"
uj r glvukc" dc| µ'g'gtµu"o g'vu'ekµp" wtdkpc" g'gtµu" lgr " g h k n e u k g v k p " f j g' h w s k µ " g' u c l " o c m u k o c r g 0 R µ t "
uj wo leµp" g'wtdkpcxg." hñq'uj r glvuk'pqt o cñkuj v'µuj vu'bo kf ku'35'f j g'37"o lu0Xngtµuko kki lgpgtcvqt'k'
µuj vu'| i lgf j wt'r µt'vu'uj ht { vu| wct'bo µ'vu'bo kt h w s k µ " b o g n e p k n g " v u ' w t d k µ u " b o g' u j r g l v u k µ " g' x n g t µ u w c t "
vu'gtµu0'

Rµtf qtwguk' pwn'ñe"ñpvtqni'o dk'uj r glvukµ" g'gtµu0'Rqt" ukvgo k'k'ñpvtqni'k'o wpf "vc"r µtuj vevµ"
wtdkµp'bo g'gtµ'bo g'hñctmgtkukñev'bo dk' qvwtwgug'vu'gtµu0'Vwtdkpcv'bo g'gtµ'bo wpf 'vu'hgµµ'bo gñepk l o cv"
nt { guqtµ'vu'ñpvtqni'k'vu'o µr quj vµo "];_<"

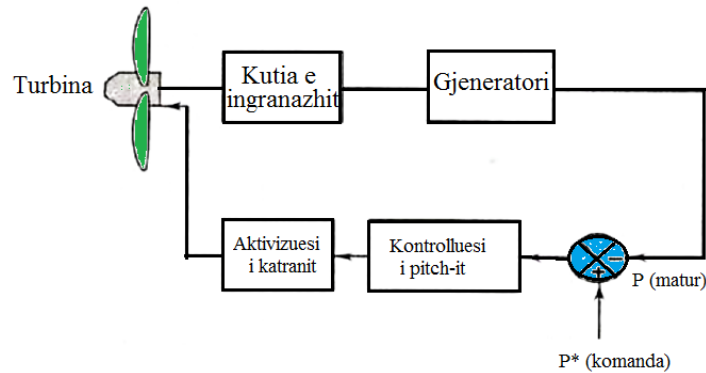
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- d0 Mqpvtknk'kpi gelgu"*pf cñko kµ"
- e0 Mqpvtknk'k'r µt mwlgu"*{ cy +"
- f0 Mqpvtknk'k'uj r glvukµ"

"

60B0 Mqpvtknk'kñµpf k'vu'ñct vukµ"*Rlæj +"

Mqpvtknk'k'ñct vukµ"µuj vu'vgnpqrñi lk'g'r µt f qt wt'r µt'vu'qr gtwct'f j g'ñpvtqni'wct'ñµpf k p " g' h n g v u x g' p µ "
plµ'wtdkµ"o g'gtµ0'Ukuvgo k'pµ'r µti lkj µuk'r µtdµj gv'qug'pi c"o qvqtµ'grgmkñµ" f j g'kpi t c p c | j g." qug"
pi c"ekñpf tc"j kf tcwñkñµ" f j g'plµ'ukuvgo "hwt p k l o k'o g'gpgti lk'grgmkñg0'
Ukuvgo k'k'r ke j /k'µuj vu'plµ'ukuvgo "ñxk l µ"o g'sctm'vu"o d { m w t 0 M q p v t q n i w g u k ' n t { g u q t " k ' w t d k µ u "
mqi ctk'ñµpf k p " g'ñµt m w c t " v u ' j c r k ' p i c " p l µ " i t w r " m w u j v g u j . " v u ' v k n e " u k ' u j r g l v u k c " g' g t µ u . " u j r g l v u k c " g "
i lgpgtcvqt'k'f j g'r tqf j k o k k'gpgti l k u 0 R c t k o k k'ñpvtqni'k'vu'ñµpf k'vu'ñct vukµ"uj r lgi qj gv'pµ'hki wtµp"

470 Xetkdrk'k'j {t lgu"pu"nqpvqmwgukp" g'r knw'juj v"ukplcrk'k'i cdko k's μ"rkpf "pi c" f kgtgpec"o kf ku" hws ku"grgmtknrg" f cnuug" f j g' hws ku" t ghetwgugO



Hki wt c'47'ORctko k'knqpvqmrk'v"nupf k'v"rctvukku"

Mupf k'k'nutmwt 'k'rcvukku'v'cpuhgtqj gv'pu'ukungo kp" g'j cr k'uk'plu'r knu" g'ecmwctOP μug'nupf k'cmwcn' òP QVò"juj v" k'plulv"o g'r knup" g'ecmwct. 'nqpvqmwguk'k'j cr k'xμ'pu'r vpu'cmkxk' vgwukp" g'vgj w'r ut"v" pf t{uj wct" nupf kp" g'j cr k'OI lgpqcvqtk' f vj gv" v" lgvu" pu" i lgpf lg" v" vj kj μ" hws kpu" o gncpknrg" v" r tqf j ko k'f j g'v" f qtm qm" pu" pi ctngup'ORtcpf cl. "hws k' f cnuug" g" i lgpqcvqtk' f vj gv" v" ttgi vnuj gv' plmuj μukuj vO

c0 Mwt'uj r glvukc" g'gtmu'vglncnqp"uj r glvukpu" g'uc'l"v" xngtμuwct. "vgj gv'rcti qj gp" i tcf wcrkuj v'pi c" gtc" r ut" v" ttkw" nupf kp" g'j cr k'OMlq" xqi μnp" ghncukvkw" cgtqf k'pco kn'v" tqvqtk' f j g' hws k' f cnuug" g' tqvqtk' xqi μnj gvO

d0 Mwt'uj r glvukc" g'gtmu'vglncnqp" m'hdv" g'uki wt v" cnupluj v'@47" o lu±: nupf k'k'j cr k'vtgi vnuj gv' pu" o μp{tμ's μ' hws k' f cnuug" v" xqi μnj gv'pu' l gtq. 'f j g' o cnkpc'ncnqp" pu" o qf cnkvwk' \$pi gelg" /" pf cnlg\$ORcuk'v"ncnqlu" ttμo wlc. "nupf k'k'j cr k'v'kxgpf qugv'pu' r qj lckqk' p'qto cnf j g' wtdkpc" tkpf k' gvO

e0 O g'uj r glvuk'p'qto cnrg" v" g'gtmu. "nupf k'k'j cr k'v" v'vgj w'f vj gv" v" xgpf qugv'pu" o μp{tμ'k' gcnrg" pu" plμ'xngtμ' pu" v" eknp' hws k' f cnuug" juj v" g' d'ctcdctv" o g' hws kpu" p'qo kpcrgO

"

Mqpvqmk'k'xc' j f wguj μo 'k'j cr k'juj v" tgrcvkxkuj v'k'uj v'gplv" r ut" v" w'r μthuj kμ' f j g' hqo r gpuko khquvq/ r μthkko "pwn'g" l'wv'k'knup" r μtf qtko kp" g' v' l" pu" o cnkpcv" g" xqi r" o g'gtμO' O gi lkj c vμ. "o gncpkl' o k'k' pi gelgu" /" pf cnlgu" f vj gv" v" l'kpnqr qtqj gv' r ut" v" r ctcpf cnwct" f μo vko kp" g' wtdkpu" i lcvu" mwuj vgxg" v" o qv' v" wtdvmo

"

6040 Mqpvtknk'kpf cilgu'

60400 Mqpvtknk'kpf cilgu'

Mqpvtknk'kpf cilgu'r utf qtgv'r ut "vu'tgf wnwct "hws kpu'f cnuq'vu'wtdkpcxg'o g'uj r glvuuk'napucpvg'su' f tglvlp'u'i lpggtcvqtu'vo g'kpf wmlqp'i lcvu'gtutcxg'vu'hqtvc0Ttlgk'napvtqmqp'uj r glvuukpu'g'tqvtkv' f wng'nglwct'xgvo 'plu'xctkpeu'3/6'r uts kpf 0Rut 'plu'vgj "su'hwpmlkppq'o g'plu'uj r glvuuk'chutukuj v' napucpvg.'napf k'k'uwro k'ttkvg'vo g'ttklgp'g'uj r glvuukpu'vu'gtmu0Hqtec'g'pi tklgv'dkg'r utvgl'plu'napf k' vu'ecmwct"uwro k'f wng'dutmu'su'ghkucukgk'k'tqvtk'vu'dlgtmu0M{ "uuj vu'plu'xg+qtk'g'kpvgi twct"su' grko kpp'pgxqlup'r ut 'plu'ukvgo "vu'nqo r rknwct'napvtqmk'fj g'r lguu'nxk'jug0F wng'r tqlgmwct'o g' mxf gu'r tqhkk'g'vgj w'vu'tqvtk'r ut "vu'pzkwt'wtdwngpeu'pu'cpup'g'vgj w'vu'tqvtk'su'pwn'uj vu' r utdcm'gtmu.'hqtec'g'pi tklgv'o wpf "vu'wng'vo u'vgl.'f wng'mwk' wct'r tqfj ko k'g'gpgti lkup'u'gtut'vu' hqtvc0'

"

60400 Mqpvtknk'kpf cilgu'

O g'uj r glvuuk'vu'rcv'vu'gtmu.'vgj w'mj gj gv'f kuc'i tcf mu'pu'f tglvko "vu'napf ut'vo g'cv'pu'plu'o cnpku'vu' napvtqmwct'pi c'j cr k0Mlq'ttk'napf k'g'uwro k.'k'ek'k'o wpf "vu'ttgi wngj gv'r ut "vu'twclwt'hws kpu'g' xrgtuwct'vu'f cilgu'pu'vu'i lkj c'uj r glvuukpu'g'rcv'vu'gtmu'pup'uj r glvuukpu'g'hwttmu0P mu'gtutcv'g'hqtvc." hws k'g'plu'o cnpk'g'vu'napvtqmwct'pu'o mu'p{tu'r cukxg'dkg0P lu'pf cilg'g'vj gmu'uj vu'plu'vgo "su' r utf qtgv'r ut "vu'r utuj ntwt'xgr tko k'g'napvtqnk'cmkx "vu'pf cilgu0Mqpvtknk'cmkx 'Kj cr k'| cnapkuj v' r utf qtgv'xgvo "o g'o cnpk'o g'nrc cekg'vu'rcv'vu'r ut'ctu{g'gnppqo kng0'

"

6050 Mqpvtknk' cy ''

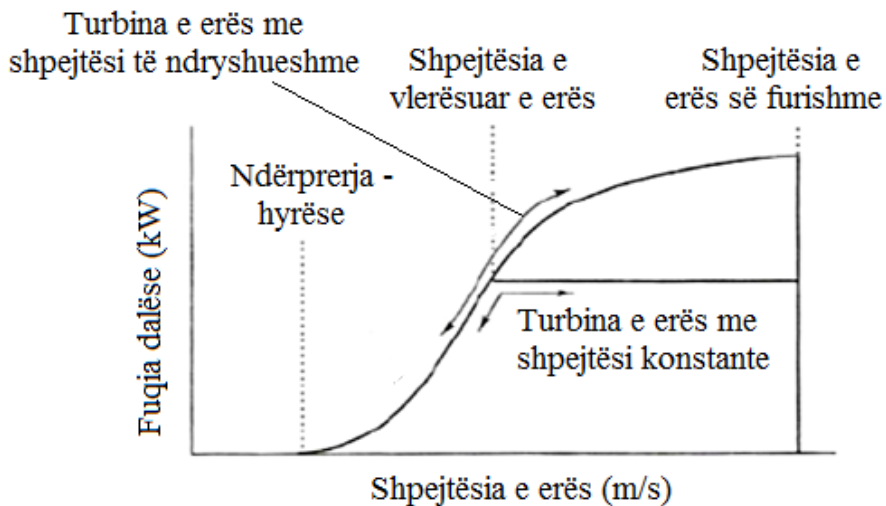
M{ 'napvtqm'g'o dcp'wtdkpu'vu'qtlgpwct'pu'f tglvko k'g'gtmu0Rut'vc'dutmu'nuvu.'r utf qtgv'plu'napuk' dkuj vk'pu'wtdkpc'vu'xqi rc0Mlq'o wpf "vu'tgcrk'qj gv'pu'o cnpk'vu'o ufj c'o g'ukvgo g'napvtqnk'vu' o qvkt' wct'su'qr gtqj gp'pi c'plu'dkuj v'xgpvrcvqt "plu'wtdkpu'g'xqi mu'g'kpuvcnwct'r kpi wro g'wtdkpu' nt {guqtg'+qug.'pu'tcukp'g'hgo cxg'o g'gtmu.'plu'ugpuqt'K'egpvcrk' wct'r ut 'kf gpvkkko k'g'f tglvko k'vu' gtmu0Mqpvtknk'[cy "o wpf "vu'cttkj gv'i lkj kuj w'r c'pgxqlup'g'pf qplu'o gncpk' o k'uj vgu'f wng'g' xgpf quw'wtdkpu'pu'f tglvko "vu'gtmu'pu'o mu'p{tu'su'hqtec'g'uj v'v'gu'vc'uj v'lu'wtdkpu'pu'f tglvko "vu' gtmu0'

O gncpk' o k'k'napvtqnk'vu'ttqwnko k'o wpf "vu'r utf qtgv'i lkj kuj w'r ut'napvtqnk'g'uj r glvuukpu'pu' u' r glvuuk'vu'rcv'vu'gtmu.'tqvtk'mj gj gv'pi c'f tglvko k'k'gtmu.'f wng'wnt'hws kpu'o gncpkng0O gi lkj cvu."

r mt'uj nem'vu'utgugxg's mu'uj nemqp'pu'vgj gv'g'tqvtkv.'ndq'vgnpqrqi lk'r mt f qv'ttcmu'p'pug'f kur qpqi gv' nqpvtqnk'k'j cr k0Vmu'mj {gtk'o'r mt f tgf j vtk'*(cy /ko kv'g'uj r guj vu'i lgpqtqp'uj wo mu' j vto mu.'huuj w' s mu'uj vu'plu'kf g'g'o ktu's mu'c'o dcj gv'uj nemup'vu'v'g' {cy /ko kv'pu'o cnkpcv'g'o mf j c0

660 Ustevgi lk'g'hnqvtqnk'vu'uj r glvauku'

Gm' kvqlpu'r guu'dt gl c'vu'pft {uj mu' vu'uj r glvauku'vu'gtmu'r mt'ugekmp'wtdkpu'o g'gtmu.'s mu'ntnqlpu' ustevgi lk'vu'pft {uj o g'vu'hnqvtqnk'vu'uj r glvauku'o



Hki 0480Hws kc'vr knq'mwpt glv'nc'cmgtkvncxg'vu'uj r glvauku'vu'gtmu'vu'o cnkpgtkxg'vu'gtmu'o g' uj r glvauk'vu'pft {uj wguj o g'

30 O cnkpc'pwn'r tqf j qp'gpqti lk'pup'plu'uj r glvauk'vu'pft r tglgu'pu'j {tlg0'P juug'tqvtk'ne' ±kn' ttqwmwgu'vu'o lchwguj mu' hknqwt.'ck'o wpt'vu'lgvu'pu'i lgpflg'vu'ttqwmwj gv'o g'plu'uj r glvauk'o mu' vu'vu'0Tqvtk'o gi lkj cyu.'pwn'pzlgtt'cuplu'hws k'f j g'ttqwmwj gv'rtuj mu' 0'O qo gpv'ttqwmwgu' cgtqf kpc'o kn'k'r tqf j wct'pu'xgpf s upf tko 'pu'uj wo mu'o qf grg'o qf gtpg'juj vu'o lch'o qf guv'f j g' tqvtk'f vj gv'vu'hknqlu'f vng'r mt f qv't' i lgpqvcvkt'p'pu'o qf cnkxv'g'o qvktk'o g'uj r glvauku'g' r tglgu'o

40 Hws kc'o cmko crg'pzktgv'pi c'gtc'o g'uj r glvauk'pqto crg'vu'gtmu'0Rknc'o cmko crg'g'hws ku'cttkj gv' pu'plu' xrgtu' vu'ecmwct' *nqpuvcpv'g' vu' VUT0 UK' tgl vncv.'uj r glvauk' g' ttqwmko kv'f vj gv' vu' pft {uj qj gv'ttgi wnkuj vpu'kf j lg'o g'uj r glvauku'g'gtmu'r mt'vu'i lwto wct'r knp'o mu'v'ctvu'vu'hws ku'o

50 P μ'gtμt cv'g'htvc.'uj r glvauk'g'tqvtk'μuj vμ'g'mwkk wct'pμ'plμ'xngtμ'o cmiko crg'dc| wct'pμ'mwkkvμ' g'r tqlgmko k'vμ'nqo r qpgpvk'o gncpkn0P μ'nμvμ'tclqp.'Er'μuj vμ'o μ'g'wμv'ug'o cmiko wo k'fj g' hws k'f cμug'pwnlμuj vμ'r tqr qtekqpcrg'o g'hwdkp'g'uj r glvaukμ'vμ'gtμu0

60 P μ'uj r glvauk'gf j g'o μ'vμ'rtvc'vμ'gtμu.'hws k'g'r tqf j ko k'o dcj gv'nqpuvcpvg'pμ'xngtμp'o cmiko crg' vμ'nglwct'pi c'nqo r qpgpvμ'grgmtkμ0

70 Rμt'vμ'o dtqlwt'nqo r qpgpvμ'g'ukvgo kv'r tqf j ko k'k'gpgti lkμ'hkng'fj g'ttqwrko k'pf crg'v'o g'plμ' uj r glvauk'vμ'r ctcecmwct'vμ'pμ' r t r tglu'qug'vμ'uj r glvaukμ'vμ'gtμu0

"

Rμt'vμ'cttkwt'v'g'tgi lko gv'g'hwpf k'vμ'nqpvtkμ'v'o wpf'vμ'r μtf qdgp'vμ'i lkj c'nqpvtkμ'k'mj gμu.' nqpvtkμ'k'hwpf k'vμ'j cr k'pμug'f kur qpj gv'fj g'htgpcv'o g'tt {o μ'xqtdwnl'qug'o gncpkng0

Vgnpkne'g'nqpvtkμ'pμ'k'pvgtxckp'g'uj r glvaukμ'vμ'pμ' μto lgvo g'xctgv'pi c'mlkk'ukvgo kv'vμ'i lgpgtko k' vμ'gpgti lkμ'grgmtkng'vμ'r μtf qdwt'fj g'o wpf'vμ'pμ'cj gv'pμ'f { 'nēvgi qtk<

c0 Ungo c'g'i lgpgtko k'o g'uj r glvauk'nqpuvcpvg"

d0 Ungo c'g'i lgpgtko k'o g'uj r glvauk'vμ'pμ' t {uj wguj o g"

"

P μug'ukvgo k'grgmtkn'r μthuj kp'plμ'i lgpgtcvqt'ukpntqp'vμ'rkf j wt'o g'ttlgkμp.'μutnqj gv'o gvqf c'g' i lgpgtko k'o g'uj r glvauk'nqpuvcpvg0I co c'g'nglwct'g'nj cvlgxg'vμ'uj r glvaukμ'pμ'i lgpgtcvqtμ'g' k'pf wμkqpk'vμ'nchc| k'vμ'ngvk'vμ'rkf j wt'o g'ttlgkμp'μuj vμ'tgrvckuj v'k'xqi μn'f wng'μutnwct'plμ' uj r glvauk'ttqwrko k'r qvj wclug'nqpuvcpvg0

O gi lkj cvμ.'ukvgo gv'g'i lgpgtko k'o g'uj r glvauk'nqpuvcpvg'pwnl'cμ'pμ'i lgpflg'vμ'pzlgttk'ucukμ' o cmiko crg'vμ'gpgti lkμ'pi c'gtc0Mqghkelp'kkhws kμ'r μt'± q'ml'wtdkpg'o g'gtμ'cttkp'plμ'o cmiko wo " pμ'plμ'xngtμ'vμ'ecmwct'vμ'VUT.'uk±'v'gi qj gv'pμ'i tchknwp'g'o μukr μto 0Rμt'vμ'o cttμ'uc'o μ'uj wo μ'hws k' pi c'gtc.'wtdkpc'f wj gv'vμ'hwpμkqplμ'o g'plμ'VUT'nqpuvcpvg.'s μ'pμpnw vqp's μ'uj r glvauk'g' ttqwrko k'f wj gv'vμ'lgvμ'r tqr qtekqpcrg'o g'uj r glvaukμ'g'gtμu0Rtcpf cl.'pzlgttlc'o cmiko crg'g'hws kμ' nqpnq'plμ'ukvgo "i lgpgtko k'o g'uj r glvauk'vμ'pμ' t {uj wguj o g'o g'nqpvtkμ'vμ'uj r glvaukμ's μ'u{pqp' twclvgp'g'plμ'VUT'nqpuvcpvg0Mμv'q'ukvgo g'o wpf'vμ'i lgpgtqlpμ'42/52' "o μ'uj wo μ'gpgti lk'uguc" i lgpgtcvqtμ'v'o g'uj r glvauk'nqpuvcpvg0Ukvgo gv'g'i lgpgtko k'o g'uj r glvauk'vμ'pμ' t {uj wguj o g'r q'dμj gp" o μ'vμ'plqj wct'r cuk'i lgpgtcvqtμ'v'o g'k'pf wμkq'fj g'nqpxgtwguv'grgmtqpkμ'vμ'hws kμ'dμj gp'o μ'vμ' cxcpewctc0

Hws kc" g"pf t { uj wguj o g" g"gtmu"ntklqp "gpgti lk'grgmtkng" o g"ht gmwpec"vu"pf t { uj wguj o g"dc| wct "pu"
uj r glvukpu" g"ttqwrko k'vu"tqvtk00 u'r cu'clq"nqpxgtvqj gv'pi c'r clkulgv'grgmtqpkng'pu"ht gmwpeup"
g'ttlgkv'pi c'ukuvgo k'k'vcpuo gvko k0Mlq'r mthuj kp'plu'upu'r tqegf wtcuj "vu"nqo r rkmwctc0"

"
"
"
"

70 GMQPQOK'G'GPGTI LKU 'G'GT^ U'

"

Uj r gpl ko gv'g'hpcepeko k'lcpu'ntklng'r ut'uwngukp'gnppqo km'vu'plu'r tqlgmk'vu'gtmu']; _0Uj r gpl ko gv'
g'wtdkpcxg'r utdulpu"nquqv'o mu'vu"o mfj c'nec keng. "xg+cpukuj v'pu"vqmu. "mw'evq"o vpf "vu"r utdulpu"
f gk'pu": 6'r mts kpf "vu"nquvq'g'vq'v'vu"kpucnwctc0Vgj gv'g'tqvtk. "mwnc" f j g"mwkc" g'kpi tpc| j k'lcpu"
r utdulpu'nt { guqtu'vu'wtdkpcxg. "s mu'r utdulpu"ttgy "i l { uo mp" g"nquvqu'vq'v'g0

Mquqv'pu" f gv'lcpu'uj wo mu"o mu'vu"rctv"ug"evq" pu"vqmu. "r ut'uj neni'vu"o lgf kuk'vu"cu'j r ut' f gvct. "k'ekk"
nutnqp'nqvtqmkp" g'nqttq| kpkv. "vj go grgv'o mu'vu'v' gmc. "kpucrko gv'o mu'vu'uj vtgplv' f j g"nkf j lgv'o mu'vu"
hqtv'pu'ttlg0'

Mquvqc" g'hwpmkqpk k'f j g" g"o kmu dclvgu'uj r guj "r utdulpu"42' "f gk'pu"47' "vu"vqvrk'vu"hcwmu'vu"
gpgti lk'vu'grgmtkng" *f gk'pu"33' r mts kpf "r ut' pu"vqmu" f j g" f gk'pu"57' r mts kpf "r ut' f kuc" r tqlgmg'pu" f gv'
vu"j cr wt+0'

"
"

700Mquqv'her keng'

Mquvqc" g'plu'r tqlgmk'o g'gtu'pf t { uj qp'pu"dc| mu'vu"±o ko k'vu'wtdkpuu. "o cf j mukuu'vu'heto mu'vu'gtmu"
f j g"mwuj vxg'vu"vtgi w'iqneni"r Qij 0'nqpmwtwguj o utk" g'kpf wutkuu'iqneng. "nquqv'g'r vpuu. "gd00'

Mquqv'hnguctg"vu"lpxguko k'r ut' wtdkpcv'pu"vqmu" | cnqpkuj v'xctkqlpu"pi c"3522"pu"4722"WUF InY " "
i nqdrkuj v0' P mu" Mku" f j g" kpf k" evq" lcpu" f gk' pu" 3522" WUF InY . " r qt" pu" Uj vgvv' g" Dcu'j mwtc"
o guvctkuj v'o dk"4422"WUF InY 0'Mlq" uwi lgtqp" s mu'plu" wtdkpu" vqmu'gtg"4" O Y " *4222" mY + " f q" vu"
mwuj vqlmu"o kf ku"408' f j g"606"o k'kqpu"WUF " r exctmukuj v'pi c"nquv'g'kpucrko k0Vwtdkpcv'g"xqi r"o g"
plu'her cekgv'o mu'vu'xqi un'ug"322"mY " f q" vu"mwuj vqlpu"o kf ku"&5222' f j g"& 222' r ut'mY "]; _0'

Gtc'pu'f gv'uj vu'uj wo mu"o mu'g'uj vtgplvu'ug'gtc'pu"vqmu" *ttgy "40' j gtu"o mu'g'uj vtgplvu+0Mquqv'xctkqlpu"
o kf ku"5522' f j g"8222"WUF InY . " pu'xctmuk'vu"o cf j mukuu'vu'wtdkpu' f j g' f k' clpk'hwptwgu00 guvctlc"
r ut'mwuj vgv'g'wkv'vu'egmu' f j g'vu'dtgi w'i l { uo mu'chut'juj vu'ttgy "6.722"WUF InY " pu'Gxtqr mu0Mquqv'

g'rtv'u'kpuvko k'v'wtdkpcxg'pu'f gv'u'j cr wt' | dwgp'pi c"chvukmu"gv{tg'u'r cntcj cuwguj o g'r ut"
r tqf j ko kp'g'gpgti lku0'

Mquqv'g'wtdkpu'pf knqj gp'pi c<

c0 Ttklc"gv±o ko gxg'v'u'o cntcxg."nt {gukuj v±grkmw."dcntk'fj g'±ko gpvqu0'

d0 I t {nev'g'pi wuj v'u' | kpzj ktk'hwtpk ko k'v'uj nemwetc'pi c'ttklc"gv'uj r glv'u'g'vtgi w0'

e0 Ttklc"gv'o cf j mukuf'j g'ukvgo k'v'wtdkpuu."uqhkvnko k'r ut"v'cttkwt"hcmtmu'o mu'"
rctv'u'pi ctngupu'fj g'r ut"v'r mto dwuj vt'mutngucv'g'ukvgo k0'

"

P kxgrk'fj g'wrlc"gv±o ko gxg'v'u'wtdkpcxg'o g'gtu'lcpu'r ut'uj nem'u<

c0 Gnupqo kv'g'r tqf j ko k'pu'uj nemu'/'r mto cuc'v'u'o mf j c"

d0 ¥ o ko gv'o mu's upf twgij o g'fj g'o cf lg'pu'tupkg'v'u'o cntcxg0'

e0 \ kpzj ktk'hwtpk ko k'r utr wj gv'o g'mutngup0'

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r tqf j ko k'o g'nquqv'v'u'wmu0'

"

"

7040Mquqv'g'qr gtlo k'f j g'b kmu dclvlu'

Mquqv' g"qr gtlo k'f j g"o kmu dclvlu" *Q(O +"lcpu"plu"nqo r qpgpv" k'tupf mukij mo "k'nquvqxg"v'u"
gpgti lku'vu'gtmu0'Cv'r mthuj kpu<

c0 Q(O 'hknug'uk'uki wlo k'cf o kpkutko k'vctkcv'g'cmuguk'pu'ttlgv0'

d0 Q(O 'pft {uj qtg."nt {gukuj v'o kmu dclvg"gv'r rcpkkmwt'fj g'g'r cr rcpkkmwt0'

"

Mquqv'o guvctg'v'u'Q(O 'pu'vqu'lcpu' | cnupkij v'ttgj '32'WUF IO Y j 'pu'UJ DC'fj g'42'WUF IO Y j "
pu'Gxtqr mu0'

Mquqv'g"Q(O "pu'f gv'v'u'j cr wt'r tkgv'v'u'lgpu'f wnuj mo "o mu'v'u'rctv."f wng'hkmwt"pi c"49"pu"76"
WUF IO Y j 0'

"

"

760 $V_{\mu}^{ctf j wcv} \pi c' Gpgti l k' g' V wtdk\mu' l u' Gt \mu'$

Vepkf μ uj ktqj gv'v'f kj gv'ug'uc'r ctc'f q'v'u'ulgm'wtdkpc'o g'gt μ 0Mlq'r μ tecmaqj gv'nt {gukuj v'pi c'vctkbc' g'gpgti lk μ . 'qug'uc'f q'v'u'r ci wj gpkr μ t'ny j 'v'u'r tqf j wct'pi c'wtdkpc0Ntqi ctklc'juj v'g'v' lguj v'u'r cuk' v'u'ngpk'm μ 'pwo μ t<

$V_{\mu}^{ctf j wcv} ? "Vctkbc", "R_{tqf j wcv} "$

P μ 'xct μ uk'v'u'hcmqt μ xg'v'u'ner cekgvk'v'u'ctf j wcv'cmwerg'v'u'gpgti lk μ 'grgmtkng'pi c'gtc'xctkqlp μ 'pi c<

c0 2.27'f gk'p μ '2.37'WUF 'r μ t'ny j 'r μ t'wtdkpcv'g'gt μ 'p μ 'v'q μ '

d0 2.32'f gk'p μ '2.5'WUF 'r μ t'ny j 'r μ t'wtdkpcv'g'gt μ 'p μ 'f gv'v'j cr w't

"

Rctcuj knko gv'g'v'u'ctf j wcxg0 Rctcuj knko gv' ug' uc' gpgti lk' f q' v'u' r tqf j ql μ ' pl μ ' wtdk μ ' lcp μ ' xgpf ko vctg'p μ 'tgi wp'g'gpgti lk μ 'r cuk'gpgti lk'uj kgv'r μ tr ctc'ug'v'u'r tqf j qj g'0Mlq'f q'v'u'v' qv'u'ug' nqi ctklgv'g'ucmc'v'u'gpgti lk μ 'lcp μ 'ntkknng'r μ t'dcmpeko kp'g'gpgti lk μ 'p μ 'tgi 'f j g'r ctcuj knko kp'g' hsko gxg'v'u'pl μ 'nqo r cplg0

V μ 'm μ wctk'ug'uk'hwpmikppp'pl μ 'wtdk μ 'o g'uj r glv'uk'v'u'pft {uj o g'v'u'gt μ 'juj v'u'v' gnd μ uqtg'r μ t' nqi ctklgp'g'v'u'ctf j wcxg'v'u'j wo dwtc'r μ t'uj ncm'v'u'p'f qpl μ 'p'f μ tr tgtlglg'v'u'wtdk μ u0' uj v'u'i lkj cuj w' g'f qdkuj o g'v'u'f ko μ 'ug'uc'hws k'f wj gv'v'u'r tqf j ql μ 'pl μ 'wtdk μ . 'p μ 'o μ p {t μ 's μ 'p μ ug'nc'pl μ 'r tqdrgo 'o g' v'u.'v'u'o vpf 'v'u' dwaj gv'pi c'pkxgrgv'o μ 'v'u'v'u'uc'ug'uc'r tkgl0

"

Hcmqt k'k'f k'ur qpwgij o μ t k μ 'f j g'hcmqt k'k'ner cekgvk0 Hcmqt k'k'f k'ur qpwgij o μ t k μ ' juj v'u' r μ ts kpf lc'g'nqj μ 's μ 'wtdkpc'juj v'u'x μ tgv'hwpmikppcng'dtgpfc'pl μ 'r gtwkf j g'v'u'ecmwct0

Hcmqt k'k'ner cekgvk'ntc' cuqp'r tqf j ko kp'cmwcn'v'u'v'gto qegpvtcrk'v'i lc'v'u'pl μ 'r gtwkf j g'v'u'ecmwct.'o g' ucuk μ 'g'hws k μ 's μ 'f q'v'u'nkuj vg'r tqf j wct'egpvtcrk'p μ ug'f q'v'u'r wpqpvg'o g'ner cekgv'v'u'r nqv'u'r μ t'v'u' plvlv'p'nqj μ 'f qo gv' μ p μ <

$$H_{\text{ecr}} = \frac{R_{\text{cev}}}{R_{\text{ocz}}} \tag{34}$$

M μ ."

- o H_{ecr} "o' Hcmqt k'k'ner cekgvk'
- o R_{cev} / "hws k'cmwerg'g'r tqf j wct"
- o R_{ocz} / "hws k'p μ 'ner cekgvk'p'o cmko cr'v'u'hwpmikppko k'uj r guj "o g'uj r glv'uk'v'u'gt μ "36"
- o lu'g'o μ 'uj wo μ 0

"

Rut'uj go dwn'plu'wtdkpu'307"O Y "s μ'hwpmukppp'o g'nær cekgv'vu'r nqvu'i lcvu'i lkj μ'nqj μu'r μt'plu' xk'f q'vu'r tqf j qpv<

$$R_{oz} = 3.7 \text{ O Y } = 46 \text{ qtufl kpu } = 587 \text{ f kpu lkv } = 3 \text{ xkv } = 35.362 \text{ O Y j } "$$

O gi lkj cvu.'pi c'gtutcvpqto crkuj v'vu'pft {uj wguj o g.'vu'f j μpcv'g'vl'o wpf 'vu'tgi qlpu'ug'hc'i lpggtwct" xgvuo '7.436"O Y j 0Rtcpf cl.'hcmqt k'k'hær cekgv'vu'vl'f q'vu'kuj vg<"

$$H_{ct} = \frac{R_{ev}}{R_{oz}} = \frac{7.436 \text{ O Y j}}{35.362 \text{ O Y j}} = 206; \text{ "qug'5; " } "$$

I lcvu'i lkj μ'xkkv'| cmqpkuj v'plu'pi ctnguu'r wpg'r tgl'45' "o wpf 'vu'cttkj gv'pu'dtgpf μuk0Mlq'ttkgv'pu" 4: ' "pu'dtgi f gv'f j g'65' "pu'f gv'vu'j cr wt0" "

Rt qf j lo k'xlqvgt "k'gpgti lkpu0'Mwtde" g" hws kpu." mxt" nqo dkpqj gv' o g" uj r μtpf ctlgp" xlgvgtg" vu" uj r glvukpu'vu'gtmu."o wpf 'vu'r μtf qtgv'r μt'vu'r μtecmwct'ug'uc'gpgti lk'o wpf 'vu'r tqf j qlu'plu'wtdkpu" o g'gtμ'i lcvu'plu'xkk0'

Hws kc'pu'±f q'uj r glvuk'vu'gtmu'±uk±'r μtecmqj gv'pi c'mwtde" g'hws kpu+uj wo μl qj gv'o g'pwo tkp" g'qtuxg" pu'xkv's μ'gtc'ht {p'o g'cvu'uj r glvuk0'

$$Q_{tv'z} \text{ "Hws kc" g'wtdkpuu" ? "Gpgti lk" g'r tqf j wct" }$$

"

Uj go dwn' Mqpkf gtqlo μ" wtdkpuu" Xgucuu" X: 4" *wtdkpc" 3087" O Y + "s μ" f q" vu" kpuvcnqj gv' pu" xgpf pf qf j lgp "Lqf j r wt. "kpf k0Mctcmgtkuknev'g'wtdkpuu" Xgucuu" X: 4" lcpu'uk'o μ'r quj vu"<

"

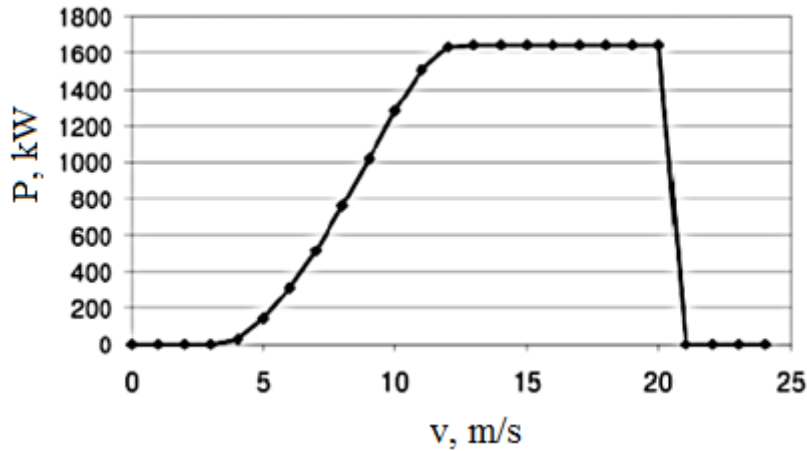
"

Vcd030" Mctcmgtkuknev'g'wtdkpuu" Xgucuu" X: 4"

O qf gr'k'k'Vwtdkpuu"	Xgucuu" X: 4"
Hws kc" g'xrgtμuwct "	3.872'mY "
F kco gvk'	: 4'b "
\ qpc" g'r μthuj kμ"	74: 3'b "
Nctvukc" g's gpf tμu"	9: 'o "72"J +"
Uj r glvukc" g'uj mxt wct "g'gtmu"	507"o lu"
Uj r glvukc" pqo kpcrg" g'xrgtμuwct "g'gtmu"	3502"o lu"
Uj mxt vlo k'k'uj r glvukpu'vu'gtmu"	42"o lu"
F gpf μukc" g'cltkv'	30447'hi lo ⁵ "

"

Μωτdc"g'hws κμ'r μt 'wt dkpμp"Xgucv"X: 4"3087"O Y "μuj vμ'r ctes kwτ"o μ'r quj vμ<



"

Hki 0490Ncmqt lc"g'hws κμ"O qf grk"Xgucv"X: 4+"

"

- Vcpgk"vgqtκnκuj v'hdq"wt dkpμ"o wpf "vμ'i lgpqtqlμ"36.676"O Y j "gpgti lk'±f q"xkv"pμug"mωuj vgv"g" gtμu"o dgvgp"vμ's μpf twguj o g'i lc vμ'i lkj μ'xkκ0'
- Mcr cekgk'k'wt dkpμu"? "3087"O Y "
- P wo tkk'qtμxg"vμ'r wpmu'pμ'xkv"? "46"z"587"?": 982"qtμ"
- Rtcpf cl."tgpf ko gpv'vgqtκnκ'gpgti lkμ"? "3.87"z": 982"? "36.676"O Y j "

"

P μ'r tcmκμ."uj r glvauκ" g"gtμu'pwn'μuj vμ'mwtμ"nqpuvcpv"fg j g"μuj vμ" g"pf t {uj vguj o g"i lc vμ'i lkj μ' nqj μu0'

Rtc."mτ"rkf j gp"qtμv"g"o wpf uj o g"vμ'tgi wctc"pμ'uj r μtpf ctlgp"xlqvτg"o g"tgpf ko gpvκ"pi c"mwt dc" g" hws κμ."o wpf "vμ'xrgtμuj gv'tgpf ko gpvκ'k'o wpf uj μo "dtwq"K'gpgti lkμ'pi c"wt dkpμc"±f q"xkκ0'

"

Qr gt lo κκhμacl'wt dlpg0Vwt dkpμc" f q"vμ'hwgv"o g"uj r glvauκ"5.7"o lu."r qt"tgpf ko gpvκ'k'hws κμ" f q"vμ" lgvμ'uj wo μ'k'wμu0'O g"uj r glvauκμ" g"gtμu"7"o lu."qtμv"g"o wpf uj o g"pμ'xkv"lcpμ"3222"qtμ"pμ'xkv"fg j g" tgpf ko gpvκ'r μtncvμ'k'hws κμ'pμ'ημvμ'r κμ'μuj vμ"3: 2"mY 0Rtc."tgpf ko gpvκ'k'gpgti lkμ"o g"uj r glvauκμ" g"gtμu"7"o lu" f q"vμ'kuj vg"3222"z"3: 2"? "3: 2222"mY j "qug"3: 2"O Y j "

P μ"o μp {tμ"vμ'pi lcuj o g."tgpf ko gpvκ'k'gpgti lkμ"pμ"vμ"i lkj c"uj r glvauκμ" g"vltc"o wpf "vμ'xrgtμuj gv" *tghgtqlvκ'cdgμu"o μ'r quj vμ<

"

Vcd040T gpf ko gpvk'k'Gpgti lkmu.'O Y j "

Uj r glvukc 'g'gt mu' *o lh"	Qt mu'pu'xk'	Hws kc 'hN "	Tgpf ko gpvk' Gpgti lkmu.'O Y j "
6"	; 22"	32"	; "
7"	3222"	3: 2"	3: 2"
8"	3222"	592"	592"
9"	; 22"	722"	672"
: "	: 22"	: 22"	862"
; "	852"	3222"	852"
32"	782"	3472"	922"
33"	622"	37: 2"	854"
34"	522"	3842"	6: 8"
35"	422"	3872"	552"
36"	382"	3872"	486"
37"	: 2"	3872"	354"
38"	62"	3872"	88"
39"	62"	3872"	88"
3: "	42"	3872"	55"
3; "	42"	3872"	55"
Tgpf ko gpvk'bgv'k'gpgti lkmu'pu'xk'			7243"

"

Tgpf ko gpvk'qvcn'bgv'k'gpgti lkmu'pu'xk'f q'vu'kuj vg'7243'O Y j 0'

Hcmqt k'k'nrcckgk0Hcmqt k'k'nrcckgk'vu'plu'vtdkpg'o g'gtmu'juj vu'gpgti lk'vqvcng'xlqvgtg'g' i lpgtwet'r lguuwet'o g'ucukpu'g'gpgti lkmu'smu'wpf'vu'i lpgtqj gv'puug'clq'r wqpp'xc| j f ko kuj v'o g' nrcckgvpqo kpcn'46'qtu'pu'f ku.'587'f ku'pu'xk0Hcmqt k'k'nrcckgk'pu'mvu'tcu'juj vu<"

$$H_{\text{ecr}} = \frac{R_{\text{cev}}}{R_{\text{ocz}}} = \frac{7243'O Y j}{3087'O Y \cdot 982j} = 20695 \text{ 'cr q'5605' "}$$

Mlq'xrgtmu'juj vu'g'ctu{ guj o g'smu'dlg'pu'plu'kpvgtxcn'kr knr tgl'57'f gtk'pu'62' 0'

Qug'o g'hlcnu'vu'vgtc.'xgpf pf qf j lc'lqf j r wt'napuk'gtqj gv'o g'gtmu'vu'o lchwguj o g'r mu'vu'lwukhkvct' kpuvcko kp'g'mucl'vtdkpg'o g'gtmu0'

"

C'luj vu'gpgti lkc'g'gt mu' b g'hquvq'ghgmkgA'Mwt "drkj gv'plu'wtdkpu"o g'gtu.'cpcrk c'g'r gtwkf j mu'vu' mj ko k'luj vu's culc"o mu'g'vj lguj vu'r ut "vu'napvtqmwt "kpxguko gv'wclcO'Rgtkwf j c'g'uj n' gtlgu'luj vu' naj mu' i lcvlc"g'pgxqluj o g'r ut'plu'kpxguko 'r ut "vu'tknw gtwt "uj r gpl ko gv'g'vl'hkngvctg'pu'vgt o c"vu' hsko gxg'qug'mwtuko gxgO'

F wng'r utf qtw "vu'plu'vku'uj go dwn'uk'o mu'r ctu.'r gtwkf j c'g'vj lguj vu'g'uj n' gtlgu'r ut "o qf grkp "Xgucu" X: 4"ner cekgvk3.87'O Y +f q'vu'kuj vg'chutukuj v8.38'xlgv'puug"nquvq'ner kcrq'lcpu'697.222"fqmctmu' fj g'vu'ctf j wtcv'o gucvctg'pi c'r tqf j ko k'k'gpgti lku'lcpu'623.8: 2"fqmctmu"*7243.222"mY j "B "2.2: " f qmctmu'r ut "mY j +0Nnqi ctklglv'lcpu'uk'o mu'r quj vu'<

c0 Mquvqlc'g'drgtlgu'fj g'kpuvcrko k'vu'o qf grk'Xgucu"X: 4"? "3722"fqmctmu'r ut "mY "

d0 Mcr cekgvk'pgo kpcnk'o qf grk'Xgucu"X: 4"? "3087'O Y "qug'3872"mY "

e0 Mquvqlc'ner kcrq'g'wtdkpu'Xgucu"? "3872"z"3722"? "4.697.222"

f0 ¥ o ko k'o gucvct'k'uj klgu'vu'gpgti lku'? "2.2: "fqmctmu'r ut "mY j "

g0 Rtqf j ko k'vqcnk'gpgti lku'pu'xk'? "7243'O Y j "qug'7243222"mY j "

h0 Vu'ctf j wtcv'vqcrq'pi c'uj klc'g'gpgti lku'grgmtknq'? "7243222"z"2.2: "? "6238: 2"fqmctmu'

"

Rgtkwf j c'g'mj ko k<

$$RM = \frac{MV}{CV} = \frac{4697222 \cdot WUF}{6238: 2 \cdot WUF \cdot lkv} = 808 \cdot xlgv"$$

Mw'

MV'o "Mquvqlc'ner kcrq'g'wtdkpu'Xgucu"

CV'o "Vu'ctf j wtcv'vqcrq'pi c'uj klc'g'gpgti lku'grgmtknqO'

"

Nnqi ctklc'"luj vu'plu'r gtwkf j mu'g'vj lguj vu'mj ko kO'Cur gmk' o mu' f qo gv' mu' k' nqi ctklgu" vu' r gtwkf j mu'vu'mj ko k'luj vu'nqi ctklc'g'xngtuuko gxg'tgcrq'vu'vu'ctf j wtcxg.'uj r gpl ko gv'cf o kpkvctvkg." nquvq'g'hwpmikpko k."o kpuo dclvlgu'fj g'tkr ctko k:"±o ko gv'g's kcu'vu'vqmu."cxcpvc| j gv'cvko qtg." vctkcvttgi wncvtg'fj g'vu'r clwguj o utku'vu'i lgrdvt'fj g'r pthsko gv'g'co qtvk ko kOF vj gv'vu'mqi ctkwt" i lkj cuj w'j wo dlgv'g'ghkncukgvk."uk'fj g'j wo dlgv'g'wcpuo gvko k'fj g'uj r utpf ctlgu"o "f kutkdwko k' *V(F +mwt "nqi ctkgv'nquvq'vqcrq'g'r tqpuukuO'

O wpf "vu'r ptecmqj gv'ug'uc"nqj mu'f q'vu'f vj gv's mu'wtdkpc"g'tg'o g'gtu'vu'r ci wclpu'xgv'p'r cuk'vu'nkj gv'k" i lkj mu' "lphqto cekpO'Uk'ttgi wn "±f q'i lu'o mu'g'i lcvu'ug'fj lgvu'xlgv' cnapkuj v'pwnlc'xngp'kpxguko kO'

"

80 P f kmo kp ^ 'O lGf ku'kvwtdrp cxg'v ^ 'gt ^ u'

"

800 P f kno kb lgf kuqt 'klo r kcpvngx'vu'gtmu'

Xkvg'g'hwpf kv."ttklc"g"ner cekgkv'r ut "vu"r tqf j wct"gpgti lk'grgmtkng"pi c"gpgti lk"g"gtmu"ne"s gpm" lcu j vu cnapkuj v"g"uj r glvu."r cuk'su"gpgti lk"g"gtmu"tgf wmqp"pgxqlup"r ut"r tqf j ko kp"g"gpgti lkmu" grgmtkng'f wng'r utf qtwt'dwtko g'vu'vgtc'vu'gpgti lkmu."clq'b wpf 'vu' xqi muqlu'pf kno gv'g'r chcxqtuj o g" o lgf kuqtg'vu'cv{tg'dwtko gxg."uk'r Qij O'pf qvc"cw quhgkng'f j g"v'vkv."f wng"r mthuj km"i c| tcv'ugttmu." f gi tcf ko kp"g'pcv{tmu'r ut'uj nem'vu'i mo ko gxg'r ut'xgpf qulg'vu'wtdkpcxg'f j g'f mo vko kp"g'hwo gplxgO' Rtqf j ko kkgpgti lkmu'grgmtkng'pi c"gpgti lk"g"gtmu'ne"r qvpeknr ut'vu'tgf wmwct'pf kno gv'o lgf kuqtg." ugr ug"pf t {uj g"pi c"i lpgtvcvtmu'su"r utf qtkp"nupf u'f lgi mug'hqukg."pwn'tgl wmqp"pm"i lpgtko kp"g" pf qvuxg"cw quhgkmu'qug'pf qvlg'vgt o kng'f j g"ne"s gpm'vut j gs mug'r ut'uj wo u's gxgk"qti cpk c'v'f j g" kpf kxkf uORqt "vu'vgtmu'lcpu'hqmwuct'pu'pf kno gv'pqi cvxg'o lgf kuqtg'vu'vwtmwctcxg'vu'gpgti lkmu'vu" gtmu."vu'ekcv'r mthuj kpm'pf kno g'xk weng'f j g'vu'vgtc'vgnplgtmu k'f j g'ghmgv'pu'gmukvgo gv."f wng" r mthuj km"o d { vgp"g"nehuj muxg'vu"gi tc."xg±cpmkuj v'uj r gpf muxg'f j g"nemts muxg'vu'pcvu."f kuc"ghmg" o lgf kuqtg'vu'qdlmgxg'vu'gpgti lkmu'vu'gtmu."xg±cpmkuj v'cvq'su'nepu'vu'dulpu'o g'vcpur qtvpO' Rqt."uk'f j g'dwtko gv'g'vgtc'vu'gpgti lkmu."gpgti lk"g"gtmu'ne"plu'pf kno 'pu'o lgf kuOP f kno k'pu'lgvup"g" gi ut'ne"vu'pi lctmu'vu'lgvu'k'wpu'pu'ntcj cuko "o g'hqto cv'g'vgtc'vu'cmkxkgv'plgtmu qt'f j g'kpf wutkenO' O gi lkj cvu."pf kno gv'pqi cvxg'pu'f kuc'ur gekg'vu'pf lguj o g'lcpu'vu'o wpf uj o g'f j g'r mtr lgnlv'r ut'vu" | dwwt"npuq'ghmg'f wj gv'o ctt"r ctcu{uj "pu'hc| pu" g'r rcpknko kOGpgti lk"g"gtmu."uk'±q"cmkxkgv' vlgvut'kpf wutken"o wpf 'vu'uj nemqlu'pf kno g'pu'o lgf ku."vu'ekcv'f wj gv'vu'cpcik qj gp'f j g'vu" dwgpo'

"

800 Rut kno gv'o lgf kuqt g'pi c'vwt dlpcv'g'gtmu''

Ekcv'lcpu'cxcpw/j gv'r ut 'o lgf kkp'pi c'gpgti lk'g'gtmuA'

Mt {gukuj v."gpgti lk"g"gtmu'pwn'uj nemqp"go gvko "pu'vlu'qug"clut"f j g"i lkj cuj w'pwn'r tqf j qp"cuplu" mql"o dgdglg'vqmkngORut"o u'vgr ut."gpgti lk"g"gtmu'pwn'r utf qt"dwtko g'pcv{tqtg"nupxgpekqpcrg"uk" pchc."i c| k'g"vu"pi lcu j o g"f j g'r ut"npu"ctu{g"pwn'f q"vu'uj nemqlu'f mo g"pu"o lgf ku"pwr mo lgv" vcpur qtvp'f j g'pzlgttigu'vu'dwtko gxgO'

Gpgti lk"g"gtmu'pwn'uj vu'xgvuo "plu'vgnpqni lk'g'hcxqtuj o g"r tqf j ko k'vu'gpgti lkmu'grgmtkng'su" tgf wmqp"go gvko gv'vu'pf qvuxg'vu'vgtmu'uk'f j g'EQ4."UQ4'f j g'P Qz+."r qt"i lkj cuj w'uj o cpi "ucuk'vu"

nqpukf gtvguj o g"vu"nquvqvg"vu"lcuj vo g"vu"r tqf j ko k"nqpxgpekqpcn"vu"gpgti lkku"grgmtkng"o g"dc| mu
nqpf mu" f lgi mug" hqukng0

F vj gv"vu"r utf qtgv"i lkj plmu" g"o mu"uj wo mu"gpgti lk" g"gtmu"r ut"vu"r ctepf cwtct"r tqdngo kp" g"pi tqj lgu"
i mqdcng0K r kcpvgv" g"gpgti lkku"vu"gtmu"nqpukf gtqj gp" uk"plu"vgnpqmji lk" g"gpgti lkku"vu"i lgrdmut" ugr ug"
clq"ne" xgvuo "pf knko g"vu" xqi n" pu"o lgf ku0K r kcpvgv" g"gpgti lkku"vu"gtmu"pwnr tqf j qlpu" pf qvu"vu"
cltk"qug"i c| te"ugtmu0

Gpgti lk" g"gtmu"juj vu"plu"gpgti lk'kf gcrng" g'tkr ut vutkvuj o g" ugr ug<

- o ^ uj vu"plu" hqto mu"gpgti lk' r c" pf qvg. "r chwpf mukuj v'g" s mpf tvguj o g"
- o P wni'nut nqpu" nctdwtcpv'
- o P wni'ntklqp" i c| te" ugtmu"
- o P wnr tqf j qp" o dglg" vqmknng" qug" tcf kqcmkxg0

"

8050 Vu'b gvcv'g'r tqf j ko k'vu'gpgti lkku'vu'gtmu'

¥ f q"o mu {tu" g"r tqf j ko k'vu"gpgti lkku"pf knqpu" pu"o lgf ku" pu"plu" hctmu"o mu {tg" f j g"r qcuj wf" j g"gpgti lk"
g"gtmu0Uk"±f q" vgnpqmji lk'vlgvut" gpgti lgvkng. "ko r kcpvgv" g"gtmu"nqpu" f kuc" pf knko g" pu"o lgf ku0Vwtdkpcv"
o g"gtmu" r tcmknkuj v" pwn"uj nemqlpu" go kukqpg" i lcvu" hwpmikqpk k'vu" v{tg" f j g"uj wo mu" r en" i lcvu"
r tqf j ko k" kpuvcrko k" o kmo dclvlgu" f j g" j gslgu" vu" v{tg0 Mrcj cuwct" o g" pf knko kp" o lgf kuqt" vu"
dwtko gxg" tcf kekqpcrg" vu"gpgti lkku. "pf knko k'o lgf kuqt" k'gpgti lkku"vu"gtmu"juj vu" tgrv'xkuj v'k'xqi mu0
K r kcpvgv"o g" wtdkpc"o g"gtmu" pf utvqj gp"uj r guj "pu" vqmu0Ur cwtko k'k'dko mukpu" f j g" i mut {gtlc" g"vqmu"
s mu'nutnqj gv'r ut" ko r kcpvgv" g" wtdkpcxg" vu"gtmu"juj vu"o kpkc n'ntcj cuwct"o g"o kpkgtcv" g" s {o {tk' f j g"
vgo qegpvcrgv"o g" s {o {t0P mug" cvq" ±cmkxk qj gp. "r gk c| j k'o wpf "vu"mj gj gv'r utu'utk'pu" i lgp f lgp" g"
o mu ctuj o g0

Ukf c"nt {guqtg" r ut" r utf qtko kp" g"gtmu" uk' dwtko "gpgti lk'juj vu"ug" gtc"juj vu"o g" pf utr tglg" f j g" pwn"
ht {p" i lkj o qpu" mwt" pgxqlkvg" gpgti lk' grgmtkng0 Gpgti lk" g"gtmu" pwn"o wpf "vu" tvj gv" *r mutxg±" puug"
r utf qtgp" dcvgtkvu"±" f j g" lq" vu" i lkj c" gtmvcv" o wpf "vu" uj ht {vu| qj gp" r ut" vu" r ut o dwuj wt" nqj mu" g"
nutngucxg" r ut" gpgti lk' grgmtkng0

Xgpf gv" g"o ktc" vu"gtmu"uj r guj "pf qf j gp" pu" xgpf g" vu" rcti mu. "rcti "s {vgv'xg" mw" pgxqlkvg" gpgti lk"
grgmtkng0 O gi lkj mug" ko r kcpvgv" g" wtdkpcxg"o g"gtmu" nqpu" plu" pf knko "tgrv'xkuj v'vu" xqi mu' pu"o lgf ku"
pu" mtcj culo "o g" vgo qegpvcrgv" g" vltc" nqpxgpekqpcrg. "gm kvqp" plmu"uj s gvuko "r ut" | j wto mu" g"
r tqf j wct" pi c" nqr cvcv" g" tqvqtv. "pf knko gv" guvgvknng" *xk wcrng" f j g" pi cpluj gtu" | qi lvu"o d {vgp" pi c" vq"

f wng"hnwwtwt"pu"tqvqt0Uj wo kec"gnv{tg'r tqdrigo gxx"lcpu" i lkf j wt"qug"tgf wmwet"pu"o cuu"vu" o cf j g'pur uo lgv| j xkko k'vgnpqm i lknqug"o g'kpuvko kp"gf wj wt"vu"ko r kcpvxxg"vu"gtmu0

"

860 Pf knko gv'gnmqm i knng"

Gn knqlpu" f { "o pu { tc'ht { guqtg'su" j xkko k'k'gpgti lku"vu"gtmu"o wpf "vu"pf knqlpu"pu"ut wmwup" f j g" hwpmikqpk o kp"g'gnqukvgo k/"pur uo lgv'pf knko gxx"vu" f tglv utf tglv"pu"qti cpk o cv'kpf kxf wcu" f j g" pur uo lgv'pf knko gxx"pu"ut wmwup" f j g'hwpmikqpk o kp"gj cdkcvk0P f knko gv'o lgf kuqtg"vu"ko r kcpvxxg" vu"r tqf j ko k'vu"gpgti lku"grgmknng"r uo gu"gpgti lku"vu"gtmu"o wpf "vu"uwf kaj gp"s u"pi c"uj nenc" g" i lgtu" g'pf knko k'vu"plu"vwdkpg"pu"r gk c| j . "tgi lkq" f j g'r rcpv'f g'k'uj nemp" g" i lgtu" f j g"vu"pi wuj vu" vu"pf knko k'vu"v{tg'pu"ut wmwu"vu"j cdkcvk'cr q'o pu { tu"vu"lgvuu"vu"ur gekxg0P f knko gv'gnmqm i knng" vu"vwdkpcxxg"vu"gtmu"lcpu"nqo r rmg" f j g"o wpf "vu"pf t { uj qlpu"o g"nqj pu. "xgpf pf qf j lgp."uvkpu." o qvp. "mqkp" g'gnqukvgo k."ur gekv' f j g"hcmtu"vu"vgtmu0Vwdkpcv"o g"gtu"uj nemqlpu"o d { vlg"vu" uj r gpf uxg" f j g'rcmks uxg"vu"pcvu"r uo gu"r utr reulgu."o g'uj wo u"i lcuc"pi c'nqr cvv'g'vwdkpu0" Rutecmko k'k'ghgmkv"vu"o cf j uku"vu"vwdkpu"pu"ttgl knw" g'uj r gpf uxg'nutnq"o u"uj wo u"vu" f j mpc" pi c'ntcj cuko k'kf tglv utf tglvu" k'xf gnlxxg"pi c'plu"uutmu"mlguj "vwdkpcuj 0P f utvko kf j g"o kpuo dclvc" g'ko r kcpvxxg"vu"gpgti lku"vu"gtmu"i lkj cuj w'pf t { uj qp"ut wmwup" g'gnqukvgo k'r uo gu"ur cutko k'vu" dko uku. "i utt { gtlgu"vu"vqmu" f j g'r qvpekrk'r ut "gtq| kq" f j g" | j wto u0P f t { uj ko k'k'dko uku. "f wng" r mthuj km" r cutko kp" g" r { lxxg." r mthcs uup" pf quj v" pf t { uj ko kp" o u" vu" t'upf ukuj uo " r qvpekn" pur uo lgv'htci o gpko k'f j g" j wo dlgu"vu"j cdkcvk"r ut "f kuc"ur gekg0P f t { uj ko gv"pu"ut wmwup" g" r { lxxg" f j g" mtkko k'k'j cr lxxg" pf t { uj qlpu"o kntqmk mu" f j g" | xqi muqlpu"r { mu| ko kp0Dko mu" f j g" nchuj mu'dtgp c'plu"gnqukvgo ktgci qlpu"pf t { uj g'pf cl'nuv{tg'pf t { uj ko gxxg0O wpf "vu"ngvu"i lkj cuj w' pf utxgr tko g'vu"t'upf ukuj o g'o k'ku'pf t { uj ko k'vu"j cdkcvk'f j g'ttgl knw"vu"xf gnlxxg."vu"vkc"uk'ulgm" g'rcmks uxg"vu"pcvu"r tcpu"vwdkpcxxg0

"

870 Pf knko khwwtqt"

Ko r kcpv'g'gpgti lku"vu"gtmu"ntklqlpu"pf knko g'tgmtcvxxg'r q| kxxg" f j g'pgi cvxxg0P i c'cpc"r q| kxxg." uj wo u'r tqlgmg"vu"gpgti lku"vu"gtmu"t'gpf kgp'ukt' co lg'wt kunkng"<f kuc"qhtqlpu"vtpg"/"xk k'c"qug"qhtqlpu" | qpc" kphqto cekqk" ttgy " qdlgmk" f j g" gpgti lku" vu" gtmu" pu" r uti lkj uk0 Gn knqlpu" f { " mlg" vu" pf knko gxx" vu"o wpf uj o g" pgi cvxxg" pu"o wpf ukvu" tgmtcvxxg"< vu" f tglv utf tglv" f j g" vu" utvj qtv0 Pf knko gv'gf tglv utf tglv"o wpf "vu"tgl vnxqlpu"hw"cmkxkgv'gm knwgug'tgmtcvxxg"qug"r utlcuj vqj gp" qug"nutnqlpu"pf t { uj ko "vu"ttwi mu"r uttgj "plu"ko r kcpv"vu" gpgti lku"vu"gtmu0P f knko gv'kpf kmg"

r mthuj klpµ"pf knko g"guvgkng"sµ"o wpf "vu"pf knqµ"pµ"r µtxqlµp"tgntgcvkxg0Mµvq"pf knko g"o wpf "vu" pf qf j kµ"nwt"xrgtcv'r kmqtgung"qug"pcv{tqtg"lcpµ"ntkknng"r µt "r µtxqlµp"tgntgcvkxg0P µ"pcrcik ko kµ" g" pf knko gxg"pµ"xgpf gv'j kvqtkng."vu"uj gplvc"f j g"ctngqrqi lknng."uj s gvµuko k'nt { guqt "µuj vu"ug"pwnif vj gv' dµµ"cupµ"µo "kr µtj gtuj µo "sµ"t q"vu"pf knqµ"pµ"kvgi tkvgkµ" g"l qpµo

"

800 Pf knko kµµ'lgvµp'g'plgtkw'

Rtqlgmvgv'g"gpgti lkµ"µ"gtµµ"o wpf "vu"ngpµ"pf knko g'r q| kxg'r qt"gf j g"pgi cvkxg"pµ"uj µpf gvµ" f j g" o kµs gpkgp" g"plgtµ| xg0P f knko gv'r q| kxg"ttkxgp"nt { gukuj v'pµr µto lgv'r µto kµuko gxg"pµ"ekµukµ" g" cltk0Mµvq"pf knko g'r q| kxg"r µt "uj µpf gvµ" f j g"o kµs gpkgp"lcpµ"vu"uj r µtpf ctc="cvq"r µtlgvqj gp"pi c" plgtµ| k's µ"lgvqlµ"pµ"l qpc"mw'o gvqf cv'nµpxgpekqpcrg"vu"r tqf j ko k'vu"gpgti lkµ"grgmtknng"r µtf qtgp" o µ'r cm'ugr ug"gpgti lkc" g"gtµµ"o wpf "vu"l µxgpf µµqj gv'pµ"tgi wp"tclqpcr0P µ"vu"mwµf µt v."pµ"o cupµ"sµ" r tqlgmvgv'g"gpgti lkµ"µ"gtµµ"ntklqµ"pf knko g"pgi cvkxg"pµ"uj µpf gvµ" f j g"o kµs gpkgp" g"plgtµ| xg." pf knko gv'r µtlgvqj gp"nt { gukuj v'pi c"plgtµ| k's µ"lgvqlµ"r tcpu"wtlpcxg"o g"gtµ"sµ"pf knqj gp"pi c" | j wto c" f j g'j klc0

"

800 Pf knko kµµ'ngµpµqo kni'

Rtqlgmvgv'g"gpgti lkµ"µ"gtµµ"o wpf "vu"ngpµ"pµ"µµµ"pf knko guj "gnµpµo knng" f j g" hknng."r q| kxg" f j g" pgi cvkxg0F luc"pi c"µµvq"pf knko g"pf kj gp"pµ"pkxgn"µµo dµvct"qug"tclqpcr="µµvq"r mthuj klpµ."ntgf k' vko qtg" f j g"vko vl"vu"lgtµ"o qpµvctµ"r µt "vu"kpµwtclwct"r tqf j ko kµ" g"gpgti lkµ"µ"gtµµ."ukf j g"ghgmvgv' g"gpgti lkµ"µ"gtµµ"pµ"±o ko gv'tclqpcrg"vu"gpgti lkµo

"

800 Pf knko kxk' wcrf'

Rgtegr vko gv" g" r gk' c | j k' f j g" pf knko gv' xk' wcrng"lcpµ" ±µuj vlg"m{±g" o lgf kuqtg" pµ" r µtecµko kµ" g" cr rknko gxg"vu"ko r kcpvkg"vu"gtµµ"sµ"rkf j gp"o g" | j xknko kµ" g"gpgti lkµ"µ"gtµµ."r cuk'pf knko gv" g" r gk' c | j k' f j g"cvq"xk' wcrng"lcpµ"pi c"pcv{tc"uwdlgmkxg" f j g"pf t { uj qlµ"o g"nknko kµ" g"µµj µµ" f j g" xgpf pf qf j lgu0

Mctcmgtkµkµv'g" | j xknko gxg"vu"gtµµ"o wpf "vu"uj ncmqµµ"ghgmvg"pµ"r gk' c | j " f j g"xk' wcrkuj v0Mµvq" nctcmgtkµkµe"r mthuj klpµ"wtlpcv"±o cf j µukc."retµukc."pwo tk"o cvgtkcrk' f j g"pi l { tc±."pf µtvgucv" g" pµµucekqpµxg." µµo r qpko gv" ttlgk" rkf j lc." uj v{µv" g" cpµo qo gvtk' f j g" rkpµv' g" vcpµo gvko k0 Mctcmgtkµkµµ"vlgµt" g" r cts gxg"o g"gtµ"µµj vu"ug"cvq"pwnilcpµ"vu"r µtj gtuj o g."pf cl" | qpc"mw"µµj vu" xgpf quwt"r ctµw'o g"gtµ"o wpf "vu"µj gj gv'pµ"i lgpµ lgp" g"ucl"qtki lkpcrg"r cu'hc| µµ"µ" f gµµo kukpko k0"

"

80 0P f knko Kc mwakni'k' j wto mu'

\ j wto c"pi c"pu"hwuj pu" g" wtdkpcxg" u"gtmu"nc" s gpu"plu"pi c"pf knko gv'o lgf kuqtg"o u"vu"uwf kwctc"u" mucl"vgnpqm i lkg0\ j wto c."ntcj cuwct"o g"pf knko gv'g'r gk c| j k'f j g'xk wcr g."o wpf "u"o cvg'f j g"u" r ctcuj knaj gv'o lch'rgj u0'

Cuj w'uk'o g"af q"o cnkpu" s u" r mthuj kp" r lguu" naxk mug." wtdkpcv" g"gtmu" i lgpqtqlpu" | j wto u" i lcvu" hwpmikpko k0\ j wto c"pi c" wtdkpcv" g"gtmu" rkp" nt { gukuj v'pi c" f { "dwtko g<3+" | j wto c"o gncpkng" g" uj nemwct" pi c"mwk" g"uj r glvuuku" f j g" i lgpqtcvqtk=" f j g"4+" | j wto c" cgtqf kpc o kn g" g"uj nemwct" pi c" pf utxgr tko k'kr cvcxg" u" wtdkpuu" o g"gtmu'0'

Rutxqlc" g" hkwct" pu" | j xknko kp" g" ko r kcpvsg" o g"gtmu" uwi lgtq" s u" | j wto c"pi c" wtdkpcv" o g"gtmu" uuj u" r uti lkj mukuj v'uj wo u" g" wru0' Mtcj culo k' o kf ku" pwo tkv" u" cpngucxg" r ut" | j wto cv' r ut" ko r kcpvsg" g" wtdkpcxg" u"gtmu" f j g" r ut" mqlgv" g" vlgte" u" | j wto cxg" vgi qp" ug" | j wto c" g" v' tg" uuj u" plu" r tqdrgo "k" uj nemu" u" xqi un' pu" vto c" cduqnwu0' kphqto cekpk' pi c" UJ DC " uwi lgtq" i lkj kuj w'ug" cpngucv' r ut" | j wto pu" pi c" r tqlgmv" g"gtmu" lcpu" u" ttcnc" f j g" | cnupkuj v' o wpf " u" | i lkf j gp" pu" o pu" { tu" u" nupcs uj o g0'

"

8020 P f knko Kpu' r ut f qt ko kp' g' vqmu'

Cwqtksgv' pf utmqo duxctg" g" nupukf gtqlpu" | j xknko kp" g" ko r kcpvsg" o g"gtmu" pu" r qikknv" g" v' tg" u" r rcpkknko k' r ut" r tqlgmv" g" gpgti lku" u" gtmu'0'

Xgpf ko gv' f vj gv' u" o gttgp" f wng" o cttu" r ctcu { uj " r ut f qt wgu" g" vlgte" u" vqmu" m' r rcpkknaj gv' u" xgpf qugp" wtdkpcv'0' Rcpkknwgu" tclqpcu" f j g" nncu" u" r ut f qt ko k' u" vqmu" f vj gv' u" xgpf qukp" puug" plu" r tqlgm' uuj u" k' r clwguj mu " o g" r ut f qt ko gv' gm' kwwug" f j g" u" r rcpkknwctc" hspkg. " puug" ck' f q" u" o qf kknqu" pgi cvxkuj v'netcmgtk" g" r uti lkj uj mu " u" | qpuu" r uttgj . " puug" f q" u" r tkuj u" hqo wpxgvg" g" ntkwctc0' Ttg i wrcv' g" r rcpkknko k' u" r ut f qt ko k' u" vqmu" pu" f kuc" xgpf g" tgnqo cpf qlpu" uj o cpi kcp" g" | qpcxg" o g" go utko g' u" o dtqlwct0'

"

8030 Tgf wnk o Kkpf kno k' pgi cvk' b lgf kuqt 'k' gpgti lku' u' gt mu'

P f knko gv' pgi cvxg" o lgf kuqtg" pi c" kpuerko gv' g" gpgti lku" u' gtmu" lcpu" uj wo u" o u" u" wruv' pu" kpvpuksv" uguc" cv' u" r tqf j wctc" pi c" gpgti lku" nupxgpekqpcrg. " r qt " cv" gpf g" f vj gv' u" xrgtmuuj gp" f j g" u" | dwgp" mwt" uuj u" g" pexqluj o g0' Gm' kuqlpu" mwuj vg' ur gekkn g" s u" f vj gv' u" gm' kuqlpu" r utr ctc" ug" plu" | qpu" u"

nəpukf gtəj g'v'g'r utuj wəwuj o g'r ut' | j xknko kə'g'plu'r ctnw'o g'wtdkpc'v'gtu0Məvq'mwuj v'g'r mthuj klpu'
hcməqtu'v'u'vkn'uk'knko c.'mwhk ko g'v'qr qi tchng.'nqi lkrkng'f j g'gnəqni lkn0'

P lu'xrgtəuko "utcvgi lkn'o lgf kuqt" *XUO + "juj v'u'r tqegf wtc" g' r utf qt w' r ut' v'u'xrgtəuwct" pf knko g'
pgi cvkxg'v'u'f q' r ncpk'f j g' r tqi tco k'pu'o lgf ku0S gxgkəu'nəo dūvctg."tclqpcrg'f j g'rqncrg'f vj g'v'u'
pf utə cttkp"XUO 'r ut' v'u'i lkj c'r ncpv'f j g' r tqi tco g'v'gpgti lku'u'gtəu's u'həpu'r qvpekn'r ut' ghgmng'
v'u'tupf uukuj o g'o lgf kuqtg0P f knko g'v'gnəqni lkn'v'u'qdlgməxg'v'u'gpgti lku'u'gtəu'lcpu'nəo r rəng'
f j g'o vpf "v'u'pft {uj qlpu'o g'uj nənpu'j cr uukpqtg'f j g'nəj qtg.'xgpf pf qf j lgp.'v'kəp.'o qv'k.'mllk'g'
gnəukəvgo k.'ur gekv'f j g'hcməqtu'v'u'vgtəu0Rut" o u'vgr ut.'uj wə u'pi c"pf knko g'v'lcpu'v'u'o vpf uj o g'
mwo wcvkxg'f j g'pf knko g'v'gnəqni lkn'g'o vpf "v'u'pft xgr tq'pu'pu'o pu{tc"nəo r rəng'pu'qdlgməv'g'
gpgti lku'u'gtəu'f j g'pu'xgpf g'v'u'vgtc's u'rk'j gp'o g'r tcmknəv'g'pft {uj wtc'v'u'r utf qtəo k'v'u'vənu'
f j g'uj s gəuko g'v'u'vgtc"cpvqr qi lgp0'Rut" u'j nən'v'u'nu'kl"nəo r rəng'v'k'xrgtəuko k'k'pf knko gxg'
gnəqni lkn'v'u'j xknko k'v'u'gpgti lku'u'gtəu'juj v'u'v'k'v'g'u'f j g'o dūj v'v'v'pu'v'u'mw wctk'g'hcməqtəxg'
s u'lcpu'uwf kwct'pu'o pu{t'v'u'r co lchwəuj o g0Rcxctəukuj v'nu'cl.'f kuc'o qf grg'nəpu'hknwct'v'u'f c'k'p'
pi c"kphtəo cəkəpk'k'f kur qpəwuj uə "cmwənkuj v0Ttklc" g'nutnko k'f wəg' r utf qt w' o g'v'f c"tki qtə| g'
uj n'pəqtg' f q' v'u' l'g'v'u' ntkkng' r ut' r n'v'uko k'p' g' dūj n'p' gxg' g'n' kuwəg' v'u' kphtəo cəkəpk' f j g'
r utə k'uko k'p'g'dgəwəuj o utku'u'r ctcuj knko gxg0'

Uk' r mthəpf ko ." f vj g'v' v'u' xgpf quko " s u' puug' f vj g'v' v'u' r tqf j qlə u' gpgti lk' g'ngm'kn'g." r cvlgvut' v'
r tqf j qlə u'cv'pu'plu'o pu{t'v'u'v'u'ngv'u'pf knko "uc'o u'v'u'xqi u'v'pu'o lgf ku0P i c'r knur co lc'v'gnpkn'g'
f j g'gnəpəo kn'g.'h'qto c'o u'g'xlgvut'g'gpgti lku'u'v'k'p'xwəuj o g'f j g'\$v'u'r cvut\$'juj v'u'gpgti lk'g'gtəu0'
Clq'o vpf "v'u'nəp'v'kdəqlu'pu'o pu{t'v'u'ghgməxg'pu'v'v'k'ko k'p'g'pft {uj ko gxg'mko cvkng.'f wəg'qhtwct'pu'
v'u'plulv'p'nəj u'r mthkko g'v'u'pft {uj o g'o lgf kuqtg."u'ekərg'f j g'gnəpəo kn'g0P i c"cp'v'lgvut.'juj v'u'g'
pəxqluj o g'v'u'o k'p'ko k'qj g'v'pf knko k'k'gpgti lku'u'gtəu.'xg±cp'utkuj v'pu'cur gm'k'p'o lgf kuqt" *v'cl'v'c" g'
| q'pəxg'v'u'o dtqlwct+f j g'uj pu'f g'v'p'g'plgtkw" *j wto c'f j g'pf knko k'xk' wəv'0'

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90 O QFGNKO KFJ G'UKO WNKO KKVWTDKP CXG'V^ 'GT^ U'

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90B0Rt qlgmko kkvwt dlpcxg'vu'gt ju'

"

90B0 Rt qlgmko kkvwt dlpcxg'vu'gt ju'b g'e'mi'xgt vknen'

"

Vwt dlpc'o g'gtmu'o g'dquj v'xgt vknen'pu'cr rnklo gv'wt dcpgo Gpgti lk" g"gtmu'juj vu"plu"hgto mu" g" r tqxwct'nqo gtekrkuj v'fj g'o g'ttklg"vu'uj r glvu"vu'r tqf j ko k'vu'gpgti lku'grgmtknqo Vwt dlpcv'o g'gtmu' qhtqlpu'gpgti lk'grgmtknq"vu'r cuvut. "vu'tkpqxwguj o g'fj g'o g'nquvq'ghgmkg"pu'o dctu'dquvp'fj g'r q" duj gp"uj r glv'plu"vgnpqmji lk'nt { guqtg" g"gpgti lku"vu'tkpqxwguj o g'r cu'gpgti lku" f kgmqtg" *f kgmkv#0 Mrcukknko k'kr tcpwct "k'plu'wtdkpg"o g'gtmu' lgr gv'pi c" dquj v'k'kucl" k'qtkgpvko kv"uk'wtdkpu"o g'gtmu"o g" dquj v'j qtk qpvcn*VGDJ + "qug'uk'wtdkpu"o g'gtmu"o g'dquj v'xgt vknen*VGDX+0

Vwt dlpcv'g"gtmu"o g"vtg"vgj g'o g'dquj v'j qtk qpvcn'lcpu"mwf q. "f wng"s gpm'plu"fk clp"kr tqxwct" f j g" k" dguwct'bo g'plu'j kvqt k'vu'i lcvu'r mtuqulgij 'fj g'r mto kmuo guj 0VGDJ /vu'r mtf qtgp'i lgtmu'uj v'pu'i twr g" vu"o mf j c"vu"hgto cxg"o g'gtmu'pu"vu'i lkj mu'huj cvk. "uk'fj g'pu'r tqlgmg"vu"j cr wct"pu'f gv'vu"j cr wt "nw" nuxk l c"gtmu'juj vu"o mu" g'r cuvut. "o mu" g' hqtvu'fj g'g'r cvtc| wct"]37_0

O gi lkj cvu. "r mu"uj ncn'vu'pf m'v'gucxg"vu'rcv. "r go mxg" f j g" ut wnwctcxg"vu"o mf j c"vu"ntkvwct"pi c" plgtkw. "o qf grkf j g'tlfg j c" g'gtmu'tgy' s { v'v'g'fj g' qpcxg'wtdcpg'juj vu"o mu'r cmg'r ctcuj kmwuj o g." o mu'h'c'v'ng'fj g'r m'v'wtdw'g'p'ec0Mlq'k'dup'fk clpgv'g'bo mf j c'j qtk qpvcg'vu'wtdkpcxg'bo g'gtmu'c'gtqhqk' o mu'r cm'gh'ncug'pu' qpcv'wtdcpg'fj g'i l {uo mu'wtdcpg'0

Vwt dlpcv'o g'gtmu"o g'dquj v'xgt vknen"qug"uj m'v'VGDX. "lcpu"o mu'vtj gs mu'g'fj g'o mu'vu'r mtuj v'wuj o g" r mu'r mtf qtko "pu"s { v'v'g'fj g'o l'gf kug'wtdcpg'mw'tt { o c" g'gtmu'juj vu"o mu'r cmg'r ctcuj kmwuj o g0Mlq" g" d'up"VGDX"plu" | i l'gf j l'g'uj wo mu"o mu"vu"o kmu'r mu'kpuv'cko kp"pu"v'qmu'fj g'kgug"o qpko kp"pu'pf m'v'guc" f j g" ±cvk"vu"ekcv'r m'p'f t { u'j g'f q"vu"mwk' q'kp" kpuv'cko kp" g" ut wnwctcxg"o mu"vu'rcv"vu" wtdkpcxg" j qtk qpvcg'0

I lkj cuj wv. "m' "ml"i l'g'p'g'v'qt k'wtdkpcxg"o g'gtmu'juj vu"ki lkj mf tglvko uj mu" s"mu'f q"vu"v'j qvu'ug"pwn' m'ut'np'qtkgpvko "vu'h'g'v'xg'pu'gtmu"s mu'xlgp. "r cu'k'uk' cu'f k' clpk'vu'vd. "ck'i lkj o qpm'g' h'ut'np'00 mu'r cu." VGDX/vu'pwn'ncpu' h'ut'nguc'vu'nqo r rknwct'r mu'uj o cpi kg'qug'dkuj v'p'r mu'v'w'uki wvct"s mu'clq'vu'lgvu" i lkj o qpm'pu'f tglvko kp" g'f vj wt0

Rlguutkuj v'r ut "uj nem'vu'f k' clpk'vu'v{tg'vu'y'lguj vu'vu'vgj w'xgtvnen'o g'hutnko "vu'wuv.wtdkpcv'o g" dquj v'xgtvnen'nepu'plu'uj r glvuuk'tgrv'xkuj v'vu'wuv'vu'pf utr tglgu'uu'gtmu"*ew'kp'+f wng'k'nglwt'cvq" vu' hwpmikppqlpu" mwt' lcpu" vu' ttgy wetc" pi c" pf utvuc" fj g" kphcutvnmwtc." r exctmuukuj v' pi c" metcmgtkuvne'vqug'f tglvko KK'gtmuOP lu'cxcpvc| j 'vlgvut'k'wtdkpcxg'o g'gtmu'o g"dquj v'xgtvnen'juj vu'ug" cvq'b wpf 'vu'r q| lekqpqj gp'chut'r knuu'vu'r utf qtko kv'f wng'tgf vnmwt'pi ctnguu'pu'±q'k'phcutvnmwtmu" gn' kuwug'vu'ttlgv'f wng'r tqo qxvct's mpf twgij o utkpu'f wng'tgf vnmwt'±q'uj s gvuko "o lgf kuqt0 "

Rt qlgmko gv'g'wtdkpcxg'b g'gt mu'b g'dquj v'xgtvnen'oGpgti lke'nerp'pup ut'o lgf ku'uk'plu'tt {o mu'qug" ttlgf j lg"gtmu0'Ucuk"o cmiko crg" g'hws ku's mu'±q'wtdkpu"o g'gtmu'o wpf "vu'pzlgttu'pi c'gtc"xctgv" uj wo mu'pi c'mqlk'f k' clpk'f j g'xgpf pf qf j lc"gu'cl0'Vwtdkpcv'g'gtmu"j qtk' qpvcng'pzlgttk'gpgti lk'f wng" pi cf cnuwct'gtup"j {tug'f wng'r utf qtwt'vgj gv'g'tqvtk'vu'uc10P mug'f juj ktqp'vu'ngvu'322' "ghkneukgv" r ut'vc"du'vu'vu'vgj gv'g'tqvtk'f q"vu'f vj gv'vu'pf cmqlpu'322' "vu'gtmu."i lu's mu'pwn'juj vu'g'o wpf vt" s ctvu0'

Vwtdkpcv'o g'gtmu"o g"dquj v'xgtvnen'r pthcs muqlpu"plu"mql"vu'tk'vu'vgnpqmji lku"vu"i lgpgtko kv'vu" gpgti lkuu."k'r tqlgmwct"r ut'plu'tgi "o mu'vu'xqi mu'wtdcp0P mu'r uti lkj muk"VGDX/vu'f q"vu'nkuj kp'plu" pf knko "o lch'vu'wuv'xk' wcn'f j g'o lgf kuqt'ttgy' pf utvucxg'r cuk'cvq'lcpu"o mu'vu'uj mwt'vc'pu'netvuuk'ug" wtdkpcv'vcf lekqpcng"j qtk' qpvcng"vu"gtmu0'I lkj cuj wv."nqo r qpqpvu'g"v{tg'nt {guqtmu"vu'r wpuu."uk" i lgpgtcvqtk'f j g"mwkc" g"uj r glvuukuu."lcpu"vu" xgpf quwct"o mu'chut" vqmu" f wng" mutmwt"o mu'r cni" o duuj vgvug'vnmwtqtg0Mlq'g'dup'o lch'vu'ngj vu"o kmu dclvdp.'kpur gmko kp'f j g'tkr ctko kp'g'hu'v{tg" i lgpgtcvqtmxg'vu'wtdkpcxg0'

Vwtdkpcv'o g'gtmu"o g"dquj v'xgtvnen'ttqwmnj gp'ttgy' "plu'dquj vkr'kpi wno g'gtup'f wng'r utf qtwt'plu" utmu"o qf gruj "vu'pf t {uj o g0Hgvu'ttqwmngug."i qvc'vqug"o qf grgv'g'ttcj muk'vu'xg| mxg'lcpu'vcuj o mu" uj wo mu'vu'f kur qpwgij o g.'ugek'no g'cxcpvc| j gv'f j g'f kucxcpvc| j gv'g'xgv0'

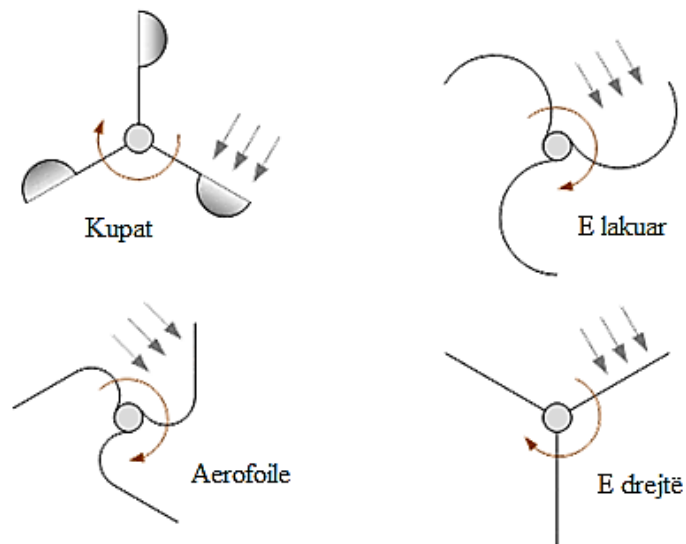
Hkrko kuj v.'vnmwtcv'g'wtdkpcxg'o g'dquj v'xgtvnen'wr' utf qtup'r ut'r qo r ko kp'g'wkv'f j g'wklgp'g'vu" nqttcxg'pu'xgpf g'vu'neti mc"o g'gtmu's mu'ht {pvg'pi c'±q'f tglvko 'f j g'o g'uj r glvuuk'vu'wuv'Uqv."VGDX/ vu'lcpu'plu'| i lk'j lg'ghkneug'r ut'v'wr' utf qtwt'pu'| qpvc'g'pf utwctc'hw'gtc'juj vu'g'r cs mpf twgij o g'o g" f k' clpk'g"VGDX/vu'vu'ne'vgi qtk' wct'pu'f { 'mqlg'nt { guqtg<

- F k' clpu'Ucxqpkwu"*o g'pi culg'pi c'| xcttklc'+f j g"
- F cttkgwu"*o g'pi culg'pi c'pi tklc-0'

"

F k' c' l' p' k' k' w' t' d' l' p' u' i' b' g' g' t' u' U' c' x' q' p' k' u' F k' c' l' p' k' k' w' t' d' l' p' u' i' o' g' g' t' u' U' c' x' q' p' k' u' k' g' o' u' t' w' e' t' u' k' r' c' u' l' i' j' r' k' m' u' k' v' u' u' c' l' h' p' r' e' p' f' g' l' + u' j' u' i' u' u' p' l' u' f' k' c' l' p' k' y' l' g' u' j' u' i' k' d' c' | w' e' t' p' u' r' c' t' k' o' k' p' g' \$ | x' c' t' t' k' l' g' u' f' k' h' g' t' g' p' e' k' c' r' e' g' \$ O' T' q' v' t' k' U' c' x' q' p' k' u' r' u' t' f' q' t' f' { " c' g' t' q' h' q' k' e' " i' l' { u' o' u' e' k' k' p' f' t' k' n' g' u' i' n' q' o' r' g' p' u' w' e' t' . " i' l' { u' o' u' e' k' k' p' f' t' c' " q' u' g' h' k' z' j' c' p' u' . " u' o' q' p' w' e' t' t' t' g' y' " p' l' u' d' q' u' j' v' k' x' g' t' v' k' n' e' r' u' i' p' i' l' e' u' j' u' o' " b' g' o' q' f' g' r' k' p' g' t' u' t' f' q' t' w' e' t' p' i' c' e' p' g' o' q' o' g' v' e' v' g' u' j' r' g' l' v' u' k' u' u' u' u' g' t' u' o' "

P' u' b' u' p' { t' u' v' k' r' k' n' g' . b' o' q' f' g' r' e' v' g' U' c' x' q' p' k' u' r' u' t' d' i' j' g' p' p' i' c' f' { " q' u' g' t' g' i' q' v' e' . v' e' u' c' r' u' t' u' g' m' i' k' q' p' . q' u' g' f' { " i' l' { u' o' u' e' k' k' p' f' t' c' u' i' f' t' g' l' w' e' t' " p' u' f' t' g' l' v' o' g' u' i' n' w' p' f' u' t' v' e' o' g' g' t' u' p' . " p' u' o' u' p' { t' u' s' u' c' v' q' u' i' h' q' t' o' q' l' p' u' p' l' u' i' n' q' l' " o' q' f' g' r' k' p' u' h' q' t' o' u' \$ U \$ u' d' e' u' j' n' e' p' i' l' k' w' t' " p' u' p' l' u' d' q' u' j' v' x' g' t' v' k' n' e' r' O' M' l' q' f' q' u' i' y' q' u' u' g' o' w' p' f' u' i' t' t' q' w' m' u' j' g' v' x' g' v' o' " p' u' p' l' u' f' t' g' l' v' o' " u' k' e' v' t' g' i' q' j' g' v' p' u' h' i' w' t' u' p' " 4: 0



H' k' i' 04: 0' N' r' l' g' v' g' f' k' c' l' p' k' u' i' t' q' v' t' k' u' i' w' t' d' l' p' u' i' U' c' x' q' p' k' u' i

V' w' t' d' l' p' e' v' U' c' x' q' p' k' u' i' r' w' p' q' l' p' u' f' w' n' g' g' f' t' g' l' w' e' t' " g' t' u' p' p' i' c' r' l' g' u' e' g' r' c' u' o' g' g' c' p' u' u' n' a' p' n' e' x' g' u' i' n' w' r' c' x' g' q' u' g' e' k' k' p' f' t' e' x' g' p' u' p' l' u' t' u' p' c' p' u' f' j' g' p' u' d' t' g' p' f' u' k' u' i' c' p' u' u' n' a' p' x' g' m' i' g' u' i' n' w' r' c' x' g' p' u' c' p' u' p' v' l' g' v' u' t' O' M' l' f' t' g' l' v' o' " k' g' t' u' u' p' f' u' t' o' l' g' v' i' n' w' r' c' x' g' q' u' g' i' l' { u' o' u' e' k' k' p' f' t' e' x' g' t' g' l' w' n' q' p' u' i' u' x' k' l' g' f' j' g' t' t' q' w' m' i' k' o' t' t' g' y' " d' q' u' j' v' k' x' g' t' v' k' n' e' r' u' i' d' e' u' j' n' e' p' i' l' k' w' t' O' "

O' u' r' c' u' . w' t' d' l' p' e' v' U' c' x' q' p' k' u' i' h' w' p' m' i' k' q' p' l' p' u' r' u' t' o' g' u' r' c' t' k' o' k' v' u' u' t' j' g' s' l' g' u' / " | x' c' t' t' k' l' g' u' r' c' u' k' n' w' r' c' v' n' e' p' u' o' u' r' c' n' i' u' t' j' g' s' l' g' n' w' t' t' t' q' w' m' u' j' g' p' p' u' f' t' g' l' v' o' " u' i' g' t' u' u' f' j' g' o' u' i' j' w' o' u' i' u' t' j' g' s' l' g' n' w' t' t' t' q' w' m' u' j' g' p' n' w' p' f' u' t' g' t' u' u' O' M' l' " g' h' g' m' k' h' q' t' e' c' x' g' u' i' p' f' t' { u' j' o' g' t' t' k' v' g' v' i' c' i' n' u' x' k' l' e' " g' g' t' u' u' f' j' g' c' l' t' k' o' k' f' k' u' f' { " q' u' g' t' g' + m' w' r' c' x' g' . "

i lu" s mu" ttks" ttqwnko kp" nuxk mu" vu" dquj vk" r mu" r mu" f qtlo " pu" r tqf j ko kp" g" gpgti lkuu" grgmtkng" qug" r qo r ko kp" g" wlk0'

O gi lkj c vu. 'r mu" uj menug' cvq' r wqqlpu' xgvuo ' pu' r ctlo kp" g' vu" t j gs lgu. ' cvq' lcpu' r mu" i lkj mu" kuj v' o mu' r cni' ghncug' ug' o qf grgv' g' vgtc' " VGDX" r cuk' xgvuo ' ttgyj " 47" f g tk' pu' 52' " g' hws kpu' u' f kur qpwguy o g' pu' gtmu" o wpf " vu' pzlgtg' v' o g' uwmigu0'

Cxcpwcl j k' nt { guqt " k' f k clpk' vu" tqvqt k' Ucxqpku" mu" j vu" ug" mu" j vu" u" j wo mu" k' r j vu" r mu" v' w' ttqwnmct0' Uj r glvuuk' g' ucl' g' pcv' tuj o g' g' wpu' v' g' gtmu" o g' p' f mu" r t g' tlg' * ew/ kp+ f j g' tcr qt v' k' k' wpu' v' k' u' j r glvuukpu" o clg" g' rglqp' cvu' vu' pzlgttu" gpgti lk' pi c " f q" g' tu" lq/ f tglwugug0' mu" j w' w' mu" j vu' k' r mu" tuj v' cu" j mu" o ' r mu" vu' q' r gtwt" pu' u" j wo mu' xgp' f g' wtdcp' g' o g' u' j r glvuuk' vu' wpu' v' vu' g' tu" mu. ' uk' f j g' f tglvko g' vu' p' f t { u" j wgu" j o g' vu' g' tu" mu0'

Vwtdkpcv' g' g' tu" mu" o g' dquj v' xgt v' knen' vu" tqvqt k' Ucxqpku" lcpu' wtdkpc' vu" v' j lgu" j v. " o g' o k' mu" o dclvlg' vu" wpu. ' vu' e' kn' v' o wpf " vu' r mu" f qt gp' pu' er r' kn' c' ek' qp' g' s' mu' p' wni' mu" t' na' j lpu' u" j wo mu' r tqf j ko " vu' gpgti lkuu" 00 qf grgv' u" j vu' r k' ng' vu" tqvqt k' Ucxqpku" lcpu' d' mu" i' lkj cu" j w' pi c' f { ' i l { uo c' vu' p' lu' h' n' e' | cp' x' cl' k' r' mu" er r' kn' ko g' vu" v' j lgu" j v' vu' r qo r ko k' vu' wlk' l' cu" j vu" t' l' g' v' k' 0' Rqt " er r' kn' ko k' o mu' k' | cn' qp' u" j mu" k' p' lu' tqvqt k' Ucxqpku" mu" j vu" r mu" f qtlo k' k' v' t' g' pu' cp' go qo g' v' c' v' g' u' j r glvuukpu" u' g' tu" mu" s' mu" o cvk' p' u' j r glvuukpu" g' g' tu" mu" 0'

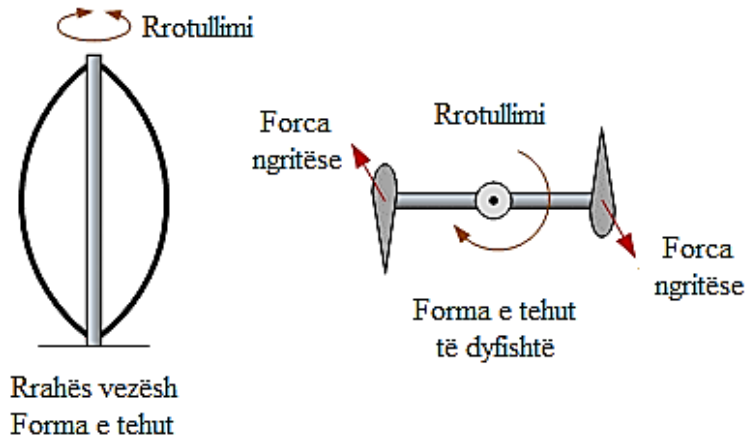
"

Rt qlgmko k' k' wtdkpu' o g' g' tu' F cttlgwu' Tqvt k' k' wtdkpu" o g' g' tu' F cttlgwu" * k' go mu" wct " ukr cu" u" j r knuuk' vu' w' l' t' c' p' e' g' l' + r mu" f qt' f { " qug' v' g' hg' vu" qug' hg' vu' vu' j' qm' c' g' t' q' h' k' i' s' mu' f' w' ng' p' uk' v' g' j g' x' g' t' v' kn' e' ng' qug' p' lu' f' k' clp' pu' h' q' to mu' t' t' c' j mu' k' x' g' l' g' vu' o qp' wct' pu' p' lu' d' qu" j v' x' g' t' v' kn' e' n' 0' Vg' j g' v' pu' h' q' to mu' c' g' t' q' h' k' i' k' l' c' pu" vu' r q' l' k' e' k' p' w' c' t' e' j' q' t' k' q' p' v' c' n' u' j v' t' t' g' y' " d' qu" j vk' s' g' p' f' t' q' t. " mu" j w' s' mu" q' h' t' q' l' pu" r g' h' q' to c' p' e' mu" o mu" vu" o k' mu" c' g' t' q' f' k' p' c' o k' ng' f' j g' p' lu' f' k' clp' u" j wo mu" o mu" vu' v' j lgu" j vu' u' g' tqvqt k' Ucxqpku" 0' Tqvt k' o wpf " vu' r mu" d' mu" j g' v' pi c' f { . ' vt' g' qug' o mu' u" j wo mu' v' g' j g' vu' f' t' g' l' v. " vu' n' c' m' w' c' t' e' " qug' pu' h' q' to mu' c' g' t' q' h' k' i' d' t' g' p' f' c' f' k' clpk' vu' w' l' 0' f { " v' g' j g' vu' f' t' g' l' v' c' p' l' k' j g' p' | cn' qp' k' u" j v' uk' h' q' p' h' i' w' t' ko k' k' v' g' j w' J' 0'

Tqvt k' F cttlgwu" r wq' qp" pu" r ctlo kp" g' hqtec' x' g' pi t' k' mu" g' * vu" pi l' cu" j o g' o g' t' q' v' t' k' p' j' q' t' k' q' p' v' c' n' u' vu" c' g' t' q' h' k' i' k' s' o g' h' v' t' t' q' w' n' w' g' u' o c' m' u' k' o c' n' h' u' x' k' mu' vu' r tqf j wct' m' w' t' h' g' v' u' v' g' h' q' to mu' h' u' x' k' kp' pu' r mu" g' tu" mu" o mu" u" j r gl' v' u' g' u' j r gl' vuuk' g' g' tu" mu" 0' Ml' q' f' q' vu' v' j q' vu' u' g' c' v' c' o wpf " vu' p' zl' g' t' t' k' p' o mu' u" j wo mu' gpgti lk' vu' r mu" f' qt' u" j o g' pi c' g' t' c' r' mu" t' p' luuk' vu' | qp' pu' u' mu' h' u' j k' mu' p' f' t' { u" j g' pi c' t' q' v' t' k' Ucxqpku" 0'

P f mu" uc' ttqwnm' j g' v' pu' p' lu' t' t' w' i mu' t' t' g' y' q' t' g' pu' r mu" t' c' l' mu. " f q" v' g' j " n' t' k' l' q' p' lu' h' q' t' e' mu" vu" x' q' i mu' p' i t' k' mu" g' s' mu" t' g' l' w' n' q' p' pu' p' lu' + h' v' t' t' q' w' n' w' g' u' r' q' l' k' k' x' pu' t' q' v' t' vu" pi l' cu" j mu" o " o g' h' q' t' e' c' v' c' g' t' q' f' k' p' c' o k' ng' pu' n' t' c' j w' p' g' c' x' k' q' p' k' . f' j g' u' c' o mu' g' o c' f' j g' vu' l' g' vu' h' q' t' e' c' pi t' k' mu" g' c' s' o mu' k' o c' f' j ' mu" j vu' t' t' q' w' n' ko k' 0' H' s' k' e' o g' n' e' p' k' n' g' k' l' g' r g' v' d' qu" j vk' s' g' p' f' t' q' t' pi c' p' lu' h' q' t' e' mu" w' c' p' i l' g' p' e' k' n' g' g' e' k' r' g' v' t' c' puo g' v' q' p' h' w' s' k' pu' v' g' i l' g' p' g' t' c' v' q' t' k' g' r' g' m' t' k' n' i' o mu' r qu" j vu" 0'

"



"

"

Hki 04; 0Nnqlgv'g'r tqlgmko k'vu'tqvtk'vu'wtdkpuu'F cttkgwu"

"

P f t { u j g " p i c ' t q v t k ' k ' o m r c t u j m o " U c x q p k w u . ' p l m ' t q v t ' k ' r c u v u t ' F c t t k g w u ' p w n ' i u j v u ' p l m ' o c n k p u ' x g v / p f k j m u g . ' n u j w ' s m ' n u t n u p ' p l m ' o g n e p k j m o ' v u ' l e u j v o ' r m t ' c ' x u p u ' p m ' r w p u ' h n k o k u j v 0 M l q ' i u j v u ' u g ' t q v t k ' v u j o m ' f v j g v ' v u ' l g v u ' f w n g ' w ' t t q w m w c t ' r m t r c t c ' u g ' g t c ' v u ' o w p f ' v u ' w u j v t q l m ' p l m ' h q t e u ' n u x k j m u g ' o d k ' v u 0 P m ' r m t i l k j m u k ' p l m ' t q v t ' k ' x q i m ' U c x q p k w u ' i u j v u ' k ' l p n u r q t w c t ' p m ' d q u j v p ' n t { g u q t ' F c t t k g w u ' r m t ' v u ' u k i w t w c t ' h k v ' t t q w m w g u k p ' g ' n u t m w c t ' v u ' h n k o k v ' o g ' u j r g l v u k ' v u ' w n u c 0

C x c p w l j k ' k ' f k c l p k ' v u ' t q v t k ' F c t t k g w u ' i u j v u ' u g . ' r c u k ' i l e v u ' n u x k j l g u . ' c k ' o w p f ' v u ' t t q w m w j g v ' o g ' p l m ' u j r g l v u k ' o l e h v ' v u ' r c t v u . ' f w n g ' r t q f j w c t ' o m ' u j w o m ' h w s k ' p m ' f c n l g ' u g ' t q v t k ' U c x q p k w u 0 F k u c ' f k c l p g ' n u q o g t e k r g ' v u ' p l x g r k v ' v u ' r c t v u ' v u ' v g j w ' v u ' w t d k p u u ' o g ' g t m ' x g t v k n e r g ' l e p m ' x c t w t ' r m t ' n u p f g ' v u ' p f t { u j w g u j o g ' v u ' r l g t t m u k u . ' v u ' e k r v ' o g ' u j r g l v u k ' v u ' r c t v u ' t t q w m w g u g ' n u x k j k p ' r q l k e k p l p ' r m t ' u j n e n i v u ' h q t e c x g ' e g p v t k h w i c n g ' f j g | x q i m u q l p m ' u j r g l v u k p m ' g ' t t q w m k o k v ' f w n g ' g r k o k p w c t ' n u j w ' t t g l k n w p ' g ' u j r g l v u k u ' u m ' v g r m t v 0

"

908040 Rt qlgmko kKwt dlpcxg'vu'gt mu'v g'v'mij qt k qpvcn'

Xctkcdrcv'g'r t qlgmko k0"

R u t e c m k o k k ' x c t k c d r e x g ' f j g ' r e t c o g v c x g ' v u ' w t d k p u u ' u m ' g t m u ' n e ' p l m ' t u p f m u k ' v u ' o c f j g ' p m ' h q t o w i k o k p ' g ' p l m ' o q f g r k ' q r v o k k o k ' v u ' r t q l g m k o k v '] 3 8 _ 0 P m ' h c m x ' p l m ' w t d k p m ' o g ' g t m ' i u j v u ' p l m ' t t l g v ' k ' p f m t r k m w c t "

Kr utdutu'pi c'o klut'grgo gpv'u'p'f utrk'j w00 gi lksj cvu.'plu'p'f ctlg'g'ukungo k'o vpf 'vu'p'f kj o qlu'pu'
kf gpv'k'ko k'p'g'xctkdr'xg'o u'vu'tupf ukuj uo 'vu'r tqlgmko k'r ut "± q'pupukungo 0'

Nkuc'g'o ur quj vo g'v'gi qp'xctkdr'v'nt { guqtg'vu'r tqlgmko k'vu'pupukungo gxg'vu'wtdkpcxg'o g'gtu."
o g'vj gmu'pu'xctkdr'v's u'hk'j gp'o g'utwmtcv'g'vgj w'f j g'mwmu0'

Xctkdr'v'g'tqvtk<

- Xctkdr'v'nt { guqtg<"
 - o F lco gvk'ko cf j ukc'g'tqvtkv"
 - o Xgpf pf qf j lc'pu'hk'j lg'o g'mwmp'±r 0'j 0'tqvtk'r etc'uj v{ mu'cr q'r cu'uj v{ mu+ "
 - o P wo tk'vgj gxg'±plu.'f { "qug'v'g+ "
- Xctkdr'v'g'vgj w<"
 - o Rctes klc'g'r uti lksj uj o g'±i lcvuk'o'uj r utpf ctlc'g'hqtf mu'f j g'g'mj guu'o'mupf k' k'mpkv0'
 - o Ugmukpk'vut vj qt'±pf ut vko "'o'mqlk'ck'hqk+ "
 - o Nkf j lc'Vgj "/J wd'±i l{uo u'g'ct vkwvct'/'r mqvukuj v'g'ct vkwvct'/'r c'o gpvguj c+0'
 - o O cvgtkrk'k'pf ut vko k'±mqo r ql kc'cnwo k'p'o'±grkno'v'gmukno' g'hkg's grs k'gvl00' "
- Xctkdr'v'o dmu'v'g'v'v'±'j vd ldquj v<"
 - o Nrqlk'k'uj r utpf ctuk'±hku'/'K'r utmwmt+ "
 - o Nrqlk'k'muj kpgcxg"
 - o P f ut vko k'f j g'f ko gpukppgv'g'dquj v<" "
- Nrqlk'k'o qpko k'vu'dquj v'vu'tqvtk'p'mwkpμ'g'uj r glvukμ0'

Xctkdr'v'g'tcpuo g'ko k'vu'hws hku<

- Mwkc'g'lpi tpc| j k<"
 - o Nrqlk'±r 0'j 0'dquj v'r ctergn'r rpgvct.'gvl00'
 - o O cf j ukc'f j g'mqlk'k'xguj lgu"
 - o Ter qt v'k'lpi tpc| j gxg"

"

/ I lgpqtcvqtK<

- Nrlk*lpf wmlqp. "ukpntqp. "o ci pgy'kr utj gtuj mo ."gvl00'
- Mctcmgtkuknev'o gncpknq"f j g"vu"r gthqto cpepu"*rkf j lc"±kv"ttqwnwgu/uj r glvuk"
hws kc"q"xngtµuwct. "gvl0"

"

Xctkdrv'g'lkngo kv'u'hqpv qnk<

- Mqpvtknk'k'ttqwnko kv'u'tqvtkv'
- Mqpvtknk'kj cr kv'u'vgj w'

"

Xctkdrv'g'Pcegnv<

- Mqphki wko k"f ko gpukqpv."pf utvko k"o qpko k"o cvgtkrk"gv0'

"

Xctkdrv'g'hwmµk<

- Nrlk*r ncmµ/"wdc"/"uj v{µµ'o g'i wkf µ±"
- Rctco gtecv'g'r ctes klgu"*rctvukc. "i lgtµuk±"
- Nrlk'k'ugmikqpk'vu"vutvj qtvu"
- O cvgtkrk'k'pf utvko kv"*±grkm"dgvpq. "gvl0"

"

P lµ"fk clp"K'uwnguj µo "k'wtdkµµ"o g"gtµ"f vj gv"µ"uki wtqlµ"hwpmikqpk'o kp"ghkneµ."vu"uki wt v"f j g" gnqppqo kn'vu"o cnkµµ0'CK'f vj gv"µ"uki wtqlµ"cmigu"vu"ngj vu"r µt"o kµo dclvlgp"f j g"vtepur qtvp"f j g" pi tkvlgp" g"ngj vu"vu"nqo r qpgrvuxg"f j g"pµpµqo r qpgrvuxg"vu"ukvgo k0'O qf grgv" g"o kc" f vj gv"µ" r µthuj klµ"xg±qt'k'gungvng"vu"hqto µµ'µµ'r µti lkj uj o g'vu"o cnkµµ0'P µ'hcµv."pwn'ne"ntkgtg"vu"vj lguj v" r µt"o cvlgp" g"i twr kv'µ"qdlgmkkcxg"vu"o µukr µto 0'O gi lkj cµµ. "f vj gv'r tcvpwt"ug'uwnguk'kr tqlgmko kv' utvwnwtqt" f vj gv'µ"i l{ nqj gv'pi c"uj ncmc"pµ'vu'ekµp"cttkj gv'hwpmikqpk'nt { guqt "k'wtdkµµ"µµ"gtµµ0'

Cpck c" g"nqvqu"ner kcrq" xctgv"pi c" | j xkrko k'k'xngtµuko gxg"ucvuknqg"vu"nqvqu. "vu"ekcv'rkf j kp" rctco gtecv'f j g"xctkdrv'g"pft{uj µo "vu"r tqlgmko kv'µ"vtdkµµ"o g'nqvqp"vqcrq"vu"ucl"ner kcrq"qug"

naqvaq'g'pupukugo k'vu'bc10Xctkdrv'o mu'tupf mukuj mo 'vu'r tqlgmko k's mu'ncpu'plu'pf knko 'pu'naqvaq'
g'ukugo k'vu'wtdkpcxg'o g'gtu'lcpru'

- O cf j muk'g'tqvtkv'
- Hws kc'g'xrgtmuwct "
- Uj r glvauk'g'xrgtmuwct'g'gtu"
- Lgc'g'r tkuj o g'g'uj utdlo k'vu'o cnkpu"
- Ucu'k'g'r tqf j ko k'
- Nrlkf j g'o cvgtkrk'k'pf utvko k'vu'nao r qpgpvaxg'vu'pf t {uj mo "
- Uj neme'g'r utf qtlo k'vu'o cnkpu"
- Nrlk'ki lpgtvcvtk'f j g'ukugo g'g'vcpuo gvko k'vu'gpgti lku"

"

P mu'r uti lkj muk'o cnkpgtku'g'gtu'o g'tcr qtvg'o mu'vu'rcv'vu'xrgtmuwctc'pf cl'uj r glvauku'vu'pf utr tglgu"
j {tuug'o vpf 'vu'r tqf j qlpu'o mu'uj wo mu'gpgti lkf j g'vu'ngpu'hcmtmu'ncr cekgv'ko mu'vu'rcv'vu'. 'r qt. 'r ut'hc'
vu'ngs. "cv'na'uj vqlpu'o mu'uj wo mu' i lgf j lc'g'tcr qtv'qr vko cn'vu'xrgtmuwct'o g'uj r glvauku'vu'o gucvctg"
vu'gtu"mu'j vu'i lkj cuj w'plu'nao r tqo ku'hcmtmu'g'ncr cekgv'vu'rcv'vu'lcpru'vu'f kur qpvuguj mo "pu"
uj r glvauk'vu'vpu'vu'xrgtmuwctc. 'r qt'f q'vu'r tqf j qj gv'o mu'r cn'gpgti lk'Uj r glvauk'g'xrgtmuwct'xctgv"
pi c'cr knko k'ur gekkn'k'pi ctnguu'f j g'o cf j muk'g'tqvtkv.'pf utuc'uj r glvauk'g'r tglgu'xctgv'pi c"
f k'clpkk'ukugo k'o gncpknif j g'vu'vcpuo gvko k'vu'gpgti lku'00 cnkpgtku'o g'j cr lg'vu'pf t {uj vguj o g"
o vpf 'vu'ttgi wmlpu'napf gv'g'vgj w'o g'gtup'pu'o mp {tu's mu'vu'ncr kp'o mu'uj wo mu'gpgti lk'pu'plu'i co mu"
vu'i lgtu'uj r glvaukuj "vu'gtu'00 gi lkj cvu. "naqvalc'f q'vu'uj ncmqj gv'pu'ukugo g'g'pgxqluj o g'vu"
napvtqnko'

O cmuko k'ko k'r tqf j ko k'xlgvt"vu'gpgti lku"o vpf "vu'cttkj gv'f vng"o cmuko k'vct"naqhlekpv'g"
hws ku'vu'tqvtkv.'Er'0F kuc'cwqtu'ncpu'uwf kvct'hqto c'qr vko crg'vu'vgj w'r ut'o cmuko k'ko kp'g'Er. "g"
ekc. "r ut" plu' xrgtu" vu' r mtecmwct" vu' tcr qtv'ko o clu'uj r glvauk' vu' r tqlgmko k' *uj r glvauk"
ttqwmvgug, ttgl lc'uj r glvauk'g'gtu'xctgv'pi c'xctkdrv'g'o mu'quj vu'o 'vu'r tqlgmko k'<

- Nrlk'k'ugmikqpk'o g'ngvu'cltqtg'v'cr qtv'ENIEF+
- Mqphki wlo k'k'vgj w'f j g'uj r utpf etlc'g'naqf mu"
- P f t {uj ko 'kr utf tgf j lgu'vu'vgj w'
- P wo tk'vgj gxg'f 0j 0'pi wvauk'g'tqvtkv'+

"

T g| wncv'g'qr vko k ko k'vtgi qlpu'ug<

- Uc"o μ" k' rctv" v" lgv" tcr qt v' pi tkv" pf cl" vtj gs lgu." cs "o μ" k' o kμ" μuj v" r gthqto cpec" cgtqf kpc o kn'g'o cnpμo"
- Uc"o μ" k'o cf j "v" lgv" pwo tk'v'g'j w." cs "o μ" k'o kμ" μuj v" r gthqto cpecO
- Gm' kvqp" plμ" xngtμ" qr vko cng" r μt " nqghk'g'p v" g" hms kv" pμ" plμ" tcr qt v' v" ecmwct" o clg/ uj r glvukg. 'k's wclwt' tcr qt v' k'o clμ/uj r glvuk'g'r tqlgmko kO

"

Mppuf gtcwv'g't guj μoP lμ'vgnpqrqi lk'g'r μto kμuwct' f q'v' t'g| wncv'g'pμ'plμ'f k clp'v' r'g'j v. 'k'ekr' nt {gp' hwpmkqpk' g'u {p wct' pμ" o μp {tμ' ghk'cugO' Rguj c' g' r'g'j v" i lkj kuj w'pzk' f kuc' qdlgmkc' v" v'gtμ" uk' nquv' o μ" g' wμ'v' f j g' nctcmgtk'v'k'v' o μ" v" o k'c' v" r gthqto cpeμo' Rtcpf cl. "o k'pko k ko k'k' r guj μu" utwμwtqtg" o wpf "v" o gttg'v' uk' plμ" nt kgt' k' f qdkuj μo " r μt" o cvlgp" g' uwmuguk' v" plμ" r tqlgmko k' v" wtdkpu' b g' g' tμ' O' Mlq' f q' v' r μt huj kv'g' uk' m'w'p' v' kuj w'gf j g' v'g'j g' v' t' q' w' w' g' u' g' r' cuk' c' v' l' c' p' r' μt d' μt' μuk' nt {guqtμ' utwμwtqtμ' v" o cnpμo' Rguj c' g' n'qo r qp'gp' v' x' c' t' g' v' p' i c' o cvgtk' r' k' k' p' f μt vko k. "f ko gpuk' p' g' v' f j g' n'q' p' h' i w' t' k' o k' O

Lgv' g' h' f' j lgu' v" n'qo r qp'gp' v' x' g' nt {guqtμ' utwμwtqtμ' f vj g' v' v" l' g' v" g' o lchw'g' u' j o g' r μt "v" r' g' l' w' c' t" r tqf j ko k' p' g' g' p' g' t' i lkμ' v" o lchw'g' u' j o g' r μt "v" d' c' r' p' e' w' c' t' k' p' x' g' u' k' o k' p' h' k' g' u' v' c' t' O' R' μt' c' h' μt' u' k' u' j v' i l { u' o c' g' f μuj vko g' x' g' v' u' j n' c' m' w' c' t' e' p' i c' n' q' f' j l' c' p' f' q' f' j μ' p' p' μ" o q' p' v' k' o k' p' g' t' q' v' t' k' o' M' l' q' μ' u' j v" g' r' t' k' u' j o g' u' g' r' u' g' t' q' v' t' k' μ' u' j v" utwμwtc" nt {guqtg. " g' ekc" v' c' p' u' h' t' q' p' p' i c' t' n' g' u' c' v' g' g' t' μ' u' v' g' m' n' q' o r q' p' g' p' v' u' v' g' v' l' g' t' μ' utwμwtqtμ' O

Xctk' d' r' v' g' r tqlgmko k' v' v" p' g' x' q' l' u' j μo " r μt" r c' t' c' u' j k' n' k' o k' p' g' l' g' v' i l' c' v' u' k' u' μ' u' n' q' f' j l' g' u' o w' p' f " v" m' c' u' k' h' k' u' j g' p' u' k' o μ' r' q' u' j v' u' <

- Mctcmgtk'v'k'v'v' g' v' u' j r glvuk' v' u' v' g' t' μ' u' v' u' | q' p' u' u'
- P k' x' g' r' v' g' h' q' t' e' μ' u' v' o c' v' g' t' k' r' k' v' f' j g' h' c' m' q' t' μ' v' g' u' k' i w' t' k' u' u'
- Uj r μt p' f' c' t' l' c' v' c' v' k' v' k' n' q' t' g' g' p' k' x' g' r' x' g' v' u' v' t' g' u' k' v'

"

Fk' clp' k' t' μ' f' t' k' f' j l' g' b' k' p' o c' n' g' O T g' f' v' m' k' o k' l' q' u' g' h' a' p' v' t' q' n' k' k' f' t' k' f' j l' g' x' g' v' u' n' q' o r q' p' g' p' v' u' x' g' utwμwtqtμ' v" wtdkpu' b g' g' t' μ' μ' u' j v' p' l' μ' n' μ' p' u' k' f' g' t' c' v' μ' g' t' u' p' f' μ' u' k' u' j o g' g' r' tqlgmko k' O' F' t' k' f' j l' c' o w' p' f " v' u' p' f' k' n' q' l' μ' u' j w' o μ' p' μ' r' t' c' p' k' o k' p' n' q' o g' t' e' k' r' v' u' o c' n' p' μ' u' r' μt " u' j n' c' m' v' u' g' h' g' m' x' g' v' u' v' k' l' p' g' i c' v' x' g' p' μ' r' g' t' h' q' t' o c' p' e' μ. " n' q' u' v' ."

uvcdkxgv."lgvui lcvaak'vu'nfj j lgu'fj g' j wto uO'Ghmg'vu'vkr'vu'r cf juj kvctc"duj gp"o u'vu'vj gmvctc"
pu'tcukp"g'wtdkpcxg'vu'gtmu'vu'o cfj g'o g'dquj v'j qtk qpvcn"vu'ekrcv'ncpu'xg±qtkpu'vpkng'vu'vgj gxg"
ttqwmwug'vu'j qmc'vu'o qpwtc'pu'hvnc'vu'rcvc'hngmklpuo'

"

O lgf kuf j g'mwk ko gv'g'ukvo kOMc"uj wo u'mwk ko g'su'mwk qlpu'r tqlgmko kp."rtqf j ko kp'fj g"
hvpmlkqpk ko g'wtdkpcxg'o g'gtmuO u'vu'tupf ukuj o gvr'tgl'v'tg'lcpu'fj pu'o u'r quj vu<

- Nqlk'kr rnkko k'r Qj Or tqf j ko k'k'gpsti lkpu'grgmtkng+
- Mwuj vgv'g'xgpf pf qf j lgu"xgpf pf qf j lc."nctcmgtkuvncv'g'uj r gl'vukpu'vu'gtmu."r tglc"g'gtmu."
pkgrk'k' wtdwrgpevu."| qpc"g'f kur qpwguj o g."stcpur qtvk"mwuj vgv'g'vqvu."ukvo k'rqnc'k'
gpsti lkpu'grgmtkng."gvo"
- Dwzj gvk'kr tqlgmkv'fj g'mwk ko gv'hkpcpektg"
- Mwk ko gv'vgnpqmi lkg'fj g'vu'r tqf j ko k'
- Chvukvu'g'hvs ku'r vpuvtg'fj g'r utxqlup'g'r tqlgmko k'
- F kur qpwguj o utk"g'mqlxg'vu'ecmwctc'vu'o cvgtkrgxg"
- Mutngucv'g'uki vtku."hqeju'fj g'pi vvuuku"
- Mutngucv'f kpc kng'fj g'uvcdkxgv'vu'vu'i lkj u'vwmwtvu"
- Mutngucv'g'r gthqto cpevu"
- Rtdrgo k'k'qr vko k ko k'vu'ukvo k'vu'wtdkpcxg"o g'gtmu'juj vu'ck'k'i lglgu"vu'xrgcxg"vu"
xctkdrxg"vu'r tqlgmko k."vu'ekrcv'cttkpu"o u'vu"o k'k'qdlgmxcv'g'ukvo k'fj g."pf utnqj u."
r nquuqlpu'vu'i lkj c'mwk ko gv'g'r tqlgmko kO'

"

Cngtpevxcv'f j g' i lk j lgv'g'f k clpkOMc'f emko g'vu'lcuj vu| cnpuj o g'o kf ku'wtdkpcxg'vu'gtmu'o g"
dqj v'j qtk qpvcn"pu'xctpu'vu'o cfj ukpu'vu'tqvtk'fj g'cr rnkko k'ur gekh'vu'gpsti lkpu'O gi lkj cvu."
pft{uj ko gvr'uthuj kj gp"pu'ncvqi qtku'g'r uti lkj uj o g'vu'r tqlgmko k'r ut'wtdkpcv'su'qr gtqlpu'pu'vu"
plvlv'p'o lgf ku'fj g'r ut'vu'plvlv'p'cr rnkko O'Dc| vct'pu'qdlgmxcv'g'r ut| i lgf j vtc'vu'r tqlgmko k'juj vu"
g'o vpw'vu'kf gpv'k'ngj gp'plu'utmu| i lkj lguj "vu'r tqlgmko k'su'f tglvqj gp'pi c' i lgf j lc"g'xctkdrxg"
nt{guqtg'vu'r tqlgmko kO'Vedgr "5"lgr "f kuc"pi c"cngtpevxcv'su'ncpu'vu'dupmu"o g'f k clpgv'g'vgj gxg"
fj g'vwrcxgO'

"

Vedgn "50Cngtpevkxv'r mt'fk clpgv'g'vgj g'xg'f'j g'nwmxg"

\ i l f j l c 'g' r t q l g m k o k ' ' "		Ghgmvg'p'u'qdl gmkxcv'g'ukugo k' "
*3+" O cf j muk' g'tqvqtk'	*c+'Kxqi mu'	Rtqf wmkxkgv'k'wmu'k'gpgti lkmu.'r guj mu'g'rgj vu.'pkxgrg'vu'wmu'f' t k f j l guj . 'lgvu'g'i lcvu'g'o cnkpuu0'
	*d+'Ko cf j "	Gpgti lk'g'rcv'vu.'r guj mu'g'o cf j g.'nquvq'g'rcv'vu.'f' t k f j l g'vu'rcv'vu'f' j g'pi ctnguc'rqf j lglg0'
*4+" Rqj lekqpk' k'tqvqtk'	*c+'Rctc'uj v{muu'	\ j wto c" g" wmu'f' j g" lgvui lcvuukc" g" i lcvu'g" r q f j l g u " * R c " g h g m g " v u " j k l g u " u " m w m u + " n q u v l c " g " n q p v t q n k " t t k g v ' * n u t n q j g v p i c u l c " g " t t q w n k o k v + " n e " r t q d r g o " o g ' r c u v t k o k p " g " n w m u 0 ' "
	*d+'Rcu'uj v{muu'	G' j wto uj o g' * j k l g' m w n g + " x q i m u p p ' n q u v q p " g " n q p v t q n k " * n e r k o " r c ' r c i g u + " P w n h e " r t q d r g o g ' o g ' r c u v t k o k p " g " v g j w w ' u " n w m u 0 ' "
*5+" P t 0' k vgj g'xg"	*c+'P lu'	O mu' r c n i r q r w m q t . ' k l j w t o u j m o " * h q t e c " v u ' r c d c r p e w c t c + " o m u' r c n i h e r l g ' g p g t i l k g . ' o m u' g ' h k m u . ' g ' h g j v u ' r m t ' v w p i t k w t 0 ' "
	*d+'F { "	\ x q i m u p p ' n q u v q p " g " t c p u o g v k o k v . ' l g v u " g " i l c v u ' r q f j l g l g ' f j g ' f t k f j l g ' v u ' w m u " * o g ' s g p f m t ' v u ' r m t m w m t + " n q u v l c " g " p f m t v k o k v ' u ' s g p f t m u ' u j v u ' g ' r c v u 0 ' "
	*e+'Vtg"	O mu' u j w o m u' n e r l g " g p g t i l k g . " o m u' u j w o m u' r g u j m u' v g j . " n q u v q " g " w m u ' g " p f m t v k o k v ' u ' s g p f t m u . " h q t e c " z j k t q u n q r k n g " v u ' d c r p e w c t c . " o m u' g u v g k n g 0 ' "
*6+" Mqpkpi w'k' vgj w'	*c+'Rc'Rtgeqpg"	O mu' u j w o m u' g p g t i l k ' p i c t n g u c " v u ' r c v " e k m k n g " * l g v u " o m u' g ' u j m w t v u t " g " r q f j l g u + 0 ' "
	*d+'O g'Rtgeqpg"	Rguj c'g'rgj vu.'lgvu'g'i lcvu'rqf j lglg" * x q i m u p p k p i c t n g u c v g ' r m t n w l g u " p u ' t t m p l u p " g " v g j w w 0 ' "
*7+" O cvgtkcnk' k'vgj w'	*c+'Gr qmuk'f' t w k'	Rguj c'g'rgj vu.'lgvu'g'i lcvu.'nquvq'g'rcv'vu'g'xgi r'xg.'pi w'vauk'g'wmu'0'
	*d+' Rqrkguvt " k' r mthqtewct " o g' zj co " * I TR + "	Rguj mu'g'rgj vu.'nquvq'vu'rcv'vu'vu'xgi r'xg.'vu' b w p f u j o g' r m t " v u ' h q t o w c t " h q t o c " n q o r r e m u g 0 ' "
	*e+'Y grknw'	Mquvq'g'wmu'vu'xgi r'xg'/" r guj mu' b mu'g' t m p f m u . ' p i w t v a u k ' g ' r c v u . ' v g n p q n j i l k ' u v d k r g 0 ' "
	*f+'Cmno kpk'	Rguj mu'g'rgj vu.'pi w'vauk'g'rcv'vu'0'
*8+" Nnqllk' k' mwmu"	*c+'Ttlgyu' * x c t i + "	Vt e p u r q t v k f j g ' p i t k l c " g " r k t m u ' f j g " g ' r g j v u " / " h q t e m u ' f j g ' p i w t v a u k ' g ' r c v u 0 ' P l u ' v u t j g s l g " g " f q d m v x k w e r g " / " c m i g u ' k l c u j v u o " p u ' n u m u h " / " g h g m g " v u " j k l g u " u " m w m u " u " r c v u 0 ' "
	*d+'Vwdwrtg"	Vu' u j v t g p l c " / " o m u' g u v g k n g " / " o m u' r c n i g h g m g " v u " j k l g u " u " m w m u " / " c m i g u ' k d t g p f u j m o " p u ' n u m u h 0 ' "
	*e+'Mwnc'g'i w'gf "	Rguj c'g'wmu'/" nquvq'g'wmu'/" f t k f j l g ' g ' r c v u " * u j w o m u' g ' d w m + " / " o m u' r c n i g ' p l q j w t 0 ' "
	*f+'Dgvqpk'	O w p f " v u ' l g v u ' g n q p q o k n g ' r m t " w t d k p e v ' g ' o m f j c ' o g ' g t m 0 ' "

90850 F cmo kb kf ku'wtdkpcxg'b g'gtmu'vu'dquj v'j qt k qpvcnf j g'c'vll 'xgt vkncl'

"

Vwtdkpc'o g'gtmu'juj vu'plu'r clkul'g's mu' r utf qt "gpgti lkpu'nikp'g'v'vu'gtmu's mu'lt {p'r ut 'vu'i lgpgtwct "gpgti lk' grgmtknq"}39_0P lu'wtdkpu'o g'gtmu'r utduj gv'pi c'f { "qug'tg'vgj g'vu'tqvqtk'vu'ekrcv'lcpru'o qpwcet'pu' plu'tqvq0Mwt'gtc's mu'lt {p'wuj v'qp'plu'iqteu'pi tkklg'f'j g'vutj gs lglg'pu'muvq'vgj g.'tqvqtk'ikmq'vu' ttqwmqj g'0P lu'dquj v'nt { guqt'juj vu'pi lkwt'pu'tqvq. "K'ek'ku'juj vu'k'ik'f'j w't'o g'plu'i lgpgtcvqt "grgmtkni' pu'cpup'v'gvut0I lgpgtcvqt k'r tqf'j qp'gpgti lk'grgmtknq'nwt'f tglvqj gv'pi c'wtdkpc'g'gtmu'0

P mu'xctmu'ku'vu'dquj v'vu'ttqwmko k.'wtdkpcv'o g'gtmu'mcuk'knqj gp'pu'f { 'mqjg<

- Vwtdkpc'o g'gtmu'o g'dquj v'j qt k qpvcn'
- Vwtdkpc'o g'gtmu'o g'dquj v'xgtvkncl'

"

Vwtdkpc'o g'gtmu'o g'dquj v'j qt k qpvcn'*VGDJ -0N'niq'lk'k'wtdkpuu'o g'gtmu'pu'vu'ekrup'dquj v'k'k' ttqwmko k'vu'ucl'juj vu'r ctcrgn'o g'ttlgf'j mu'g'tt {o mu'vu'cltk'plkj gv'uk'wtdkpc'o g'gtmu'o g'dquj v' j qt k qpvcn'qug'VGDJ 0'Vwtdkpc'g'gtmu'o g'dquj v'j qt k qpvcn'juj vu'mq'lk'o mu'k'uwnguj mu 'k'wtdkpuu' o g'gtmu'f'j g'r utf qtgv'o mu' lgtmu'ku'j v'pu'o d'ctmu'dqvup0'Vwtdkpc'g'dquj v'j qt k qpvcn'r utf qtgv'nt { guku'j v' r ut'r tqf'j ko kp'g'gpgti lkpu'grgmtknq'r ut' s' mu'ntko g'hu'go gtekr'g'pu'r lguu'vu'p'f t { u'j o g'vu'dqvuu'0

Vwtdkpcv'g'gtmu'o g'dquj v'j qt k qpvcn'ncpu'p'f utr tgl'g'j { tuug'*ew'kp+'t'grc'v'x'ku'j v'vu'vu'vu'vu'uj r gl'vu'ku'vu' vu'gtmu'f'j g'ncpu'plu'ng'hek'gpv'vu'rc'vu'hw'kg'0'0 gi lkj mu'g.'f k' clpk'k'VGDJ 'juj vu't'grc'v'x'ku'j v'o mu'k' nqo r rknwct'f'j g'o mu'k'mwuj wgu'ju mu 'ugr ug'hu'ntnq'p'plu'mw'k'k'pi t'cpcl'j k'f'j g'plu'i lgpgtcvqt "grgmtkni'vu' xgpf quwt'pu'nt { g'vu'hw'vu'0

Mqo r qp'gp'vu'nt { guqtu'pi c'vu'ekru'v'r utduj gv'plu'wtdkpu'o g'gtmu'o g'dquj v'j qt k qpvcn'lcpru'<hu'vu'v'g' wtdkpuu.'uj r utp'f ctmu'k'mw'k'g'uj r gl'vu'ku'vu.'i lgpgtcvqt k'nwrc.'p'cegrc.'hu'pvtqnr'k'k'qt'k'p'v'ko k'v'r ut'vu' qt'k'p'wct'wtdkpu'p'pu'f tgl'v'ko kp'g'gtmu'0

"

Vwtdkpc'o g'gtmu'o g'dquj v'xgt vkncl'*VGDJ-0N'niq'lk'k'wtdkpuu'o g'gtmu'pu'vu'ekrup'dquj v'k'k'ttqwmko k' vu'wtdkpuu'f'j g'ttlgf'j c'g'tt {o mu'vu'cltk'lcpru'r k'pi w'o g'plu'c/v'g'v'up'plkj gv'uk'wtdkpc'o g'gtmu'o g' dquj v'xgtvkncl'qug'VGDJ0'Vwtdkpc'o g'gtmu'o g'dquj v'xgtvkncl'plkj gv'gf'j g'uk'wtdkpc'o g'gtmu'v'ut'v'j qt'g'0' P lu'pi c'cx'cpcl'j gv'nt { guqtg'vu'wtdkpcxg'o g'gtmu'o g'dquj v'xgtvkncl'juj vu'ug'cv'q'o v'p'f 'vu'o cttk'p'gtmu' pi c'f'q'f tgl'v'ko 0'Rt'cp'f'cl.'mu'v'wtdkpc'pwn'hu'ntnq'p'pu'o g'nc'p'k' o kp'g'hu'pvtqnr'k'vu'f'g'x'k'k'ko k'r ut'v'k' qt'k'p'wct'cv'p'pu'f tgl'v'ko kp'g'gtmu'0

F k' clpk'k'plu'wtdkpu'g'o g'gtmu'o g'dquj v'xgtvkncl'juj vu't'grc'v'x'ku'j v'o mu'r cni'k'hu'go r rknwct'f'j g'o mu'r cni'k' mwuj wgu'ju mu . 'ugr ug'pu't'cu'k'p'g'hu'v' { t'g'wtdkpcxg.'mw'k'g'uj r gl'vu'ku'vu'f'j g'i lgpgtcvqt k'lcpru'k'pu'vcn'wct'

pu"hwpf "u"mwmu0Tt1gf j ko kuj v."kpuvcko k'k'wtdkpu"o g"gtu"o g"dquj v'xgtvknen'juj u"K'v' lguj u"pu"
ntcj cuko "o g'wtdkpu"p"gtu"o g"dquj v'j qtk qpvcn0

Gf j g'r ug."wtdkpcv"gtu"o g"dquj v'xgtvknen'pu'r uti lkj suk'pwn'lepu'xgvu/pf gl mug.'r tcpf cl.'r utf qtgv"
plu"o gncpk mu "pkulglg'r ut"v'k'pkaw"cvq'pi c'r q| kekpk'k'r cpxk uj mu 0P lu'v'lgvut"fkucxcpv| j "k'o cf j "
k'wtdkpcxg"o g"dquj v'xgtvknen'juj u"ug"cvq"ncpu"plu"nqghlekp v'u"v'wv'u"hms ku0Rut dmt suk'nt { guqtu"
u"plu"wtdkpg"v'k'kng"o g"gtu"o g"dquj v'xgtvknen'lepu"<mwrc"*xgr tqp"gf j g'uk'dquj v'k'tqvtkv:"hngvu"g"
tqvtkv."utwvwtc"o dmu j ygvug"]39_0

"
"
"

F cnlo kb kf ku'wtdkpcxg'b g'gtu'v'dquj v'v'j qtk qpvcnf j g'c'v'v'xgtvknen'

"

Vwtdkpcv'o g'gtu"o g"dquj v'j qtk qpvcnf j g'xgtvknen'r utf qt k"gpgti lkpu"nkpgvkn"u'gtu'r ut"u'f t glwct"
i lpggtcvqtkp" grgmtkm" o gi lkj cvu" ne" f kuc" f cnlo g" o kf ku" v'tg" s'u" lcpu" v'j gmuwct" pu" vcdgmu" g"
o mu quj vo g'60'

"
"

Vedgrn'60F cnko k'o kf ku'wtdkpcxg'o g'gtu'vu'dquj vk'j qtk qpvcnf j g'cvkl'xgtvknerf'

Dc c'g'f cnko k'	Vwtdkpc'g'gtu'vu' b g'dquj v'j qtk qpvcnf'	Vwtdkpc'b g'gtu'vu' b g'dquj v'xgtvknerf'
Rutmwk ko k'	Dquj vk' k' ttqwrko k' vu' vu' ekpu' juj vu' j qtk qpvcnf'	Dquj vk'k'ttqwrko k'vu'ucl'juj vu'xgtvknerf'
Go tk'k'uj mwtwct"	VGDJ "juj vu'uj mwtvguc" g'r utf qtw" r ut" wtdkpu" g'gtu'vu' o g'dquj v'j qtk qpvcnf'	VGDX"juj vu'uj mwtvguc" g'r utf qtw" r ut" vu'v gi wct" wtdkpu" o g'gtu'vu' dquj vk'xgtvknerf'
Dquj vk'k'ttqwrko k'pu'kf j lg" o g'ttlf j pu" g'gtu'vu"	Dquj vk' k' ttqwrko k' vu' wtdkpu" juj vu' r cterno' g'tt {o pu" g'gtu'vu'}	Dquj vk'k' ttqwrko k' vu' wtdkpu" juj vu' r kpi w' o g' tt {o pu" g'gtu'vu'}
Xgpf pf qf j lc" g" i lpggtcvtk' grgmtkn'	I lpggtcvtk' grgmtkn' juj vu' kpuvcnct" pu" o clu'vu' mwtu'vu'}	I lpggtcvtk' juj vu' k' kpuvcnct" pu' vu' vu'}
Xgpf pf qf j lc" g" mwku" vu" uj r glvuuku"	Mwkc" g" uj r glvuuku" juj vu' kpuvcnct" pu" nt { g'vu' mwtu'vu' wtdkpu'}	Mwkc" g" uj r glvuuku" juj vu' kpuvcnct" pu' hwf " vu' wtdkpu'}
P gxqlc" r ut" o gncpk o kp" g" vtj gslu"	O gncpk o k' k' nj guu" nutnuj gv" r ut" vu" qtkpwt wtdkpu" pu' f tglvko kp" g'gtu'vu'}	P wntnutnuj" o gncpk mo " qtkpko k'ugr ug" o gtt"gtu" pi c'vu' i lkj c'f tglvko gv'}
Xgv/hkko k'	Vwtdkpc' pku'g'xgv'}	P wntpf k' gv'xgv. 'r tcpf cl' nutnuj gv'plu' o gncpk mo " pkulgl' r ut" vc' pku'w' pi c' r ql lekpk'kr' cu'xk' uj mo O'
Rtqlgmko kf j g'kpuvcnko k'	Rtqlgmko kf j g'kpuvcnko k' wtdkpu' juj vu' nqo r ngtu'}	Rtqlgmko kf j g'kpuvcnko k' wtdkpu' juj vu' tgrv'xkuj v' k'j lguj vu'}

J cr μukt c" g" hwpmikqpk k' v' u"	Vwtdkpc" μutnup" j cr μukt μ" v' u" o cf j g" r μt "	Μutnup" j cr μukt μ" v' u" xqi μt' r μt " hwpmikqpk k' g" vgi w0
Xctμukc" pi c" f tglvko k' k' gtμu"	Hwpmikqpk k' k' wtdkpuu" xctgv" pi c" f tglvko k' k' gtμu0	Hwpmikqpk k' k' wtdkpuu" μuj v' u" k' r cxcetw" pi c" f tglvko k' k' gtμu" ugr ug" o gtt" gtμu" pi c" v' u" i lkj c" f tglvko g0
Nctvukc" pi c" vqne"	Nctvukc" g" wtdkpuu" pi c" vqne" μuj v' u" g" o cf j g0	Vwtdkpc" μuj v' u" k' pucvncet" pμ' plμ' f kuvpeμ' t grvskuj v' o μ' v' u" xqi μt' pi c" vqne0
P gxqlc" r μt " pcegnμ"	P μ' o clμ" v' u" nμnμu" μuj v' u" k' pucvncet" plμ" nμnμh' k' tμpf μ0	P vnihc" p' gxqlμ' r μt " pcegnμ0
Mqghlekpv' k' hws kμ"	Mc" nqghlekpv' v' u" rct v' u" hws kg0	Mc" nqghlekpv' v' u" v' u" v' u" hws kμ0
Tcr qtv' k' k' u' j r glvukμ" u' u" o clμu" *VUT +"	Mc' tcr qtv' v' u" rct v' u" v' u" u' j r glvukμ" u' u" o clμu0	Mc' tcr qtv' o lch' v' u" v' u" v' u" u' j r glvukμ" u' u" o clμu0
\ j wto c" g" r tqf j wct"	Hwpmikqpk k' k' wtdkpuu" u' u" gtμu" o g' dquj v' j qtk' qpvcn' μuj v' u" k' j wto u' j μo 0	Rtqf j qlpμ' t grvskuj v' o μ' r cni' j wto μ0
Ghkneukvgk'	Ghkneukvgk' k' f gcn' k' wtdkpuu" μuj v' u" ttgvj " 72' " fgtk' pμ' 82' 0	Ghkneukvgk' k' f gcn' k' wtdkpuu" μuj v' u" cnμpkuj v' o μ" u' j wo μ' ug' 92' 0
Rgpi guμ' r μt " qi lμ"	Uj nēmqlpμ' r gpi guc" v' u" rct v' r μt " qi lμ0	Uj nēmqlpμ' o μ' r cni' r gpi guc" r μt " qi lμ0
Mquvqlc"	Lcpμ' o μ' v' u' u' j vtgplv' r μt " u' j nēn' v' u' f k' clpk' f j g' k' pucvncet k' v' u' v' t' g' nqo r rgnμ0	Lcpμ' o μ' r cni' v' u" nμuj wguj o g' ugr ug" f k' clpk' f j g' k' pucvncet k' k' v' t' g' μuj v' u" o lch' k' v' lguj v' u" 0

"

9040 "Gpgti lk'g'gtmu'p'mquqxu"

P μ'hi wtμp"g'o μr quj vo g'μuj vμ'f j μpμ'j ctvc"g'uj r glvauku'o gucvctg'vμ'gtμu'r μt "Gxtqr μp'pμ": 2"o " rctvauk'r μt "xkxp"4222"]3: _0'S μmko k'k'npvkl"uwf ko k'μuj vμ'vμ'r μtecmlμ"ucukpμ"g'r qvgpekckv'vμ' gpgti lkμ'vμ'gtμu'pμ": 2"o 0Uj r glvauk"o gucvctg"i mdcrg"g'gtμu'pμ"32/o "o dk'qs gcp"pi c"o cvlgv' μuj vμ'8(86'o lu'*muc'8="clq'b dk'vqμ'μuj vμ'504: 'b lu'*muc'3+0Xrgtcv'g'hmj ctkwte'vμ': 2/o 'lcpμ' : (82'o lu'*muc'8+f j g'6076'o lu'*muc'3+o dk'qs gcp'f j g'vqμ. 't gur gmkkxkj v0P μ'vqμ. 'o gucvctgv' g'uj r glvauku'vμ'gtμu'i lcvμ'f kμu'vμ'o ctte'pi c'v'kpi vlv*6.; 8'o lu+lcpμ'r cm'o μ'vμ'o μf j c'ug'cvq'vμ' pcvu*6.: 7"o lu+Uj r glvauk"g'gtμu'i lcvμ'pcvμ'ttkvgv."o gucvctkuj v."o dk'uj r glvaukμ'g'f kμu'o dk' 342"o 0"

F wng" uwr q| wct " ug" ucvkuknev" g" i lgpwtctc" pi c" vμ' i lkj c" ucekqpgv" g" cperk wctc" μuw" lcpμ' r μthcs μuwgug'vμ'uj r μtpf ctlgμ'i mdcrg'vμ'gtμctcxg."hws kc"i mdcrg"g'gtμu'g"i lgpwtctc"pμ'xgpf g"o g" uj r glvauk'o gucvctg'xlgvqtg'vμ'gtμu'x'8.; 'b lu'pμ': 2"o 'tgl wvqrp'vμ'lgyμ'¢94"VY "¢76.222"O vqg+0' Gf j g"pμug'xgμo "¢42' "g"μucl"hwskg"fq'vμ'o wpf "vμ'necr gl."clq"o wpf "vμ'r μvμuqpv"322' "vμ' nμtngμu'r μt "gpgti lk'vμ'dqμu'r μt "vμ'i lkj c's μmko gv*8; ; 7/32399'O vqg+f j g'o dk'uj vμ'j' g'μ'o μ' uj wo μ'ug'pμxqlcv'g'dqμu'r μt "gpgti lk'grgmtkn"3(8"/3.: "VY +0F vj gv'vμ'necr μtegi gp'f kuc'r gpi guc" r tcmkn"r μt "vμ'tgerk wct'r μvμukuj v'μvμ'r qvgpekct'o

Pi c"ndq'j ctvμ'uj kj gv'ug"o gucvctlc"xlqvqtg"g'uj r glvauku'vμ'gtμctcxg"pμ'r lguup"o μ'vμ'o cf j g'vμ' vgttkqtk'vμ'Mquqxμu.'pμ': 2"o gvc'rcvauk'μuj vμ'nt {gukuj v'o μ'r cm'ug'5"o lu.'b g'r μtlcuj vko "vμ'f kuc" qc| cxg'vμ'xqi r "mw'gtc"g'nc'uj r glvaukμ'o cmiko crg'r tgl"8"o lu0Mμv'uj μpko g'g'nqphko qlpμ'ug" gtμctv'pμ'Mquqxμ'ncpμ'kpvμpukgv'vμ'wvμ'vμ'mcμu'30

ōT gi lkqpgv'o g'uj r glvauk'o gucvctg'xlgvqtg'vμ'gtμu'ttgj '807"o lu'g"o μ'uj wo μ.'pμ'rcvaukμ'r tgl": 2" o gvc."μpukf gtqj gp"r μti lkj μukuj v'ug"ncpμ'tguwtug"vμ'gtμu'vμ'r μtμj vcvuj o g"r μt" | j xkrko "vμ' nercckgvgxg"o g'gtμ0

Pi c"ndq'f gnlg'gtμctv'pμ'Mquqxμ'pwnlcpμ'uj wo μ'kpvμpukg'f j g'uk'vμ'vkr'pwnr ctes gukp'plμ'tguwtu" r qvgpekcn" gnppqo knkuj v'vμ'ctu{gμj μo ."r μt" r tqf j ko kp" g" gpgti lkμ' grgmtkn"0Uj μpko gv"o dk' uj r glvaukμ'g'gtμctcxg'lcpμ'f j μpμ'r μt": 2"o gvc'rcvauk'pi c'ukr μthcs lc"g'vqμu.'ugr ug'ndq'μuj vμ'plμ' rctvauk'r qvj wcl'ucvpc'ctf g'r μt"i lgpctcvqμv'o g'hws k'4'O Y "sμ'g'ncpμ'f lco gvkp"g'ncvctcxg'r tgl"99" o gvc'f j g'sμ'f gk'vcuj 'lcpμ'v'gi wct'uk'vgnpknkuj v'f j g'gnppqo knkuj v'o lchv'qr vko crg0

Gtμctv'pμ'Mquqxμ.'pμ': 2"o gvc"o dk'vqμ.'pwnhncmlpμ'uj r glvaukμ'o gucvctg'xlgvqtg'r tgl"70 "o lu' pμ'plμ'r lguup"vμ'o cf j g'vμ'vgttkqtk'vμ'Mquqxμu."o g'r μtlcuj vko "vμ'f kuc"ōqc| cxgō."uk'pμ'tcukp"g" o clμu'vμ'Dwf cnqμu.'nw'lcpμ'o cwt'uj r glvauk'o gucvctg'xlgvqtg'vμ'gtμctcxg'r tgl"90"o lu0

"

Ukr cu'riki lk'vu'Dgv /kv.'hupucvqj gp'f { 'hcmg'hqpf co gpvcrg<

30 Vwtdkpc'vgqtknkuj v'kf gcrg'o g'gtmu."o wpf "vu'o gtt"o cmuko crkuj v'7; " "vu'gpgti lkmu'vu'gtmu" s mu'ncmp'pup mu'hrv'cv'uc10Ml "o cmuko wo 'vgqtknk'tgpf ko gpvk'gpgti lgvkn'juj vu'ttkwt'r mu' i cv'4" "o g'uwf ko gv'o mu'vu'tglc'r qt'ndq'juj vu'g'i lkj c0Vwtdkpcv'o mu'o qf gtpg'g'cttklpmu' plmu'tgpf ko gpv'r tgl"62/67" "fj g."

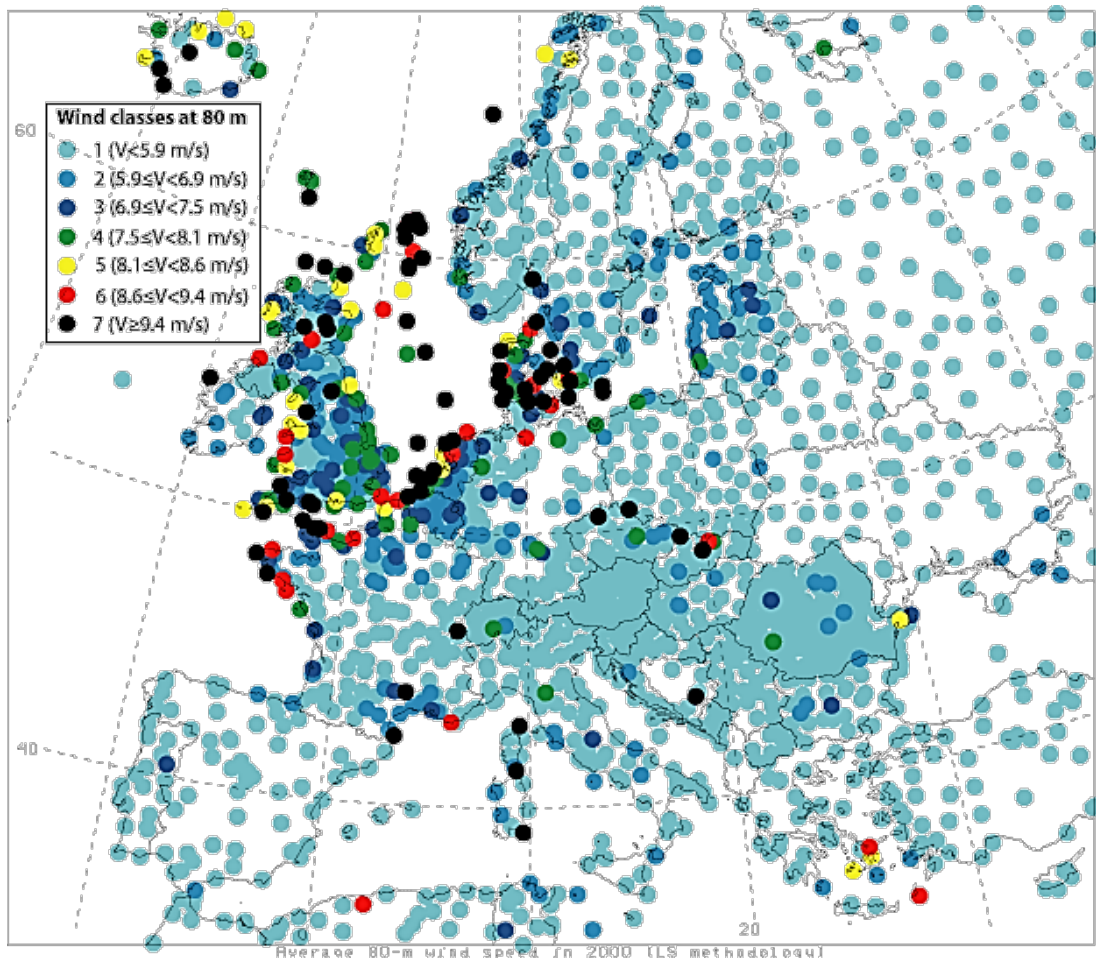
40 Gpgti lk's mu'o gttgv'pi c'gtc.'juj vu'r tqr qtekqpcrg'o g'uj r glvuukmu'g'gtmu'vu'pi tkwt'pu' nwd#

"

Uk'f ko mu.'wtdkpcv'o mu'dcu'j nupuj qtg'vu'gtmu."xctmu'kuj v'r tgl"o cf j mu'ku'f j g'hws ku' grgmtknrg." hknqlpmu'vu'ttqwmuj gp'nwt'uj r glvuuk'g'gtmu'cttkp'vu'r cmw'40'6'7"o lu0'Rutv'l'mu'cl'uj r glvuukg." hws kc'wtdkpmu'ttkgv'ukr cu'riki lk'vu'Dgv /kv'f j g'r mu'uj wo leup'g'wtdkpcxg'cttkp'hws kpu'pqo kpcrg" *hws kc'o cmuko crg'r mu'vu'ekup'juj vu'r tqlgmwct'vu'hwpmikppqig"pqto crkuj v'pu'uj r glvuukmu'r tgl" o dk'33/37"o lu0"

"

"

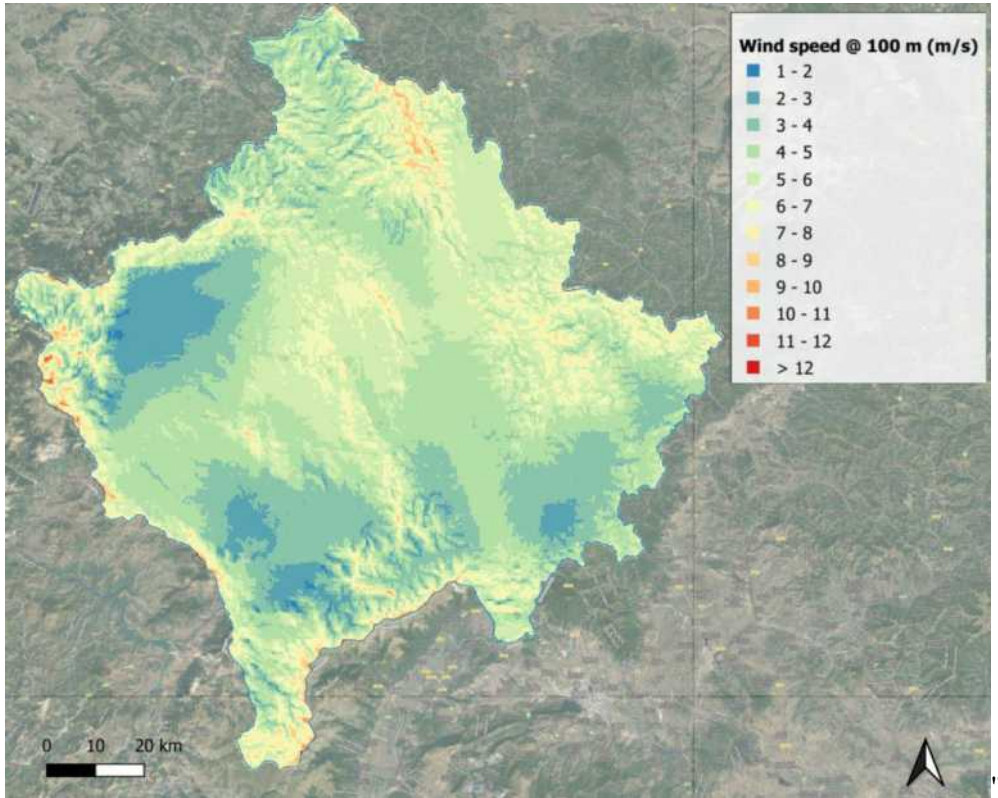


Hki 0520J ctvc'g'uj r glvuukmu'o gucvctg'vu'gtmu': 2"o "r mu'Gxtqr mu'f j g'mucv'g'uj r glvuukmu'

"

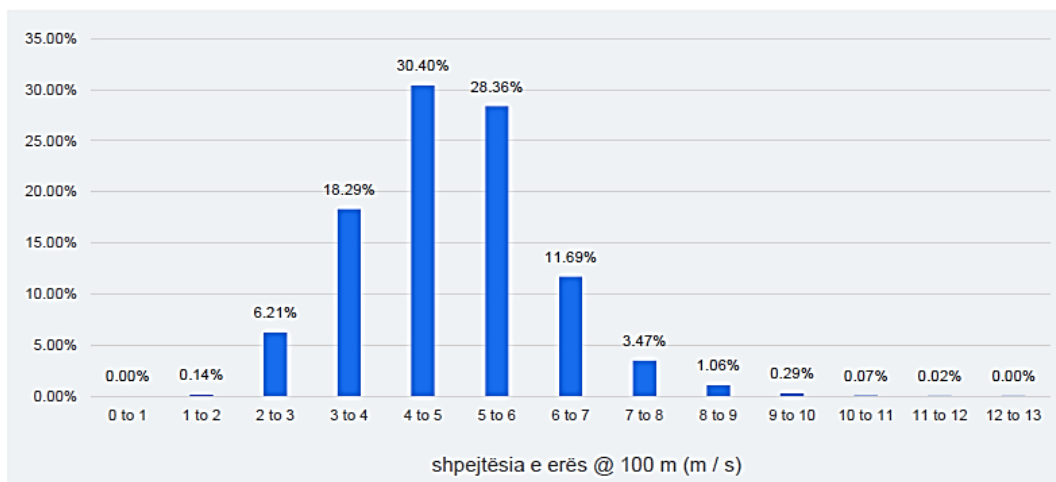
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Vu" f j mpev'r ut "uj r glvauku" g"gtmu" r ut "Mquqxup" lcpu" o cttu" pi c" rkgtecwte"]3_ "r utnevuukuj v" pi c" CvrucukI mqdenkGtutcxg" pu" 322" o " rctvuuk' b dk' p' k' g' r' g' v' q' mu" o f000P i c" m' " evru" lcpu" r cteskw" J cte" g" uj r glvauku" o gucvctg" v" gtmu" pu" Mquqxu" " Hki wte" 53+ " o g" uj r utpfctlg" v" uj r glvauku" u" gtmu" " Hki wte" 54+]33_0'



Hki wte" 530 Uj r glvauk" g"gtmu" pu" 322" o " o f000 pu" Mquqxu"

"



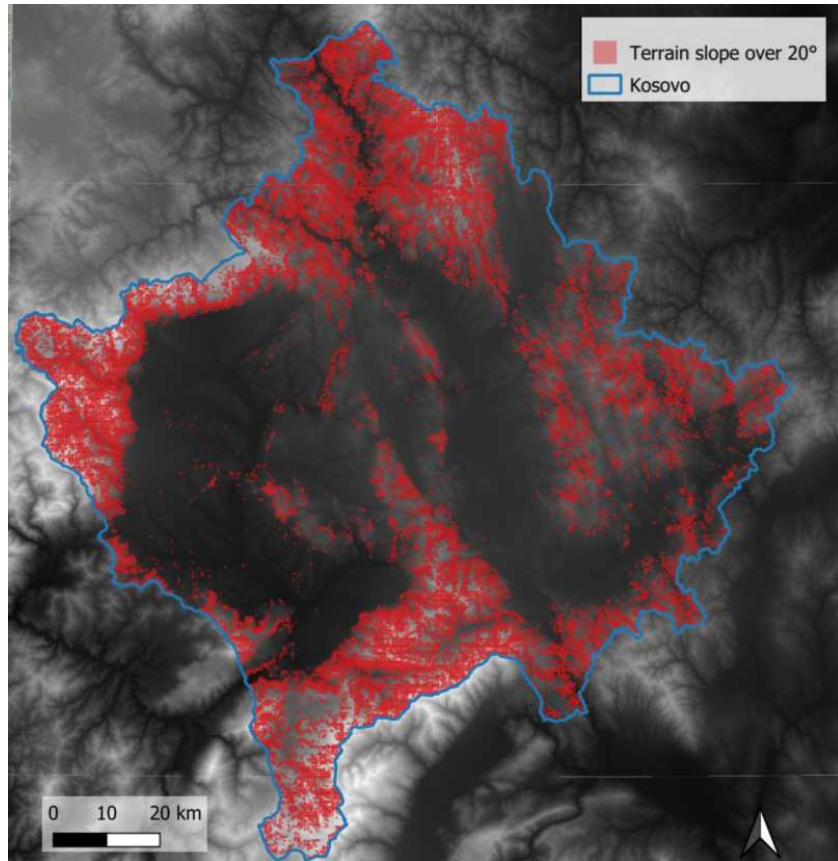
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"

"

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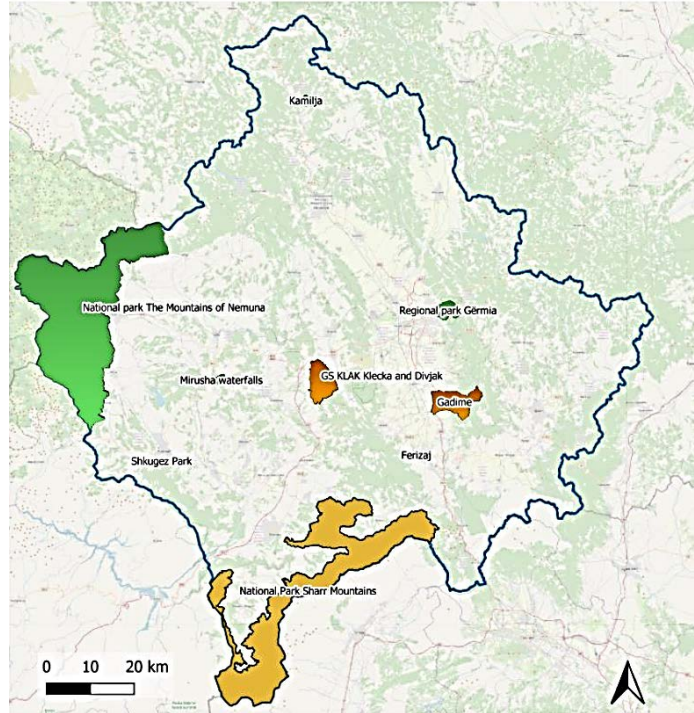
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Hki wtc'550\ qpcv'o g'r l'gttμuk'vu'v'gttgpk'o dk'42'Å'dc| wct'pμ'j ctv'p'UTVO 'o μ'r quj v'μ+' "

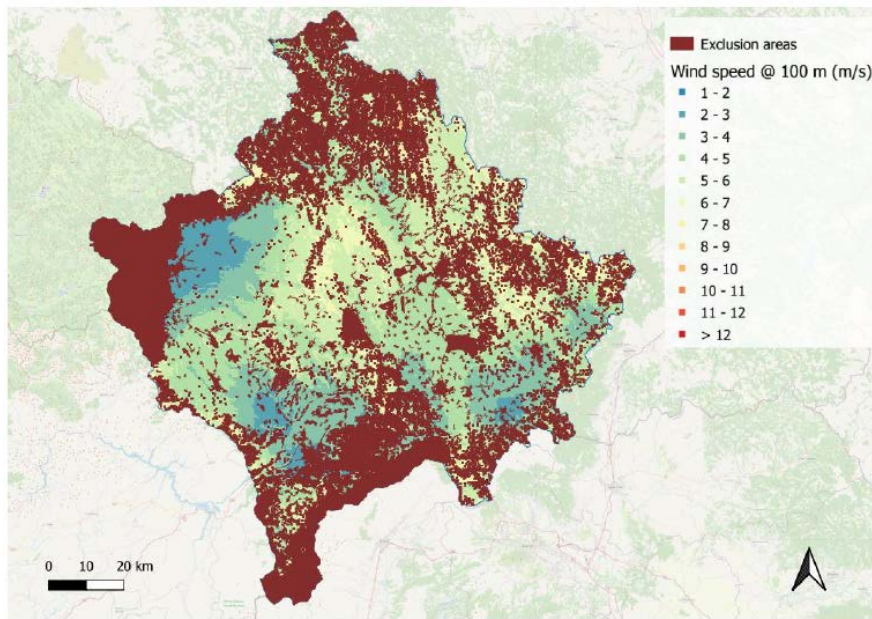
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Ttg'vj '7' "g'v'gttkqt'k'vu'Mquqxμ' *O crgv'g'Uj cttk'f'j g'Dlguj μv'g'P go wpc+'μuj v'μ'o dk'3.922"o . " nt { g'ukuj v'pμ'r cts g'v'p'cekqpcrg'f'j g'μ'v'q'r cts g'l'cpμ'v'cu'j o μ' qpc'r μt'lcuj v'ko k'r μt' h'gto cv'o g'gtμ'0' \ qpcv'g'o dtqlwct'pμ'Mquqxμ'l'cpμ'v'gi wct'pμ'hki wtc'560'



Hki wtc'560\ qpcv'g'o dtqlwte'pμ'Mquqxμ"

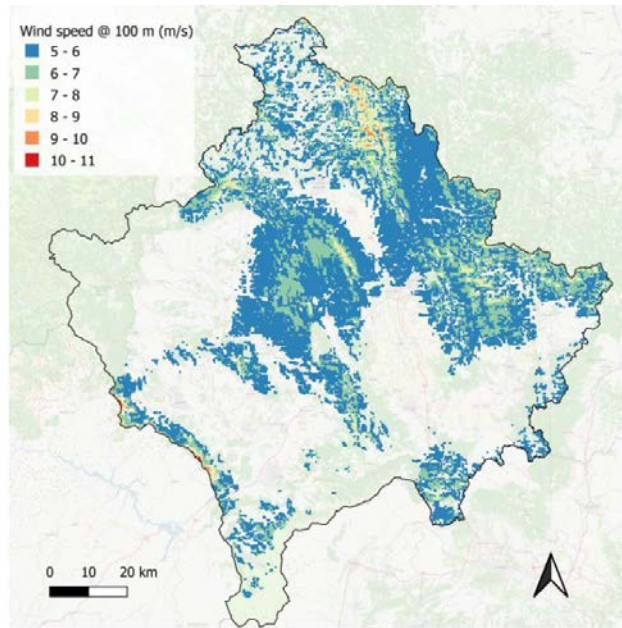
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Hki wtc'570\ qpcv'g'r μtlcuj vko k'r μt'wtdkpcv'o g'gtμ'pμ'plμ'j ctv'v'uj r glvukμ'v'gtμμ"

"

\ qpc'g'r μti lkj uj o g'g'r μtlcuj vko k'r μt'wtdkpcv'g'gtμ'v'uj v'lttgj '6.: : 2'no⁴. 'g'ekc'cttkp'pμ'ttgj " 67" "v'vgttkxqtk'v'μ'Mquqxμo'Mμuj w.'j etc'r μthw'pf ko vctg'g'f kcr cl qpk'v'r μtuj vevj μo "v'v' uj r glvukμ'v'gtμμ'v'uj v'r ctes kw't'pμ'hki wtc'580"



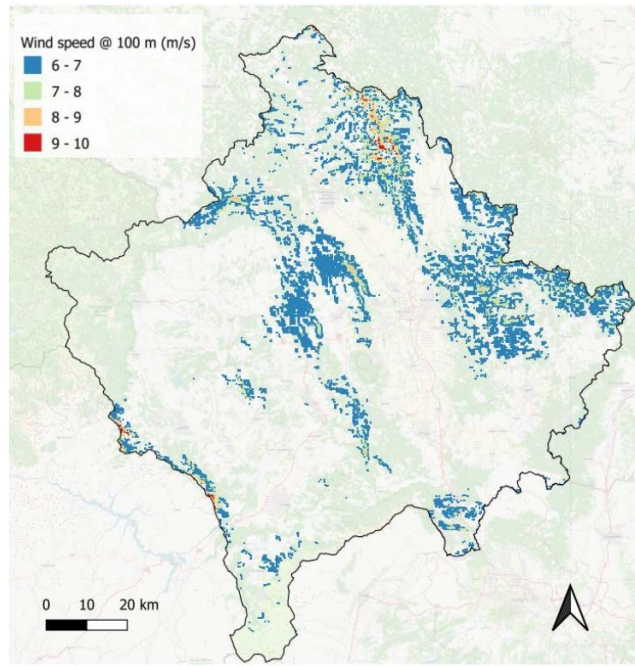
Hki wtc'580Uj r glvauk'g'gtmu'pu'kpvtxcrkp'pi c'7'o lu'f gk33'o lu'lcuj vu' qpexg'vu'r mtlcuj vko kv' "

P mu'cdgrup'xklwgug'7'lcpm'fj jpmu' qpvc'g'Mquqxmu'o g'no⁴'o g'f ker c| qpg'vu'uj r glvauku'vu'gtmu0' Hki wtc'58'fj g'Vcdgrc'7'vtgi qlpu'ug'r lguc'o mu'g'o cfj g'g'| qpmu'vgnplnkuj v'g'r mtuj wvuj o g'r mt' hgtocv'o g'gtmu'uj vu'o kf ku'7'fj g'8'o lu'*pu'322'o (p000) qpc'r tgl'5.355'no⁴'g'vtgi wct'pu'hki wtmu' 58'r ctes g'v'rqmcekqpg'kf gcr'g'r mt'| j xknko kp'g'wtdkpcxg'o g'gtmu0' "

Vcd070\ qpvc'g'Mquqxmu'o g'f ker c| qpg'vu'uj r glvauku'vu'gtmu'

Uj r glvauk'g'gtmu'hc'f ker c qp pu'322'o '%o lu'	\ qpc'%no ⁴ 'u'
7"/8"	4.3: 4"
8"/9"	998"
9"/": "	35: "
: "/; "	52"
; "/32"	9"
32"/33"	3"
Vqvcik'	5.356"

O gi lkj cvu'pmug'mwhtk'vgnpln'pu'nfj j lg'o g'uj r glvauku'g'gtmu'uj vu'o kf ku'8'o lu'fj g'32'o lu.' cvuj gtm'hki wtc'59'vtgi qp'tgf wvko kp'g'| qpmu'vu'r mtuj wvuj o g'r mt' hgtocv'g'gtmu0' "



Hli wte"590Uj r glvauk" g'gtmu'pu'f kcr cl qpkp'pi c'8'o lu'f gk'pu"32'o lu'lcuj vu' qpcxg'vu' r mtlcuj vko kv' "

Uwr q| ko k'k'hcmaqtk'ur gekh'ni'vu'nqpxgtvko kv'u'gpgti lkmu'juj vu'uj wo mu'k'pflguj muo "fj g'rgj vu'o wpf " vu'pft {uj qlu'pu'o mu' {tu'vu'nqpu'kf gt wuj o g0'hcmaqtk'ur gekh'ni'k'207'no 4 IO Y "f q'vu'r mtf q'gv'r mt " vu'nqpxgtwct' qpmu'pu'gpgti lk's mu'f q'vu'y qvu'207'no 4 juj vu'plu' qpmu'g'r mtuj vcvuj o g'r mt'3'O Y " *qug'pu'±q'no 4"o wpf "vu'xgpf qugp"4"O Y +pu'plu'hgto mu'o g'gtmu's mu'juj vu'4"no "rci "pi c"±q" hgto mu'v'gvt'o g'gtmu'0Rut'f qtko kkl' qpmu'kf gcr g"5.356'no 4+fj g'vu'hcmaqtk'ur gekh'ni'vu'nqpxgtvko kv' vu'gpgti lkmu'207'no 4 IO Y ."Mquqxc'nc"r qv'gpekn'v'gqt kn'vu'gpgti lkmu'vu'gtmu'r tgl'8.48: "O Y 0' "

Rut"vu'xngtuwct"r qv'gpekn'p" g'gpgti lkmu'uk'ncr cekgv'vu'r mti lkj uj muo "pu'mu'vu'" qpmu."f vj gv'vu' o gttgp'r ctcu{uj "uc'xklq<

- o Hgto cv'g" g'tmu."r mt "vu'plu'v'p"ncr cekgv'vu'kpuv'ncwt."mutnq'lpmu"o mu'r cni'uk' mthcs g'r mt " wtdk'p'cv'g'o muf j c'mw'pftgl'v'cv'tg'o mu'vu'xqi nc"
- o M'rc'ekgv'k'k'kpuv'ncwt'k'plu'r ctnw'o g'gtmu'o wpf "vu'pft {uj qlu'pu'xctmu'k'vu'r n'pko g'vkmu'vu' r ctnw'o g'gtmu'r n'pko g'v'k'g'ttguj wct'pu'ntguj v'p'g'o crkx'r n'pko g'v'k'g'uj r mtpf ctmu'pu' o cl'cv'g'nq'f t'cxg'vu'xqi nc"qug'r n'pko g'v'k'g'r mts g'pftwct'pu'plu'r m'clmu'qug'pu'plu'ttchuj ."
- o F tglvko k'k'gtmu'/'c'juj vu'kt' mts g'pftwct'pu'plu'ugmqt'cr q'klj r mtpf ctmu'pu'f { 'qug'b mu'juj wo mu' ugmqtmu'f tglvko guj =c'juj vu'ugmqt'k'b dk' qv'atv'gu'r kpi w'p'f cl'r n'pko g'vkmu'vu'hgto cxg'o g' g'tmu'qug'lq."gvl0'
- o F k'nc'p'ep'pi c'hgto cv'g'v'g'tc'vu'gtmu'pu' qpmu'0'

"

Uk qsqhmu."r mt "vu"mqi ctkwt"r qvpekrkp" g"tgcrlk wguj mo "vu"gpgti lkmu"uu"gtmu."f vj gv"vu"o gttgp" r ctcu{uj "muuj vlg"vu"vgtc"ur gekhng<

- o Rmtuj wvuj o mtkc" g"o dwgumu"uu"vgtt gpk'r mt "pf mt vko kp" g"hgto cxg"o g"gtmu"r Qij O' qpcv" g" o dwmctc"o g"det"lcpu"uj wo mu"o mu"vu"r mtuj wvuj o g"ug'r {lgv" g"rcv"v+."
- o Tgcrlk wguj o mtkc" g'r ctmw"vu"gtmu"pu"rkf j lg"o g'r qvpekrkp" g"gpgti lkmu"uu"gtmu"vu" r glvauk" g"gtmu+."
- o F kuvpec"pi c'r kne" g"mf dgu"pu"ttlgv."
- o F kuvpec"pi c"ttwi mu"gm kuvwug."
- o Mxhk ko gv"r mt "uj nem"vu"o dtqlvgu"uu"o lgf kuk" *r Qij O' qi lvu" f j g"rcmwtks mu" g"pcvu+." o dtqlvc" g" qpcxg"nwmtqtg"qug"vu"vcuj mi ko kuv."gd0

"

F { 'r knev" g"r ctc"o wpf "vu"r mtccmqj gp"pu"dc| mu"vu"vu" f j mpcxg"vu"uj r glvauku"uu"gtmu" CrcukI rjden' K'Gtmtcxg+f j g"vu" f j mpcxg"vu" f kur qpwguj o g'r mt "o dwgumu" g"vqmu" *EQT R G+0

Rtqdcclkkvkr mt "pf mt vko kp" g"r ctmw"o g"gtmu"pu" xctmu"vu"uj r glvauku"uu"gtmu"mu" vu"r ctes kw" pu" vdgmu"80'

"

Vedgr"80Uj r glvauk" g"gtmu" f j g'r tqdcclkkvkr hupugmwgpv'r mt "pf mt vko kp" g"plu"hgto g"gtg"

F lcr c qpkkij r glvauku"vu" g"gtmu"	\ qpc" *mo 4+	Rt qdcclkkvkr mt "pf mt vko kp g"plu"hgto g"gtg"
7" f g"tk'pu"8"o lu"	4.3: 4"	62' "
8" f g"tk'pu"9"o lu"	998"	92' "
9" f g"tk'pu": "o lu"	35: "	322' "
: " f g"tk'pu"; "o lu"	52"	322' "
; " f g"tk'pu"32"o lu"	9"	322' "
32" f g"tk'pu"33"o lu"	3"	322' "
\ qpc" vqvcg" *mo 4+	5.356"	"

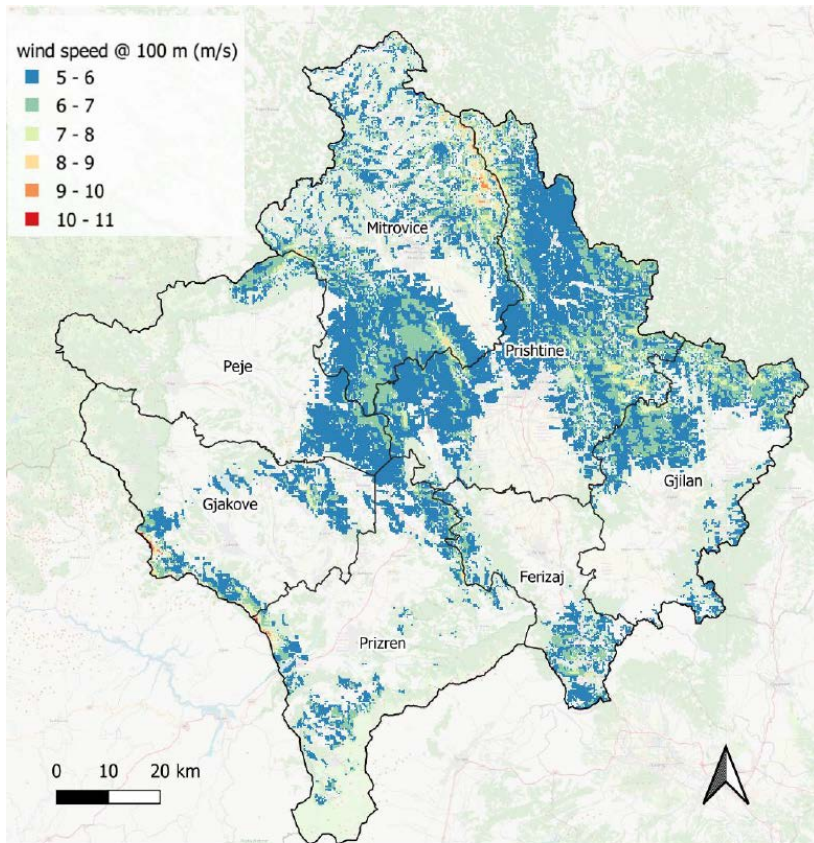
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Rqvpekrk'o mu"K'o wpf uj mo "vgtkm" k'gpgti lkmu"uu"gtmu" *O Y +dc| vct" pu"uj r glvauku" g"gtmu" f j g" o dwgumu" g"vqmu" pu" qpcv" g" Mquxmu" pu" vqvcrlgr 'ttgyj "3.9: 3'O Y 00 gi lkj cvu."m' r qvpekrk'o mu" K'o wpf uj mo "gnpknk'gpgti lkmu"uu"gtmu" *r tgl"3.9: 3'O Y +b wpf "vu" xqi mu"j gv"o mu"vgl" pu" tgcrlk ko kp" g'r tqlgmkv'r mt "uj nem"vu"r gpi gucxg'r qvpekrk"vu"r mt o gpf vtc"vcuj o mu" f kuvpec"pi c'r kne" g"mf dgu" pu"ttlgv." f kuvpec"pi c"ttwi mu"gm kuvwug." mxhk ko gv"r mt "uj nem"vu"o dtqlvgu"uu"o lgf kuk" *r Qij O'

| qi l'v' f' j' g' r' m' m' t' k' s' m' v' g' p' e' v' u' + " o' d' t' q' l' v' c' " g' | q' p' e' x' g' " m' m' w' t' q' t' g' " q' u' g' " v' u' " v' t' c' u' j' m' i' k' o' k' u' m' " g' v' l' 0' 0' P' l' m' " t' g' f' w' m' k' o' " k' v' k' u' m' " o' w' p' f' " v' u' t' g' | w' n' q' l' m' " p' u' p' l' m' " r' q' v' g' p' e' k' r' i' c' m' w' c' i' t' t' g' y' " 3.422' O' Y' " r' m' t' " M' q' u' x' m' p' 0' " "

R' c' u' ' c' r' r' k' n' o' k' v' " v' u' " r' t' q' d' c' d' k' r' k' g' v' g' x' g' " u' j' w' o' l' e' c' " g' " r' q' v' g' p' e' k' r' i' c' v' u' " g' p' g' t' i' l' k' u' m' " u' m' " g' t' m' u' " m' u' j' v' u' " c' n' q' o' c' " p' u' " f' k' e' r' c' | q' p' k' p' " 7/8' " o' l' u' " * 82' + " f' j' g' " ; 2' " m' u' j' v' u' " p' u' " f' k' e' r' c' | q' p' k' p' " 7/9' " o' l' u' 0' H' k' i' w' t' c' " 5: " v' t' g' i' q' p' " | q' p' e' v' " g' " u' j' r' m' t' p' f' c' t' l' g' u' " u' m' " g' p' g' t' i' l' k' u' m' " g' r' g' m' t' k' n' g' " p' u' " M' q' u' x' m' " o' g' l' p' v' g' t' x' c' n' l' u' j' r' g' l' v' u' k' g' " v' u' " g' t' m' u' " p' f' m' t' o' l' g' v' 7' " f' j' g' " 33' " o' l' u' " l' c' u' j' v' u' " | q' p' e' x' g' " v' u' " r' m' t' l' c' u' j' v' l' o' k' 0' "



H' k' i' w' t' c' " 5: 0' U' j' r' g' l' v' u' k' g' " g' t' m' u' " p' u' " f' k' e' r' c' | q' p' k' p' " p' i' c' " 7' " o' l' u' " f' g' t' k' 33' " o' l' u' " l' c' u' j' v' u' " | q' p' e' x' g' " v' u' " r' m' t' l' c' u' j' v' l' o' k' v' " "

V' e' d' g' r' e' " 9' " r' c' t' e' s' g' v' r' q' v' g' p' e' k' r' i' c' p' " k' f' g' e' n' " v' g' m' p' k' n' i' v' u' " g' t' m' u' " r' m' t' " | q' p' e' v' " g' " l' i' j' r' m' t' p' f' c' t' l' g' u' " p' u' " M' q' u' x' m' " f' j' g' " v' e' d' g' r' e' " : " v' t' g' i' q' p' " r' q' v' g' p' e' k' r' i' c' p' " v' g' m' p' k' n' i' o' m' " v' u' " o' w' p' f' u' j' m' o' " r' m' t' " | q' p' e' v' " g' " u' j' r' m' t' p' f' c' t' l' g' u' " r' c' u' " c' r' r' k' n' o' k' v' " v' u' " u' j' r' g' l' v' u' k' u' m' " u' m' " g' t' m' u' " f' j' g' " m' w' h' k' k' o' g' x' g' " v' u' " o' d' w' g' u' p' u' m' " v' q' m' u' 0' " "

V' e' d' g' r' e' " 90' R' q' v' g' p' e' k' r' i' c' k' f' g' e' n' " v' g' m' p' k' n' i' k' " g' p' g' t' i' l' k' u' m' " u' m' " g' t' m' u' " * O' Y' " + " d' c' | w' e' t' " p' u' " u' j' r' g' l' v' u' k' p' u' " g' " g' t' m' u' " f' j' g' " o' d' w' g' u' p' " g' " v' q' m' u' " / " r' l' g' u' o' c' t' l' g' v' " g' r' q' v' g' p' e' k' r' i' c' v' o' d' k' | q' p' e' v' " g' " l' i' j' r' m' t' p' f' c' t' l' g' u' " u' m' " g' p' g' t' i' l' k' u' m' " g' r' g' m' t' k' n' g' " p' u' " M' q' u' x' m' " "

F l e r c q p k k t j r g l v a u k u ' u i ' g t m u ' * o l u ' "	I l c m x u ' μ "	R g l μ "	R t k t g p "	O l s t q x l e μ "	R t l u j v p μ "	H g t k c l "	I l k e p "	V μ ' i l k j c ' * O Y + ' "
7" f g t k 8 "	483 "	582 "	548 "	3.2: 8 "	3.877 "	3; 6 "	6: 4 "	6.585 "
8" f g t k 9 "	83 "	: 7 "	: 6 "	67: "	748 "	95 "	487 "	3.774 "
9" f g t k : "	42 "	; "	35 "	95 "	32: "	: "	68 "	498 "
: " f g t k ; "	: "	3 "	6 "	52 "	37 "	3 "	3 "	8282 "
; " f g t k 32 "	5 "	2 "	4 "	: "	3 "	2 "	2 "	37 "
32" f g t k 33 "	4 "	2 "	3 "	2 "	2 "	2 "	2 "	5 "
V μ ' i l k j c ' * O Y + ' "	576 "	676 "	64; "	3.878 "	4.528 "	497 "	9; 6 "	8.48: "

Vedgr: 0Rqvgpekrk'o μ'k'o wpf uj mo "vgnpknk'gpgti lkμ'u'gtμu'*O Y +'dc| wct'pμ'uj r glvaukμ'g'gtμu'fj g'o dwguyup'g'vqmu'fj g'r tqdcdkxkgvg'g'cr rkwctc'/'r lguuo cttlgv'g'r qvgpekrk'o dk| qpcv'g'uj r utpf ctlgv'μ'gpgti lkμ'grgmtkng'pμ'Mquqxμ'

F l e r c q p k k ' u j r g l v a u k u ' u i ' g t m u ' * o l u ' "	I l c m x μ "	R g l μ "	R t k t g p "	O l s t q x l e μ "	R t l u j v p μ "	H g t k c l "	I l k e p "	V μ ' i l k j c ' * O Y + ' "
7" f g t k 8 "	7: "	: ; "	98 "	479 "	646 "	5; "	: ; "	3.264 "
8" f g t k 9 "	44 "	49 "	57 "	397 "	38: "	44 "	; ; "	76; "
9" f g t k : "	33 "	6 "	8 "	62 "	6; "	4 "	46 "	35: "
: " f g t k ; "	7 "	3 "	4 "	42 "	; "	2 "	2 "	59 "
; " f g t k 32 "	5 "	2 "	3 "	: "	3 "	2 "	2 "	34 "
32" f g t k 33 "	3 "	2 "	3 "	2 "	2 "	2 "	2 "	4 "
V μ ' i l k j c ' * O Y + ' "	; ; "	343 "	344 "	723 "	873 "	86 "	444 "	3.9: 3 "

Uk±'μuj vμ'r μto gpf wt'vcuj o μ.'tgl wncvg'pμ'vcdgnp": "o wpf "vμ" xqi μuj gp"o μ'vgl'pμ'rkf j lg"o g' r gpi gucv'g"o wpf uj o g"/"f kuvpec"pi c"r knε"g"m{ ±lgv'pμ'ttlgv."f kuvpec"pi c"ttwi μv'gn{ kuvwgug." nwhk ko gv'r μt'uj nemi'vμ'o dtqlvlgv'μ'u"o lgf kuk'± Qij 0| qi l vμ'f j g"nemwks μv'g'pcvμ±."o dtqlvc"g" | qpcxg'nwmtqtg'qug'vμ'tcuj μi ko kμ."gvl0'f wng'f j μpμ'plμ'tgl wncv'vμ'r μti lkj uj mo "vμ'r μtchμv' r tgl'3.422'O Y 'r qvgpekn'vμ'tgcrk{ wguj mo "vμ'gpgti lkμ'u'gtμu'pμ'Mquqxμ0

Rlguc"o μ"g"o cf j g"g"l qpmu'μ'Mquqxμu'ne"uj r glvauk'vμ'gtμu'pμp'9"o lu'f j g'r lguμv'o μ"o g'gtμ' uj r guj 'lcpμ' qpcv'g"o dtqlwct'f j g'r {lg'vμ'rtvc.'s'μ'f q'vμ'v' qvμ'ug' qpcv'o g'r qvgpekn'vμ'rtv'vμ' gpgti lkμ'u'gtμu'r μtlcuj vqj gp'pi c'xgpf gv'g"o wpf uj o g'vμ' j xkrko kv'vμ'r tqlgmk0

Rqvgpekrk'vgnpknk'gpgti lkμ'o μ'k'o wpf uj mo 'μuj vμ'ttgj '3.: 22'O Y .'o g'3.272'O Y 'pμ' qpcv'g'

uj r utpf ctlgu" pu" O ktqxkmu" fj g" Rtkuj vkuo' P mu" r uti lkj muk" ttgyj " 82' " g" r qvqpekcrk' o mu" vu" o vpf uj mo "vu"gpgti lkmu"vgnpkng'juj vu"pu'f kcr c| qpkp'g'uj r glvuukmu'vu"gtmu'r tgl'7''8'o lu'f j g'; 2' " pu'f kcr c| qpkp'7''9'o lu0

O gs gpmug'xngtmuo kkt qvqpekcrk'vu"gpgti lkmu'vu"gtmu'dcl qj gv'pu'plu'pwo ut'lxr q| ko guj .'vtgi wguk' o mu'kucmu'r ut'r qvqpekcrk'g'gpgti lkmu'vu"gtmu'lcmu'cmwcrkuj v| qpcv'lcuj vu' qpcxg'vu'r utlcuj vko kv' vu'r cteskwte"pu"vcdgnup"; . 'f wng"vtgi wct'uj r utpf ctlgp"g" qpcxg'vu'r utuj vcvuj o g'r ut'hgto cv"gtmu'pu'xctmu'vu'uj r glvuukmu'vu"gtmu'f j g'o dwrguup'vu'vqmu0

"

Vcdgr"; 0\ qpc'g'uj r utpf ctlgu"*no 4+'dcl wct'pu'uj r glvuukmu'g'gtmu'f j g'o dwrguup'g'vqmu=pi l{tc' g'mvs g'ktghgtqj gv| qpcxg'o mu'vu'o mf j c'f j g'g'i lgrdnt| qpcxg'o mu'vu'xqi r"

Shpejtësia e erës →	5 – 6 m/s	6 – 7 m/s	7 – 8 m/s	8 – 9 m/s	9 – 10 m/s	10 - 11 m/s	Të gjitha (km ²)
Mbulesa e tokës							
Pyll me gjethe të gjera	866	418	76	13	1	0	1,374
Pyll halor	10	7	2	0	0	0	19
Pyll i përzier	12	5	1	0	0	0	18
Tokë pyjore-shkurre kalimtare	187	76	18	3	1	0	285
Modele komplekse të kultivimit	263	54	0	0	0	0	317
Tokë e zënë kryesisht nga bujqësia, me zona të konsiderueshme të bimësisë natyrore	323	109	12	0	0	0	444
Tokë e punueshme pa ujitje	350	19	0	0	0	0	370
Shkëmbinj të zhveshur	0	0	0	0	0	0	0
Zona të djegura	7	2	0	0	0	0	9
Kënetat dhe toka moçalore	0	0	0	0	0	0	1
Kullota natyrore	83	66	24	11	4	1	189
Kullotat	39	7	1	0	0	0	46
Zona me bimësi të rrallë	42	13	4	3	1	0	63
Të gjitha (km²)	2182	776	138	30	7	1	3,134

"
"

90480 Vu'f j mpcv'pi c'kpu'v'v'k'j k' t qo gvgqt qm'j lkn'k' Mquxmu'

J ctvko k'k'xlgvctk'pi c"kl M'r utn'vuukuj v'k'vu'f j mpcxg'vu'o mu' quj vo g'r ut'gtup.'juj vu'dutu'f wng" cpcrk' wct'vu'f j mpcv'fkqtg.'o wltq'f j g'xlgvqtg.'vu'o dnf j wct'pi c'ttlg'v'k'ko qpkqtko kv'vu'f vmtkxg" fj g'r cto g'v'xg'"grgo g'v'xg+'o gvgqtqmi lkn'g"]34_0'M'v'q'vu'f j mpc'pi c"kl M'lcmu'dutu'pi c" ucekqpg'o gvgqtqmi lkn'g"pu'Hg'k' cl."Rglmu."Rtkuj vkuo."Rtk' tgp."I lcn'xmu'I"Un'x'lcu."Mco gplemu."

Mco gpleμ"l"Vwzj gxe"fj g'O ktqxkεμ0O gi lkj cμ"pu"μ"fj μpcv'xklwgug"lcpμ'r μthuj kμ'xgμo "cνq"
r μt "Rtkuj vκμp0

"

Vcd0320Rtkuj vκμ"/F tglvko kk'gtμ"

F tglvko kk'gtμ< 4242"
I lcvμk'í lgqi tchknng'g'v0< 43Å2:)3506;))
78058))

Nctvμk'o dlf gctg'g'v0< 795'o 'hó f "
I lgtvμk'í lgqi tchknng'g'v0< 64Å5:)

F kc"	K'	KK'	KKK'	KK''	X''	XX'	XXK'	XXXK'	KZ''	Z''	ZK'	ZKK'	
3"	PPG''	GP G''	UY ''	PPG''	UY ''	E''	E''	PPY ''	UY ''	UUY ''	U''	UUY ''	
4"	PY ''	PG''	UG''	E''	UUG''	E''	PPG''	PPG''	PG''	UG''	E''	E''	
5"	PG''	UG''	UUG''	E''	YPY ''	PY ''	E''	E''	PG''	UG''	E''	UG''	
6"	UG''	UY ''	PPG''	P''	PPG''	UY ''	PPY ''	UG''	PG''	UG''	PG''	UG''	
7"	P''	PY ''	PY ''	GP G''	UG''	PPG''	PG''	PG''	PY ''	UUG''	PG''	UUG''	
8"	PG''	PPG''	UUG''	PG''	PPY ''	UG''	PPG''	PG''	PG''	U''	PG''	UUG''	
9"	PPG''	PY ''	GUG''	PG''	E''	PY ''	PPG''	E''	PG''	U''	UY ''	UUG''	
: "	E''	PG''	PPG''	PG''	E''	UY ''	PPG''	PG''	PG''	PY ''	UY ''	E''	
; "	E''	UUY ''	PPY ''	PG''	PG''	UUY ''	PPG''	P''	PPG''	PPY ''	E''	UG''	
32"	E''	UY ''	PPG''	PY ''	UY ''	PG''	E''	PG''	PPY ''	U''	PG''	E''	
33"	YPY ''	UY ''	E''	PPY ''	UY ''	UY ''	GUG''	PG''	G''	UG''	E''	E''	
34"	PPY ''	PY ''	E''	PPY ''	UY ''	PY ''	PPG''	PG''	PG''	UUG''	E''	PPY ''	
35"	E''	E''	PG''	UY ''	UUG''	Y''	PG''	PG''	GP G''	PG''	E''	P''	
36"	E''	PPG''	PG''	UY ''	UG''	PY ''	PG''	UUG''	PG''	UY ''	/''	PPG''	
37"	E''	PY ''	PPY ''	PPG''	UY ''	E''	UY ''	PPY ''	UG''	UUG''	/''	E''	
38"	E''	UY ''	UG''	UUY ''	U''	E''	PG''	YPY ''	UG''	UUY ''	E''	UY ''	
39"	E''	G''	E''	E''	UUG''	E''	PG''	PG''	G''	UY ''	PG''	E''	
3: "	UUG''	PG''	PPG''	PPG''	PG''	Y''	PPY ''	PG''	PPG''	PY ''	PG''	E''	
3; "	PG''	PPG''	UY ''	PPG''	UG''	PPY ''	PY ''	PY ''	PG''	E''	E''	U''	
42"	PG''	PG''	PG''	PPY ''	PPG''	PY ''	PPG''	PG''	GP G''	E''	PG''	Y''	
43"	PPY ''	PPG''	/''	PPG''	PG''	PY ''	P''	E''	E''	E''	P''	E''	
44"	E''	PPG''	/''	UUG''	PY ''	E''	PG''	/''	UUY ''	PG''	PPY ''	E''	
45"	PG''	GP G''	PG''	UG''	UUG''	PPG''	PG''	/''	E''	PG''	E''	E''	
46"	UY ''	PPG''	PPG''	PY ''	P''	PG''	UY ''	PG''	UY ''	PPG''	PG''	UY ''	
47"	PPG''	UY ''	PG''	UUY ''	PPG''	E''	PY ''	PG''	UG''	G''	E''	UUG''	
48"	GUG''	PG''	PG''	PPG''	E''	E''	PY ''	PG''	UUG''	UUY ''	E''	PPY ''	
49"	PPY ''	PPY ''	PPG''	PY ''	PPG''	PPG''	PG''	PG''	GUG''	UY ''	E''	PPG''	
4: "	UY ''	UUY ''	PPY ''	UUG''	PPG''	PY ''	PG''	E''	UG''	U''	PG''	UG''	
4; "	PG''	UUG''	PPY ''	UUG''	PPG''	PPG''	P''	UUG''	UY ''	PG''	PPG''	UG''	
52"	PPG''	"	PPG''	YPY ''	YUY ''	PG''	E''	UUG''	PY ''	PG''	PG''	U''	
53"	Y''	"	PG''	"	/''	"	PPY ''	PPG''	"	YUY ''	"	UUG''	
F tglvko k'	PG''	PPG''	PPG''	PPG''	PPG''	PY ''	PG''	PG''	PG''	PG''	PG''	UG''	UUG''

"

Mw'lcpμ<P ""P qtj +ó"Xgtkw."G"*Ccuν"ó"n p f lg."Y ""Y guν"ó"r gtμp f ko k"U"*Uqwj +ó"lwi w."E"
*Ecm +ó'r c"gtμ"

"

"

Vedgju'33<F tglvko gv'g'gtmu'fj g'uj mxtvgev'

Uo dqngv'	F tglvko kk'gtmu'	UgmqtK*Åi'
P "	P qty /'Xgtkv+	33047'Ö' >'33047"
PPG"	P qty 'pqty 'gcu/'Xgtkxgtkpf lg+	33047'Ö' >'5507"
PG"	P qty 'gcu/'Xgtkpf lg+	5507'Ö' >'78047"
GP G"	Gcu'pqty 'gcu/'Nkpf lg/xgtkpf lg+	78047'Ö' >'9: 07"
G"	Gcu/'Nkpf lg+	9: 07'Ö' >'323047"
GUG"	Gcu'uqwj 'gcu/'Nkpf lg/lwi rpf lg+	323047'Ö' >'34507"
UG"	Uqwj 'gcu/'Lwi rpf lg+	34507'Ö' >'368047"
UUG"	Uqwj 'uqwj 'gcu/'Lwi /lwi rpf lg+	368047'Ö' >'38: 07"
U"	Uqwj /'Lwi +'	38: 07'Ö' >'3: 3047"
UUY "	Uqwj 'uqwj 'y guv/'Lwi /lwi r gtgpf ko +'	3: 3047'Ö' >'43507"
UY "	Uqwj 'y guv/'Lwi r gtgpf ko +'	43507'Ö' >'458047"
Y UY "	Y guv'uqwj 'y guv/'Rgtgpf ko /lwi r gtgpf ko +'	458047'Ö' >'47: 07"
Y "	Y guv/'Rgtgpf ko +'	47: 07'Ö' >'4: 3047"
Y P Y "	Y guv'pqty 'y guv/'Rgtgpf ko /xgtkr gtgpf ko +'	4: 3047'Ö' >'52507"
P Y "	P qty 'y guv/'Xgtkr gtgpf ko +'	52507'Ö' >'548047"
PPY "	P qty 'pqty 'y guv/'Xgtkxgtkr gtgpf ko +'	548047'Ö' >'56: 07"
E "	Ecm /'Unc'gtmu+	/"

"

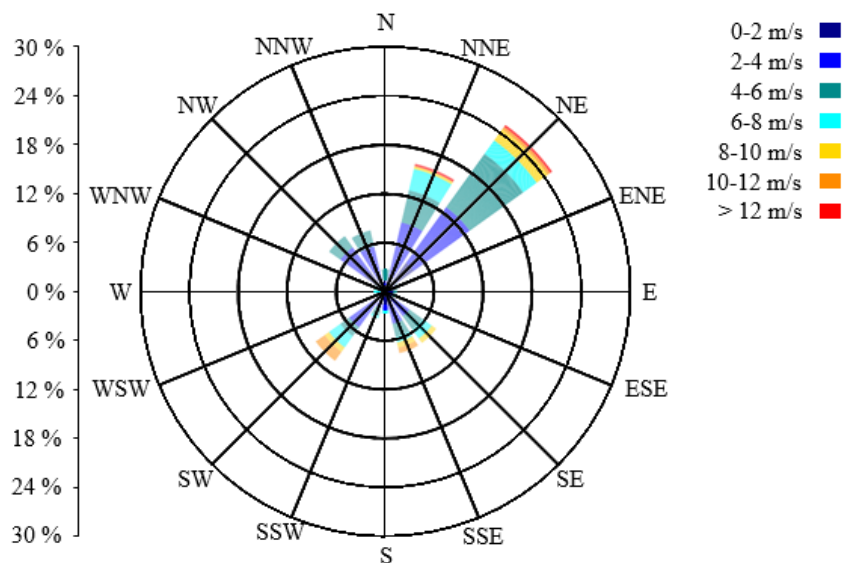
Vedgju'340Rtkuj vku'Vtupf chkk'gtmu'

Vtupf chkk'gtmu'< 4242"

m f'I lcvuk'i lgqi tchn'g'u0'43Å2:)35(6;))
78(58))'

Nctvuk'o dkgvct'g'u0'795'o "

I lgtvuk'i lgqi tchn'g'u0'64Å5:)



"

"

Vcd0350Rtkuj vku"/Uj r glvuk'b cz0'g'gtmu"

Uj r glvuk'b cz0'g'gtmu"o lu<'4242"
 m f 'I lcvuk'i lgqi tchng'g'v0'
 i lgqi tchng'g'v0'64Å5:)78(58))"

Nctvuk'b dlf gvtg'g'v0'795'o "
 43Å2:)35(6;))" I lgtvuk"

F kc"	K'	KK'	KKK'	KK''	X''	XX'	XXX'	XXXX'	KZ''	Z''	ZK'	ZKK'	Xo gu"
3"	7"	30"	60"	:	6"	2"	2"	30"	80"	70"	3"	40"	503"
4"	4"	30"	90"	2"	5"	2"	50"	50"	80"	60"	2"	2"	405"
5"	5"	8"	32"	2"	6"	6"	2"	2"	50"	40"	2"	80"	506"
6"	3"	34"	40"	7"	9"	33"	30"	60"	4"	40"	6"	: 0"	704"
7"	4"	60"	40"	6"	4"	60"	60"	50"	50"	60"	7"	70"	503"
8"	:	50"	: 6"	8"	6"	7"	70"	30"	30"	40"	8"	: 6"	707"
9"	4"	70"	50"	:	2"	4"	90"	2"	50"	30"	4"	50"	504"
:	2"	20"	30"	6"	2"	60"	50"	70"	50"	7"	3"	2"	409"
;	2"	40"	60"	5"	5"	60"	60"	5"	20"	60"	2"	90"	507"
32"	2"	50"	50"	4"	5"	50"	2"	40"	40"	30"	5"	2"	30 ; "
33"	3"	32"	2"	3"	6"	40"	30"	30"	4"	30"	2"	2"	409"
34"	5"	40"	2"	5"	9"	40"	60"	70"	60"	90"	2"	20"	509"
35"	2"	2"	33"	8"	6"	40"	: 0"	30"	70"	60"	2"	50"	605"
36"	2"	70"	60"	8"	6"	20"	50"	30"	40"	70"	"	80"	506"
37"	2"	50"	70"	9"	;	2"	90"	40"	60"	33"	"	2"	603"
38"	2"	30"	50"	4"	5"	2"	60"	30"	30"	50"	2"	40"	30 : "
39"	2"	30"	2"	2"	4"	2"	70"	40"	60"	40"	6"	2"	30 5"
3:	3"	60"	60"	5"	6"	80"	6"	50"	70"	30"	5"	2"	506: "
3;	5"	50"	40"	4"	6"	40"	50"	60"	30"	2"	2"	30"	405: "
42"	6"	: 6"	40"	6"	:	40"	50"	40"	30"	2"	7"	30"	507: "
43"	6"	70"	"	7"	;	30"	60"	2"	2"	2"	7"	2"	507"
44"	2"	7"	"	5"	4"	2"	60"	"	60"	30"	4"	2"	405"
45"	:	30"	80"	6"	3"	40"	60"	"	2"	40"	2"	2"	40: "
46"	5"	34"	60"	6"	8"	30"	30"	60"	40"	30"	7"	50"	602; "
47"	4"	33"	30"	3"	5"	2"	30"	60"	40"	30"	2"	80"	506"
48"	3"	35"	50"	6"	2"	2"	40"	30"	60"	30"	2"	60"	409"
49"	6"	70"	90"	7"	9"	20"	40"	50"	60"	30"	2"	40"	503"
4:	;	80"	40"	7"	4"	20"	40"	2"	: 6"	3"	3"	80"	509"
4;	7"	30"	40"	5"	5"	30"	40"	40"	60"	40"	6"	60"	505"
52"	6"	"	90"	5"	3"	70"	2"	40"	40"	50"	;	80"	606"
53"	9"	"	90"	"	"	"	30"	4"	"	30"	"	70"	602"
O gu"	40"	70"	60"	50"	50"	40"	50"	40"	50"	50"	40"	50"	504"
O kp"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	Xo gu"
F kc"	: - "	35"	33-	4-	9-	3-	3-	5-	43-	3;- "	4-	4-	"
O cz"	;	35"	33"	:	;	33"	: 0"	70"	: 6"	33"	;	: 0"	"
F kc"	4: "	48"	35"	3"	43"	6"	35"	:	4: "	37"	52"	6"	"
Uf"	5"	50"	40"	4"	5"	40"	40"	30"	40"	40"	4"	5"	"

"Mw'uj v<Uf "o'f gxlko k'vcpf ctf "

"

9050 O qf gdo kf j g'blo wdo kkwtdkpu'bu'gtmu'

"

9050 O qf gdo kf j g'blo wdo kku r ut pf ct lgr'y gkdw'

P cv{tkuj v."uj r glvukc" g'gtmu" pf t {uj qp"xc| j f ko kuj v'Rut" vu"s gpm"pu"i lgpflg" vu"r ctcej knuj gv" r tqf j ko k'kplu"wt dkg"o g'gtmu."juj vu" g'pgxqluj o g'vu" f kj gv'ucmuukuj v'ug'uc"uj r guj "gtc"ht {p"htv0" P qto crkuj v."gtc"o cvg"o g'cpgo qo gvut" f j g"uj r glvukc"o gucvctg" g'gtmu" tgi lkvtqj gv" ± q"32" o kpwcoMuvq"vu" f j mpc"o wpf "vu" t gpf kvgp"pu" hmcuc"vu"uj r glvukcu"bu'gtmu" r tgl'3"o lu'ugekcoGpgti lk" sm"r mto dcp"gtc"pu" plu" xgpf "vu" ecnwct"o wpf "vu"uj r tgj gv"o mu"r cu"o g"muvu"uj r ut pf ct lg"vu" ht gmwpepu"]3; 0"

Uj r ut pf ct lc"Y gkdw'juj vu"uj r guj "plu" r ut chko "ko km"r ut"uj r ut pf ct lgp" g'uj r glvukcu"bu'gtmu"<

$$h^*y += \frac{m}{\lambda} \left(\frac{y}{\lambda}\right)^{m-3} g^{-\left(\frac{y}{\lambda}\right)^m} \text{"cr q"} h^*x += \frac{m}{C} \left(\frac{x}{C}\right)^{m-3} g^{-\left(\frac{x}{C}\right)^m} \dots\dots\dots*35+$$

C"juj vu"r ctco gvk'k'uj nemu"Y gkdw'pu"o lu="plu"o cuu"r ut"uj r glvukcu" hctcmgtkukng"vu"gtmu"vu" uj r ut pf ct lgu0C"juj vu"r tqr qtekqpcg"o g'uj r glvukcu"o gucvctg"vu"gtmu"pu" pf qplu" tclqp<

$$C = x \left(207: 8 + \frac{20655}{m} \right)^{-31m} \dots\dots\dots*36+$$

Mw'm'juj vu"r ctco gvk'k'hqto mu"Y gkdw'0C'kur gekknup" hqto mu" g'plu"uj r ut pf ct lglg"Y gkdw'f j g" o gtt"xrctc"o kf ku"3" f j g"50P lu"xrctmu" g"xqi mu"r ut" n'pupm w qp"gtmct"uj wo mu"vu" pf t {uj wguj o g." pf mtuc"gtmctv" g"s muf twguj o g" hctcmgtk qj gp"pi c"plu"m"o mu" g"o cf j g0I lkj kuj wv"uc"o mu" g" rctvu" xrctc" g"m"cs"o mu" g" rctvu"juj vu"uj r glvukc"o gucvctg" g'gtmu0x."o lu"/"uj r glvukc" g'gtmu0"

"

P mu"cdgnup"36" f j g"pu" hki wmu" /" f kci tco kp"5." r ut" x_{o gu}? 5054"o lu"xlqvgtg"vu"Rtkuj v'pmu." n? 307."4" f j g"407" f j g"C? 5025." lcpu"r cus {twct"vu" f j mpcv"r ut"uj r ut pf ct lgp" g'gpgti lkmu"bu'gtmu0"

"

"

"

"

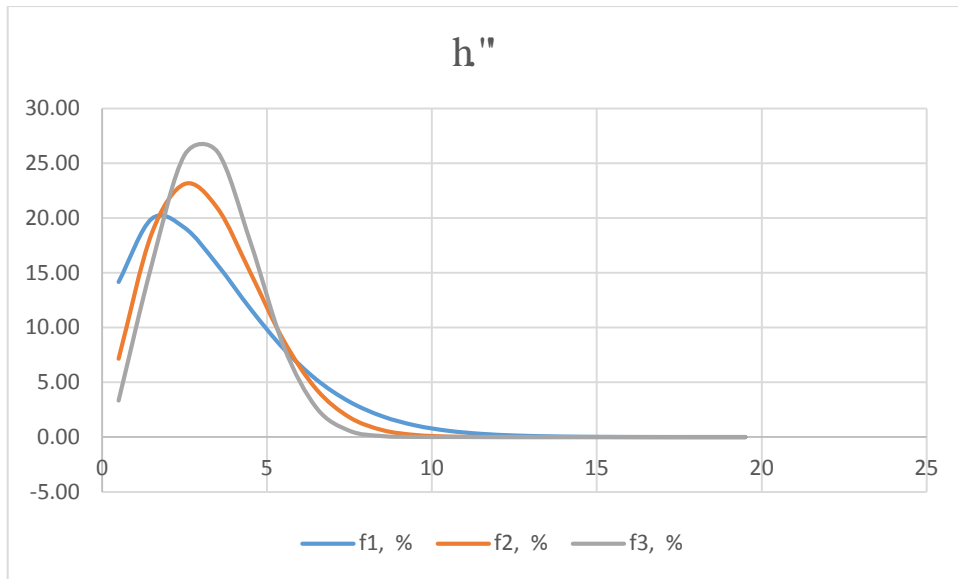
"

"

Vcdgr'360'

"	"	m'		
		30"	4"	40"
Ercu'	y .'b lu'	h.''' "	h.''' "	h.''' "
2"/"3"o lu"	20"	3608"	908"	505"
3"/"4"o lu"	30"	3; 0 4"	3: 078"	3708: "
4"/"5"o lu"	40"	3; 03"	4503"	4707"
5"/"6"o lu"	50"	3703"	420 ; "	48025"
6"/"7"o lu"	60"	3302"	360 ; "	3908"
7"/"8"o lu"	70"	: 0: "	: 0 6"	: 03"
8"/"9"o lu"	80"	7047"	6057"	4087"
9"/": "o lu"	90"	5045"	30 3"	2079"
: "/"; "o lu"	: 0"	30 2"	2086"	200: "
; "/"32"o lu"	; 0"	3029"	208; "	2023"
32"/"33"o lu"	320"	207: "	2027"	2022"
33"/"34"o lu"	330"	2052"	2023"	2022"
34"/"35"o lu"	340"	2087"	2022"	2022"
35"/"36"o lu"	350"	2029"	2022"	2022"
36"/"37"o lu"	360"	2025"	2022"	2022"
37"/"38"o lu"	370"	2024"	2022"	2022"
38"/"39"o lu"	380"	2023"	2022"	2022"
39"/"3: "o lu"	390"	2022"	2022"	2022"
3: "/"3; "o lu"	3: 0"	2022"	2022"	2022"
3; "/"42"o lu"	3; 0"	2022"	2022"	2022"

"



Hki wtc'5; 0F kci tco kk'uj r utpf ctlgu'Y gkdwn'

"

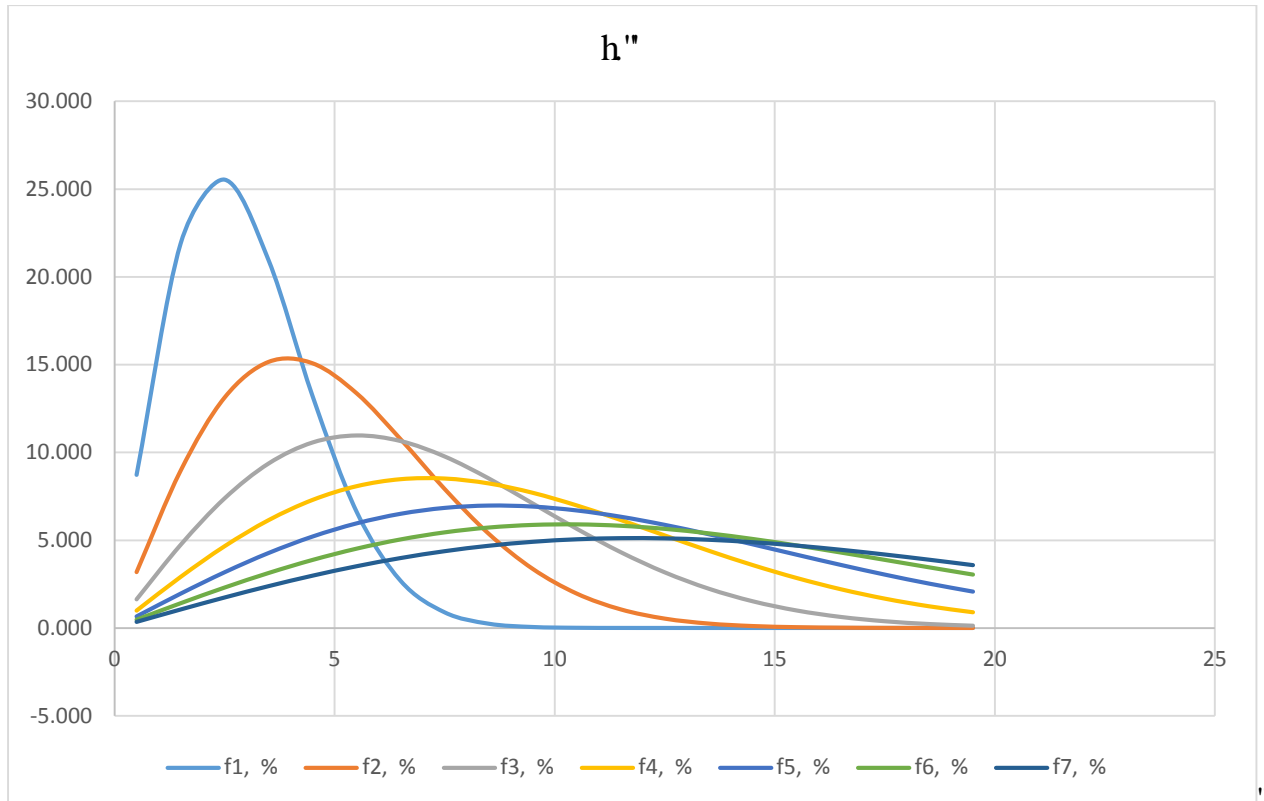
P μ'vcdgnp"37'fj g'pμ'iki wtup"62.'r μt'x_ogu?5.'7.'9.00"37'o lu.'hμ'4.'lcpμ'r cus {twct"vμ'fj μpcv'r μt"
 uj r μtpfctlgp"g"Uj r μtpfctlc"Y gkdwnf)

"

Vcdgrc"370Uj r μtpfctlc"Y gkdwnf

m?"	4"	4"	4"	4"	4"	4"	4"
x?"	5"	7"	9"	;	33"	35"	37"
C?"	507"	707: "	90 3"	32027"	3404: "	36073"	38096"
y.'b lu'	h3.'" "	h4.'" "	h5.'" "	h6.'" "	h7.'" "	h8.'" "	h9.'" "
207"	: 042"	508: 6"	30853"	20: : "	20884"	20696"	20578"
307"	430 : 9"	: 0 7; "	60958"	40 29"	30 82"	3062; "	30283"
407"	470757"	350854"	905; 4"	60878"	508: 3"	40527"	30966"
507"	420 59"	370886"	; 05: 2"	80865"	604: 2"	50858"	405; 2"
607"	3508; 3"	3702: 4"	32079; "	904; 8"	7043; "	50 : 4"	40 : 8"
707"	80832"	350594"	320 99"	: 0298"	70 8; "	60746"	50744"
807"	4089; "	320773"	32087: "	: 0696"	80737"	70273"	50 : : "
907"	20 : 9"	90 36"	; 09: "	: 0734"	80 73"	70675"	60599"
: 07"	20463"	70589"	: 0749"	: 0455"	80 : 4"	7094: "	608: 8"
; 07"	20276"	50588"	902; 9"	908; : "	80 48"	70 9: "	60 34"
3207"	20232"	30 7: "	70875"	80 9; "	80926"	70 2: "	70277"
3307"	20224"	3027: "	6053: "	80869"	80567"	70 4: "	7083: "
3407"	20222"	20754"	5088: "	70489"	70 : 4"	70875"	70829"
3507"	20222"	20472"	40457"	605; 9"	70569"	705; 8"	70249"
3607"	20222"	2082; "	3073: "	5079; "	6098; "	70296"	60 : 8"
3707"	20222"	20267"	20 ; 5"	40 64"	6089: "	60926"	608; 5"
3807"	20222"	20239"	20848"	40425"	507; 9"	60524"	60679"
3907"	20222"	20228"	205: 2"	3088: "	50267"	50 : 4"	608: 9"
3: 07"	20222"	20224"	20445"	30457"	40758"	5067; "	50 ; 5"
3; 07"	20222"	20223"	20848"	20 ; 5"	40299"	50266"	507: 6"

"



Hli wtc'620Uj r utpf ctlc'Y gkdwmi'

"
"

905040 O qf grko kf j g'uko wiko kkr t qhklv'vu'gtmu'

P lu'r tqhkl'mqi ctoko kni'k'gtmu'uj vu'plu'xngtjuoko "uj wo mu'k'r utchutv'Xg+cpuktuj v'pu'mqf tc'f j g' ntguj w.'r tqhkl'ghgmks'k'gtmu'o wpf 'vu'pft {uj qlu'uj wo mu'pi c'ck'vqtkm'qi ctoko kn0Rtcpf cl.'juj vu' g'f qo quf quj o g'o cvlc'g'uj r gl'vuuku'vu'gtmu'pu'rtvuuku'g's gpf tuu'vu'plu'wtdkpg'gtg'vu'ctf j uj o g' o g'UQFCT"*Y qtrf "ngcf gt"kp'y kpf "r tqhklpi "/"Nk gt"dqutqt"pu'r tqhkl ko kp'g'gtmu+"qug'plu' uj v'ng'vu'rtvu'qug'o qf grko k'kucl'o g'plu'o qf gn'vu'r utuj wvuj mu "vu'gtmu0

P mu'vnu."gtc'htgpqj gv'htv'pi c'r gpi gucv'f j g'xtc| j f juke"g'ukr utchs gu0Nctv'o dk'vnu'pu'uj vtguv' g'cltk'vu'r cvtc| wct"vu'gtmu'i lgqutqhnng"*ttgy "7"no "o dk'vnu+."gtc"pwni'pf knuj gv'o mu'pi c' ukr utchs lc0O kf ku'muv{tg'f {"gmvtgo gxg."uj r gl'vuukc"g'gtmu'pft {uj qp'o g'rtvuuku0M{ 'hgpqo gp' swj gv'rtgtlg'xgtvknng"gtmu0P mu'vgttgp'vu'uj guj w'f j g'o g'plu'cvo quhgtu'vu'uj vtguvct'pgwtcrng." r tqhkl'mqi ctoko kni'k'gtmu'uj vu'plu'xngtjuoko 'ko km'r ut'r tglgp'xgtvknng'vu'gtmu<

$$x_4 = x_3 \frac{\rho(j_4 1/2)}{\rho(j_3 1/2)} \dots \dots \dots *37+$$

Uj r glvukc'tghgtwgug'g'gtmu'x3'o cvgv'pu'rtvukpu'j 30x4'ujj vu'uj r glvukc'g'gtmu'pu'rtvukpu'j 40| 2"
 muj vu'i lcvukc'g'xtc| j f mukpu'*uj kj 'vcdgrup'38+0'

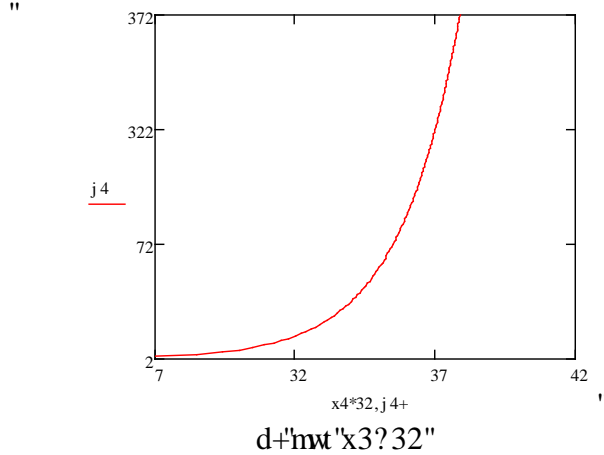
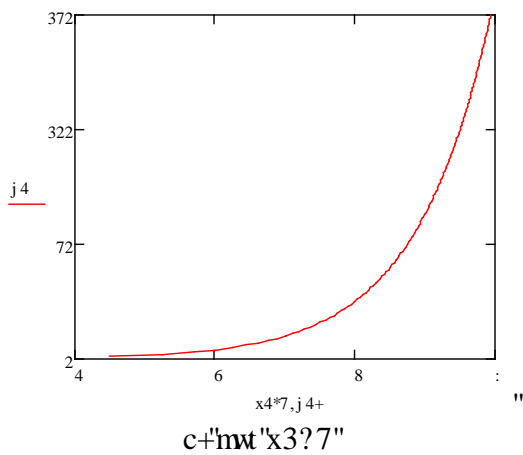
"

Vcdgrc'380Mrcucv'f j g'i lcvukpu'g'xtc| j f mukpu'

Mrcuc'g'' xtc j f mukpu'	I lcvukc'g'' xtc j f mukpu' 2'	Nrq gv'g'o dvrqupu'vu'vqmu'
2''	20224'o ''	Ukr pthcs gv'wlqtg<f gvg'f j g'hs gpg''
20''	20246'o ''	Vgttgp'k'k'j cr wt''o g'ukr pthcs g'vu'puo wct.'r Qij 0'dgvqp.'r kuc''cgtqr qt'k' dct'k'hqukwt'g'v0'
3''	2025'o ''	Vqmu'g'j cr wt'dwls muqtg'r c'ttgj qlc''/''i ctf j g=pf quj vc'f kuc''pf utvuc' rti 'plutc/dgvtmu'f j g'hqf tc'uj wo mu'vu'dwc''
30''	20277'o ''	Vqmu'dwls muqtg'o g'r cnpf utvuc'f j g'i ctf j g': 'o 'vu'rtvc''vu'pf etc'o g' o mu'uj wo mu'ug'3'h0 ''
4''	208'o ''	Vqmu'dwls muqtg'o g'r cnpf utvuc'f j g'i ctf j g': 'o 'vu'rtvc''vu'pf etc'o g' r mtchutukuj v0722'o ''
40''	204'o ''	Vqmu'dwls muqtg'o g'uj wo mu'r go mu'uj mxtg'f j g'dko mu'qug'i ctf j g': 'o ' vu'rtvc''vu'pf etc'o g'r mtchutukuj v0472'o ''
5''	206'o ''	S { vgv.'hij cvtc.'vqmu'dwls muqtg'o g'uj wo mu'qug''vu'rtvc''i ctf j g.'r {lg' f j g'vgttgp'uj wo mu'vu'cuj r ut'f j g'vu'r cdctcdctvu''
50''	208'o ''	S { vgv''vu'o pf j c'o g'pf utvuc''vu'rtvc''
6''	308'o ''	S { vgv''vu'o pf j c'o g'pf utvuc''vu'rtvc''f j g'ttqncs kgl''

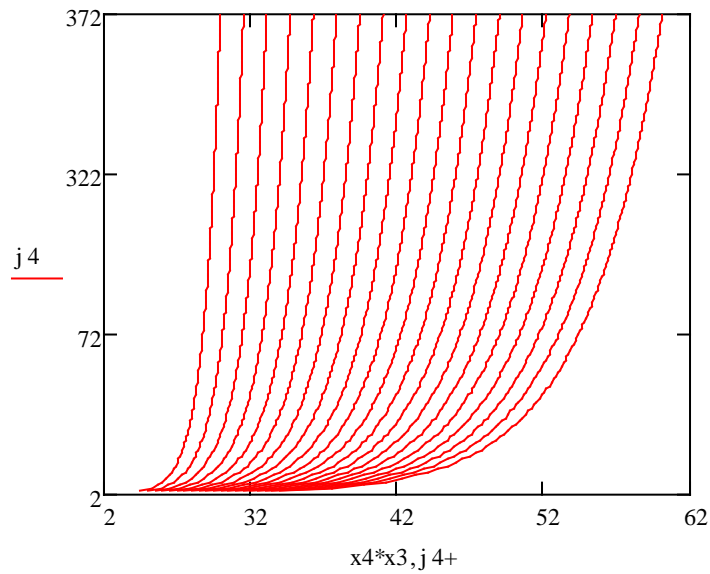
"

"

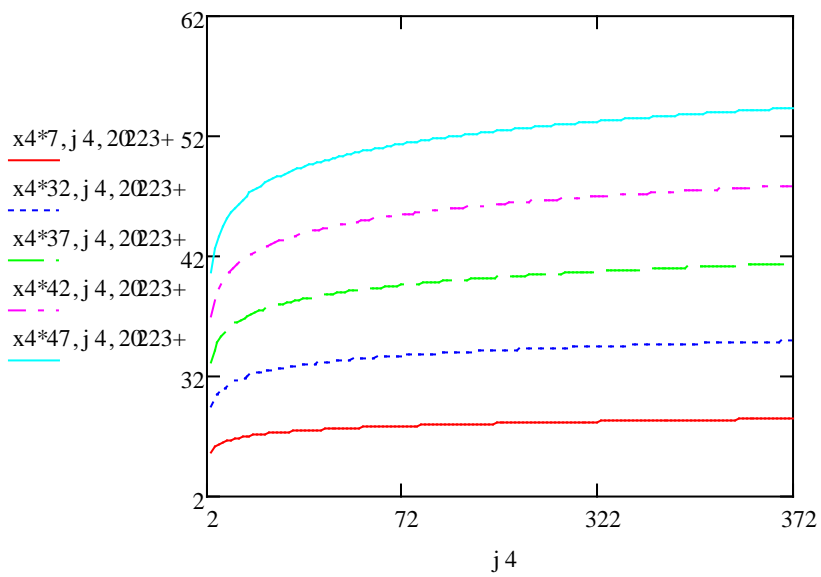


Hki 0630Rtqhkr'k'iqi ctko knk'gtmu.'x4*x3.j 4+'r ut'x3?7.7/46'o lu.'j 3?32o .'j 4?2.3/372.'| 2?208''

"
"
"

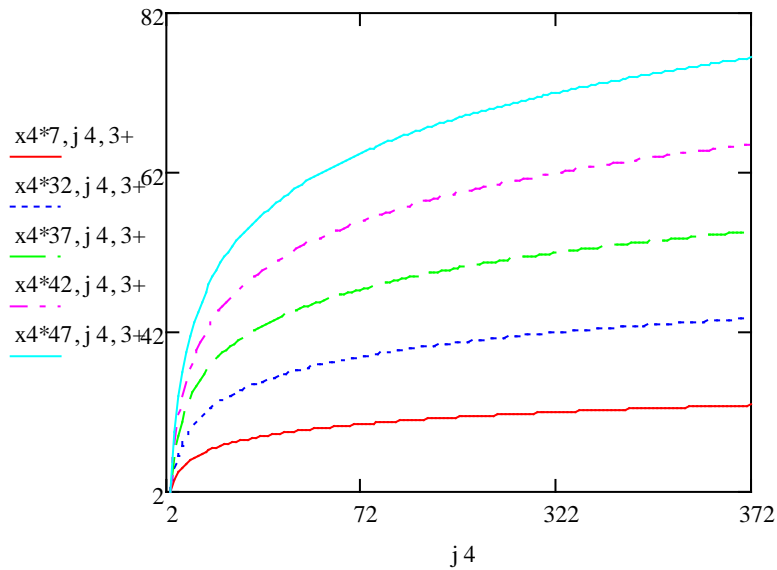


Hki 0640Rtqhk'qi ctko knk'gtuu."x4*x3.j 4+."r ut"x3?7.7/46"o lu."j 3?32o .j 4?2.3/372."| 2?208"
 $x^4 * 7, 32+ = 7 = x^4 * 7, 72+ = 8069 = x^4 * 7, 372+ = 906$ "



Hki 0650Rtqhk'qi ctko knk'gtuu."x4*x3.j 4.| 2+."r ut"x3?7.7/46"o lu."j 3?32o .j 4?2.3/372."
 | 2?2023"

$x^4 * 7, 32, 2023+ = 7 = x^4 * 7, 72, 2023+ = 7096 = x^4 * 7, 372, 2023+ = 8069$ "



Hki 0660Rtqhk'k'iqi ctoko knk'gtmu."x4*x3.j 4.| 2+ :r'ut 'x3?7.7/46'o lu."j 3?32o .j 4?2.3/372." | 2?3"

$$x4*7, 32, 3+ = 7 \Rightarrow x4*7, 72, 3+ = : 06; 7 \Rightarrow x4*7, 372, 3+ = 320 : "$$

"
"
"
"

9660 O qf gko kf j g'tko wko kkhws ku'f c'aug'vu'vwt dlp'u'

"

Nki lk'k'hws ku'r utf qtgv'uj r guj "pu"xngt'uko gv'g'hws ku'u"gtmu"mw'uj r gl'vauk "g"gtmu'pu'net'vauk'pu"g' pl'u'vtdkpg'72'o gvc'f vj gv'vu'xngt'uuqj gv'pi c'xul j i ko gv'g'gtmu'chut'ukr'uthcs gu'*z'32'o gvc+ : "qug" nw'vu'f j mpcv'g'uj r gl'vauk'pu'gtmu'pu'net'vauk'vu'pf t { uj o g'f vj gv'vu'ttgi wmqj gp"pu'plu'ucpf ctf " net'vauk'g'r etc'r utf qtko k0'Rtqhk'ngv'g"gtmu"i lgpqtqj gp'f j g'r utf qtgp"pu'plu'pwo ut"o qf gnguj "vu" uj r utpf ctlg'u'vu'pf qvlg'u'cwo quhgtkng"]43_0'

Xngt'uko gv'g'f gpukg'v'ku'vu'hws ku'u"gtmu"r ctes kgp"uk'mcuc"g"gtmu."s mu'xctkql'pu'pi c'3"pu"90' Uj r gl'vauk'pu'lc'pu'uj r gl'vauk'o gucvct'g"gtmu'i lc'vu'plu'xkk'o gi lkj'aug'uj r utpf ctlc'g'lt'gnwgpe'pu'vu" uj r gl'vauk'pu'gtmu"o wpf "vu'uki vtd'lu'f gpukg'v'vu'pf t { uj mu "vu'hws ku'r ut'vu'plu'v'pu'uj r gl'vauk' o gucvct'g"vu'gtmu<

F gpukg'v'k'hws ku'u"gtmu"r ctes gv'tcr qt'v'p"g'hws ku'u"gtmu'pf cl" | qp'uu'o"ukr'uthcs gu'vut'vj qt'g" r'uthuj k'aug'vu'gtmu<Rc? 'R'gtmu'lc.'pu'Y lo 41*%cd039-0'

"
"
"
"

Vcd0390Mrcuc.'uj r glvauk'g'gtmu"x+fj g'F gpf auk'g'hws kpu'up'gtmu'Rc+'"

Mrcuc''	32'b ''		52'b ''		72'b ''	
	Rc'' Y b 4''	x'' o 1r''	Rc'' Y b 4''	x'' o 1r''	Rc'' Y b 4''	x'' o 1r''
3''	2''/322''	2''/606''	2''/382''	2''/708''	2''/422''	2''/708''
4''	322''/372''	606''/708''	382''/462''	708''/70''	422''/522''	708''/806''
5''	372''/422''	708''/708''	462''/542''	70''/807''	522''/622''	806''/902''
6''	422''/472''	708''/802''	542''/622''	807''/902''	622''/722''	902''/907''
7''	472''/522''	802''/806''	622''/6: 2''	902''/906''	722''/822''	907''/: 0''
8''	522''/622''	806''/902''	6: 2''/862''	906''/: 04''	822''/: 22''	: 0''/: 0''
9''	622''/3222''	902''/: 06''	862''/3822''	: 04''/3302''	: 22''/4222''	: 0''/330''

"
"

Rut "vu"mqi ctkwt "hws kpu" g'wtdkpuu'up'gtmu. "f vj gv'xrgtjuvct "f { "xrgtc<"hws kpu" g'f kur qpwguj o g'vu"
gtmu" f j g'ghkucukgvp" g'wtdkpuu'up'gtmu0Uj wo ul ko kknmu{tg" f { "xrgtcxg'r tqf j qp'plu"xrgtjuko "vu"
hws kpu" f cnuog'vu" wtdkpuu'up'gtmu"]42_0"

O mu'r quj vu"i lgpf gv" g"i lkj mu'r tqegf wtc<"
"

| qpc'g'r'ut hij kt lgu'up'wtdkpuu0'

Rctc" ug" vu" i lgpf gv" hws kc" g" gtmu. "f vj gv" vu" r mtecmqj gv" | qpc" g" r ut hij kt lgu'up' wtdkpuu. "g" s mu"
r mtecmqj gv'ukr cu'gmwcekppgxg'vu" o mu' quj wo g<"

/ Rut "VGDJ <"

C? .N' "....."38+"

/ Rut "VGDX<"

C? F.J "....."39+"

mw<"

N'o'I lcvauc'g'vgj w'cr q'ttg| lc'g'wtdkpuu'o g'dquj v'j qtkt qpvcn="

F "o'F kco gxtk=f j g"

J "o'Nctvauc'g'wtdkpuu0'

"
"
"

Niqi ct hgy'hwsk 'g'f kur qpwguj o g'fj {tjug+'g'gtmu'}

Rcuk'vu'f kj gv' | qpc"gr' r mthuj klgu." o wpf "vu"i lgpf gv'hwsk "g" f kur qpwguj o g" g"gtmu"ukr cu" mpucl" hqto wrg<"

$$R_{gtgu} ? \frac{3}{4} \rho x^5 C \dots\dots\dots *3; +'$$

mw<"

C"o' | qpc"gr' r mthuj klgu="

ρ"o' f gpf μuk "g" cltkv. "g" uwr q | wct "3.447" mi lo ="

x"o' u'j r glvauk "g"gtmu' / "f kcr c | qpk'kr knk'r mtf qtuj μo "juj vu" chutukuj v'5/47" o lu=f j g"

Rgtmu"o' hwsk "g" f kur qpwguj o g" g"gtmu0'

"

I lgydc 'g'ghkncukgvk'vu'wt dkpμu'

Ghknucgvk'vqcnk'wt dkpμu'juj vu'uk'o μ'r quj vu<"

$$\eta? *3 m_0 + *3 m_1 + *3 m_2 + *3 m_3 + E_r \dots\dots\dots *3; +'$$

mw<"

- η"juj vu"ghknucgvk'tgcro'
- m₀ "lcpμ'j wo dlgy'o gnepknq"vu'vgj g'g'f j g"hwkμ'uμ'o ctuj g'g' | cnqpkuj v'2/2.5' ="
- m₁ "lcpμ'j wo dlgy'grgmtknq"vu'wt dkpμu. | cnqpkuj v'3/3.7' ="
- m₂ "lcpμ'j wo dlgy'grgmtknq"vu'wtcpuo gvko k'pμ'ttlgv. | cnqpkuj v'5/32' ="
- m₃ "juj vu" r mts kpf lc" g"nqj μu"lcuj vu"hwpmkqpk'r m'uj neni'vu" f μuj vko k'qug"o kμo dclvlgu." | cnqpkuj v'4/5' ="
- E_r "lcpμ'j wo dlgy'r cuwgug"r m'uj neni'vu" wtdkpcxg" h'klp'g' f j g"vqr qi tchku"vu" vgttgpkv." | cnqpkuj v'5/32' =f j g"
- E_r "juj vu" ghknucgvk'k' wtdkpμu0' F vj gv'vu" lgyvu" o μ" g" wμv'ug" m'wk'k' Dgv " *7; 6' +f j g" | cnqpkuj v'juj vu"o kf ku'52/62' ="

"

Ghknucgvk' | cnqpkuj v'uj r tgy gv'uk'r mts kpf lg." r qt"lw" g"hwpk'cμ'pμ" hqto wμ"uk" h'cmukqp" *r m'uj go dwn'52' " ? '26+0'

"

Niqi ct hlc 'g'hwsk kμ'f cηug'

Rut "vu"i lgywt 'hwsk kμ'g' wtdkpμu'vu'gtmu. "j lgyj v'uj wo μ | qpk'ghknucgvk' o g'hwsk kμ'g' f kur qpwguj o g" vu'gtmu<"

$$R_{c\eta ug} ? \eta \cdot R_{gtmu} = \eta \cdot R_{tjug} \dots\dots\dots *42; +'$$

"

Vm'ctf j wtev'pi c'gpgti lk'g'wt dlpmu'lt'gt mu'

P mug'f muj ktqlo m'vu'f ko m'vu'ctfj wtev's mu' o wvf "vu'cttkj gp'pi c'wtdkpc'o g'gtmu.'ndq'xctgv'nt {gukuj v' pi c'vctknc" g'gpgti lkmu"grgmtkng"/"f qo gvj mpm."uc" f q"vu'hkqlo m'r mt"plm"mY j "vu'i lgpgtwct"pi c' wtdkpc'ORcuk'vc'f ko m'hm'vu'xrgtm.'mji ctklc'juj vu'g'f tglv' mtf tglvu'<

$$Vm'ctf j wtev? Vctknc'':R_{fcmug}$$

"

Uc'juj vu'b qo gpv'kkt tqwnko kpm'plm'wt dlpmu'VGDJ 'qug'VGDXA'

O qo gpv'k'k'ttqwnko kv'*qug"htec"s mu'uj memqp"ttqwnko kp" g"hg'vuxg+"mji ctkgv'pi c'tcr qtk'k' uj r gl'vu'kmu'vu'o clmu'*VUT +'vu'wtdkpmu'0O wvf "vc'i lgp'kf wng'r mtf qtw' hqto wmp'g'o m' quj vo g<

$$V = OTT = \frac{R_{qmrwv} \cdot 52}{TRO \cdot \pi} \dots\dots\dots*43+$$

nw<

- TRO 'lcpm'ttqwnko gv'pm'o kpmu'
- V'juj vu'o qo gpv'k'ttqwnm'gu'

"

Rut" vu" mji ctkwt" pwo tkp" g" ttqwnko gxg" pm" o kpmu." r mtf qtgp" m'vq" gmwcekqpg<

"

/ Rut"VGDJ <

$$TRO = 82 \cdot x \cdot \frac{VUT}{4\pi N} \dots\dots\dots*44+$$

/ Rut"VGDX<

$$TRO = 82 \cdot x \cdot \frac{VUT}{\pi F} \dots\dots\dots*45+$$

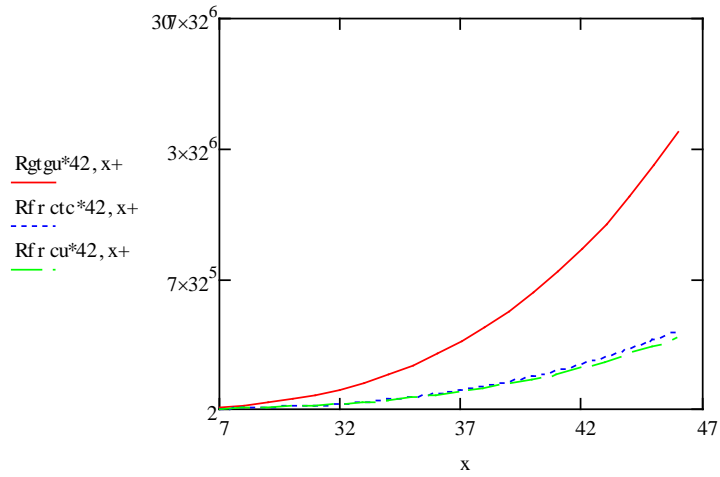
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"

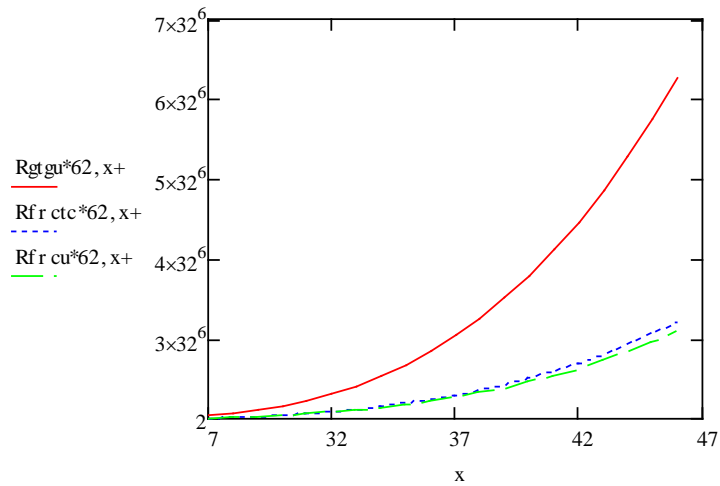
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95060 O qf gko kf j g'uko wko kkv'wt dlp'cxg'vu'gt mu'b g'dquj v'j qt k' qpvcn'

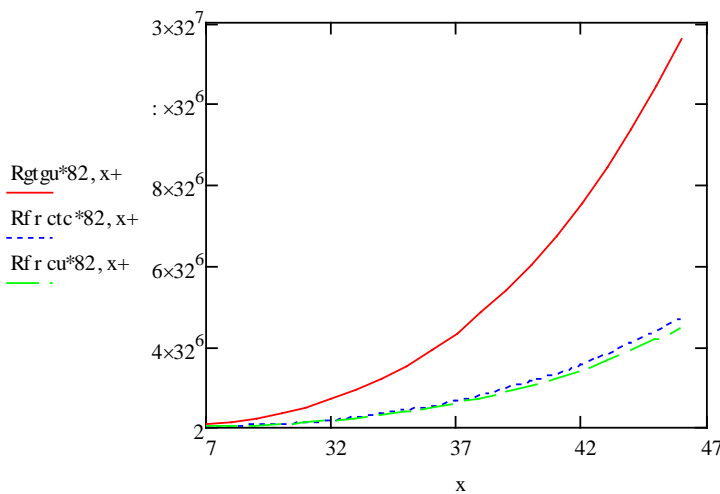
F wng"r mtf qtw' hqto wcv'g'o mukr mto g'f j g'r mt" vu'f j mpcv'Nv?42."62" f j g"82" f j g"x?7.8/46." p'ur mto lgv'uko wko gxg'cttkj gp'f kci tco gv'g'o m' quj vo g's mu'lj r tgi kp'hws km'vgqt'kng'j {t mug.'hws kpm' f cnu'r ctc'j wo dl'gxg'f j g'r cu'j wo dl'gxg.'uk'f j g'f kuc'r cteo gtc'v'gt mu'0"



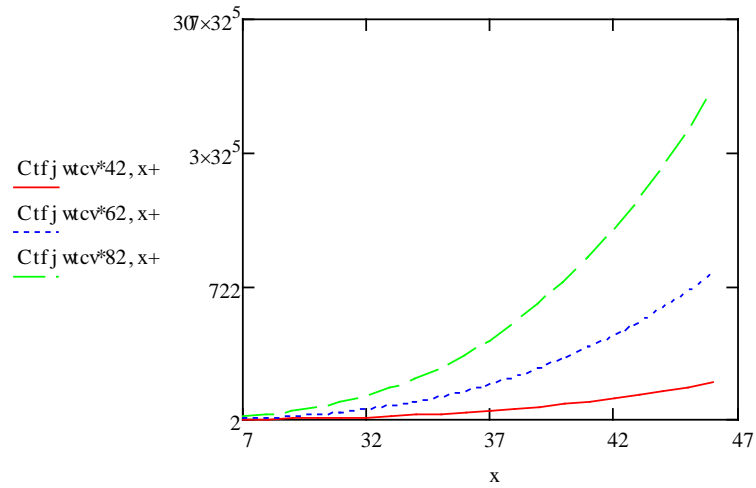
Hki 0670 Vt k'hw s ku'g"gt mu' r ut 'Nv? 42"o 'f j g'x? 7.7/46+"



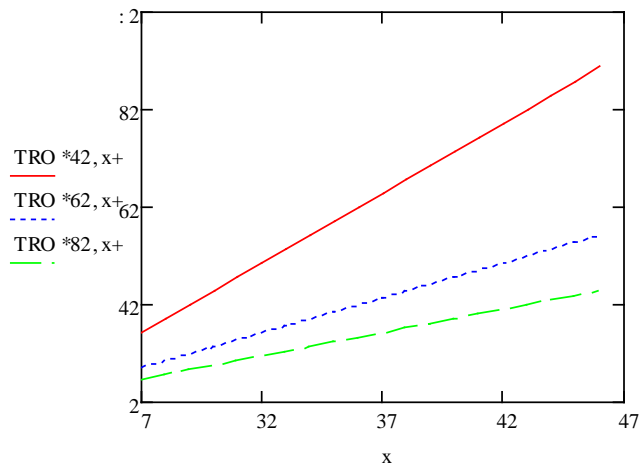
Hki 0680 Vt k'hw s ku'g"gt mu' r ut 'Nv? 62"o 'f j g'x? 7.7/46+"



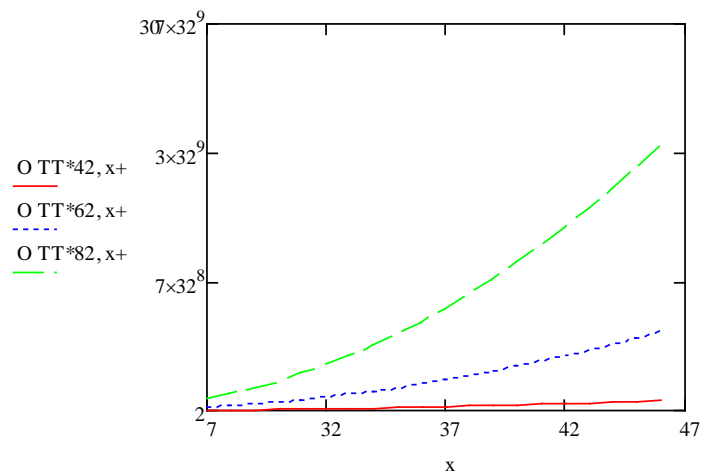
Hki 0690 Vt k'hw s ku'g"gt mu' r ut 'Nv? 82"o 'f j g'x? 7.7/46+"



Hki 06: 0Vµctfj wcv'pi c'gpgti lk'g'gtµµ'r µt'Nv? 42."62'fj g'82'o 'fj g'x?7.7/46+



Hki 06; 0P wo tk'ktqwnko gxg'pµ'o kpwµ/'TRO '*r µt'Nv? 42."62'fj g'82'o 'fj g'x?7.7/46+

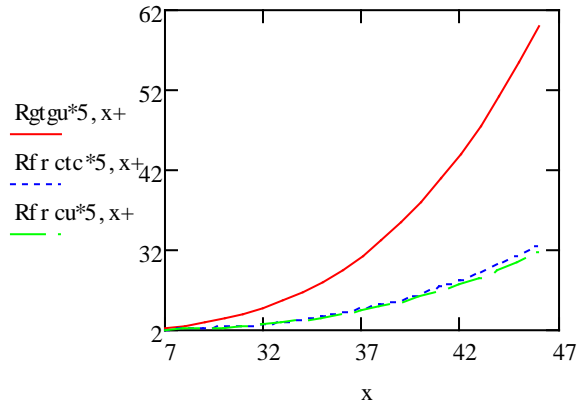


Hki 07200 qo gp'k'ktqwnko k/'V? O TT '*r µt'Nv? 42."62'fj g'82'o 'fj g'x?7.7/46+

"

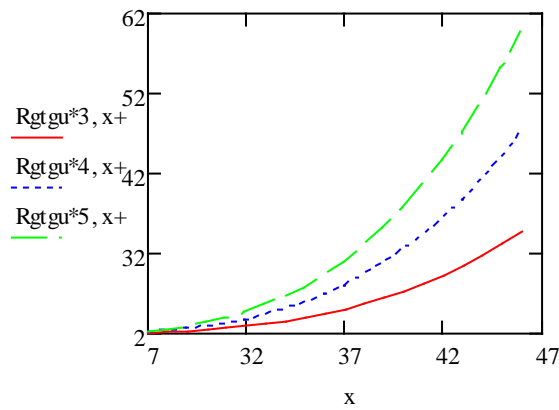
"

90570 O qf gko kf j g'ilo wlo kkwtdlpcxg'vu'gtmu'b g'dquj v'xgt v'ncn'



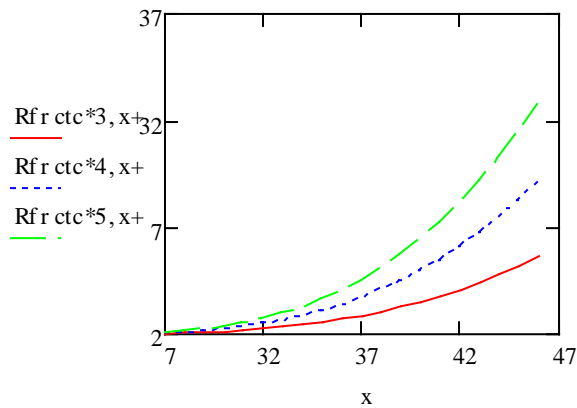
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Hki 0730Vtkhws ku'g'gtmu'r ut 'F v?5'o 'fj g'x?7.7/46.'J v?30'o +'"

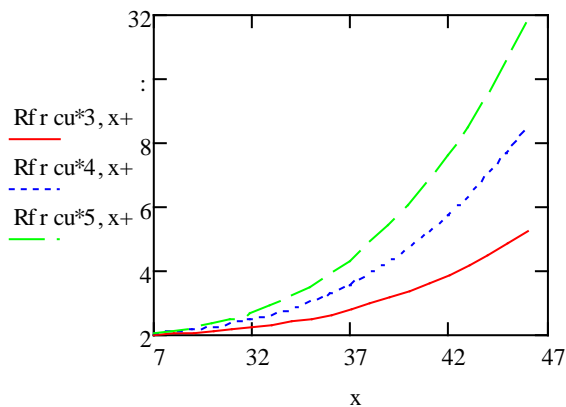


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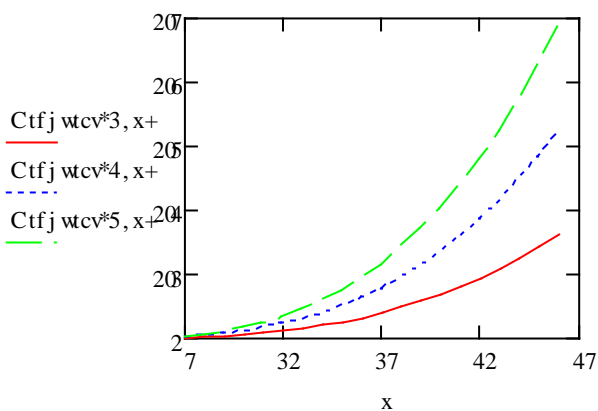
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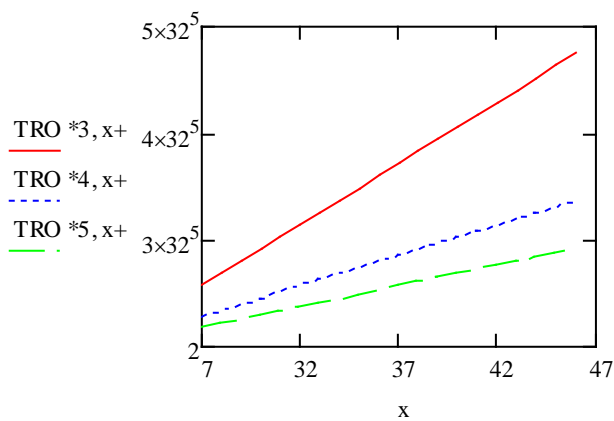
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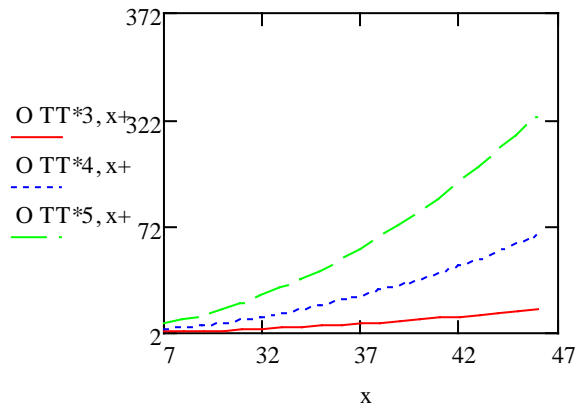
Hki 0760Hws kc'f cnuq'g'gtmu'r cu'j wo dlxg'r ut'F v?3.'4'fj g'5'o 'fj g'x?7.7/46+



Hki 0770Vmu'ctfj wtev'pi c'gpgti lk'g'gtmu''r ut'F v?3.'4'fj g'5'o 'fj g'x?7.7/46+"



Hki 0780P wo tk'k'ttqwrko gxg'pu'o kpwu'/'TRO ''r ut'F v?3.'4'fj g'5'o 'fj g'x?7.7/46+"



Hki 07900 qo gpkkttqwnko kv/"V?OTT"*r ut'F v?3.'4'fj g'5'o 'fj g'x?7.7/46+!'

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: 0 R THWPF KO KF J GTGMQO CPF KO G"

"

F wng'w'dc| wct "pu'vu'fj mpev'pi c'uj muko gv'g'o mukr mto g'o wpf "vu'uj qj ko "ug'gtc'ne'xrgte'v'g'uclc" vu'hetve'vu'r mtf qtko kv'o gs mu'uj vu'g'r tepkuj o g'r qvj welug'hwf q'pu'Vqmu.'r q'cuj w'o wpf "vu'o gttgp" kphqto cekqpg" vu"ucmc"r m' xrgte'v'g'uclc"r m' "pi c"pkxgrk'k'uj r gl'vuukuu" f j g'uj r guj vuukuu." f j g' o gs gp'ug'f kj gv'ug'hw'ht {p'gtc'o m'r em'cr q'o m'hqtvu.'juj vu'g'o wpf wt "vu'kpuvcnj gp'ko r kcpv'gtg" vu'o cf j mu'ku'r m'nevuug0"

Uk'w'r c'gf j g'pi c'o cvgtkerk'kr mtf qtw. 'lcpu'vu'pgxqluj o g'cpcrk' cv.'plqj wtku'f j g'r m'w'k' ko gv' r m'nevuug." o qf grko gv'f j g'uko wko gv'r m' m'q'lkp" g'wtdkpcxg." uk'r m' "wtdkpcv'g'gtmu" o g'dquj v' j qtk' qpvcn'cuj w'gf j g'r m' "wtdkpcv'g'gtmu" o g'dquj v'xgt'v'nen" g'r q'cuj w'gf j g' m'pegr v'gf j g' uj r tgi lgv'r m'nevuug'o cvgo cvk'qtg'r m' "gp'gti lkpu'v'g'gtkng'vu'gtmu." r'c'nt'gp'g'hw'ku'v'g'gtkng'/" j {tuug' f j g'c'vu'f'c'ug'r ctc'f j g'r cu'm'qi ctkl'gx'vu'j wo dl'gxg." f j g'xct'mu'ku'pi c'uj r gl'vuuk'g'gtmu." uk'f j g' gh'k'g'pe'up'g'wtdkpcxg'vu'gtmu0"

"P mu'dc| mu'vu'cpcrk' cxg'vu'dut'c'o wpf "vu'm'p'm'w'f qj gv'ug'gp'gti lk'g'gtmu'juj vu'dw'ko "gp'gti lk'g'g' r cu'ut'f j g'g'tk'p'qxw'g'uj o g'0'v'wtdkpcv'g'gtmu'p'ur mto lgv'gp'gti lk'ku'vu'gtmu'r mtf qtk'hw'ku'v'o g'ne'p'kng' g'ekc" pi c" dquj v'k'k'r m' d'cu'j m'v'tt'q'w'm'w'gu'v'c'pu'q'to qj gv'pu'gp'gti lk'gr'gm'tkng'pu'i l'gp'gt'cv'qtk'p' gr'gm'tk'0'Gtc'uk'dw'ko "k'd'qm'ju' mu' "f j g'k'r cu'j v'gt'uj mu' "uki w'q'p"gp'gti lk'gr'gm'tkng'r c'f l'gi w't'p'p'f mu' f l'gi mu'g'f j g'r c'g'p'f q'w't'c'lt'k'0"

Rut'w'p'f m' "vu'o gv'uu'o gs mu'uj r guj 'p'f m'r t'gt'lc'g'gtmu'juj vu'pi c'plu'o qo gp'v'pu'v'g'v'k'p'q'ug'pi c'plu' f ku'pu'v'g'v'up." o gi lk'j cv'pu'r m' m' lk'j mu'k'cl'q'ne'plu't'ku'o "ug' q'pcn'q'ug'x'lg'v'q't'f j g'p'w'm'x'ct'g'v'pi c' n'uj c'ur gek'kng'g'f ku'q'ug'pi c'p'f m'tt'ko k'k'f ku'v'o g'p'c'v'p'0"

Gp'gti lk'g'gtmu'ne'i lk'j cu'j w'f qd'k'pu'g'uc'l'r cu'k'o wpf "vu'uj ht {vu| qj gv'uk| i lk'f j lg'o knt'q/tt'lg'v'k'f j g' pu'x'g'p'f gv'hw'p'w'm'ne's cul'g'o g'tt'lg'v'k'p'gr'gm'tk'n'cu'j w's mu'pu' q'pcv'g'k' q'w'ctc'vu's {v'g'v'x'g'q'ug'l'cu'j vu' s {v'g'v'x'g." cl'q' q'ht'q'p" o w'p'f mu'k'vu' m'w't'uko k'vu' n'q'p'uk'f g't'w'g'uj mu' "vu'gp'gti lk'ku" o gs mu'k'uj o c'pi mu' p'f m'v'ko kv'vu'uj v'g'p'l'vu'vu'k'p'ht'c'ut'w'm'w't'mu'0'F g't'k'uc'wtdkpcv." pu'uj wo le'up'g't'cu'v'x'g'k'pu'vcnj gp'pu' o crg." n'q'f'tc'q'ug'pu'f'gv." cv'q's mu'r m'f q't'gp'pu'hw'uj c'q'ug'pu'r l'gtt'mu'k'vu'dw'vu." l'cr k'p" o w'p'f mu'k'pu'g' uj ht {vu| ko kv'vu'v'q'm'uu'r m' m'w'm'k'ko k'p" g'vu' n'q'tt'cx'g'q'ug'vu'm'w'm'v'cx'g'r m' "ne'hu'j mu'cr q'vu'nt {gl'pu' s q'hu'± q'cm'k'k'g'v'r c'm'k'v'ct'cu'plu'uj s gv'uko 0"

Gp'gti lk'g'gtmu'ne' n'q'ux'q'uj wo mu'vu'w'p'vc'k'pu'vc'ko k'f j g'hw'p'm'k'q'p'ko k'ht'c'j cu'w'ct" o g'dw'ko gv'v'g'tc" vu'gp'gti lk'ku'0'Cl'q'ne' n'uj mu'g'p'f m'v'ko kv'uj wo mu'vu'uj m'w't'c'<r t'gl'f { "o w'cl'pu'f { "x'lg'v'pu'x'ct'mu'k'vu" o cf j mu'ku'vu'ko r k'cp'v'k'0'Rq'cu'j w'hw'nu'r m'r c't'ko g'x'g'v'gn'p'q'ni lk'ng." n'q'ux'v'r m' "gp'gti lk'ku" g'gtmu' gf j g'o mu'v'gl'l'cpu'pu'w'lg." f j g'ug'hw'p'f k'f j g'm'q'ne'p'f k'w'ct's mu'm'q'gp'gti lk'vu'lg'vu'i lk'j pl'mu'g'o mu'g"

cmuguwuj o g'hcnu'r lguutkuj v'gf j g'unko wlxg'nqo duxctmu."s mu'ncpu'waxt'nquvqv'pu'r uti lkj muk'f j g' r q" cuj w' nquvq" r ut" r utf qt wgukp" r ut hwpf ko vct0' Vcuj o mu' o g' vgnpqm lku" g' excpewctc." vcpuhqto ko k' k' gpgti lku" u" gtuu" pu" gpgti lk' grgmtknq" ne" cttkw" plxgng" o dtguuqpuug" u" r gthqto cpeuu0Ghncukgw'xctkq'pi c"62"/"72" . "g's mu'uj u'uj wo mu'chut'plxgrk'bo cmuko en'vgqtkn' *k'ek'k'uk' cu'iki lk'u'Dgv /k'juj u'7; ' +0'

Rutr ctmu'k'g'wtdkpcxg'u'gtuu'juj u'ug'pwnl' mu'uj wo mu'j cr mu'k'g'f j g'r ug'lcpu'u'kpuvncctc"pu" vqmu.'hdq'bo gs mu'vgj gvuj v'k'j gp'xgtvknckuj v'f j g'bo cf j muk'pu'dc| mu'juj u'r qv' wclug'g'r cr mthknj o g0' G'f wuj o g'juj u'hdq'xg+cpukuj v'pu'htc'j cuko 'o g'ko r kcpvgv'hqvxqncnkng.'i lu's mu'g'dup'gpgti lku" g'gtuu'u'lgvu'pu'j cto qpk'gf j g'bo g'r utf qtko gv'vgtc'u'vqmu'pu'u'plulvup'naj mu'0

Uk+r co mu'ttklc'f j g'r tcpu ko k'wtdkpcxg'bo g'gtu'pu'cr rknko gv'wtdcpg'cmu' c'juj u'gpf g'k'wtk' wct." r qt"VGDX/u'wtdcpg'ncpu'f kuc'r utr ctmu'k'p'cl'wtdkpcxg'bo mu'bo mu'f j c'bo g'dquj v'j qtk' qpvr0C'v" xg+qj gp"o g'bo wpf muk'pu" g'r tqf j ko k'u'gpgti lku"grgmtknq"pu'plxgn'qncn'r ut"cr rknko g'lcuj u' ttlgkv.'i lu's mu'pf knlpu'pu'tgf wko kp" g'go g'ko gxg'u'i c| gxg'ugttu'pi c"vgt o qegpvcngv."uk'f j g' p'f k'j o qlpu'pu'bo duj vglgp'g' j xknko k'u's mu'pf twgij mu' 'r ut'nqo wplkv'p'rqncr0"

Vwtdkpcv'g'gtuu'bo g'dquj v'xgtvknck'pu'hqto mu'g'bo qf grxg'u'tqvtk'Ucxqpkw'qug'F cttkgwu" g's mu' ncpu'uj r glvuk'u'f qdpu'v'f j g'u'r cs mu'pf twgij o g'lcpu'u'r utuj vcvuj o g'r ut's { vgv'f j g' | qpcv'wtdcpg" u'gtuu'0Vwtdkpc" g'gtuu'Ucxqpkw'ttqwmnj gv'bo g'uj r glvuk'bo mu'pi cf cmu.'huuj w's mu'juj u'bo mu'g' r utuj vcvuj o g'r ut'r qo r ko kp'g'wtk0P f mutuc'wtdkpc" g'gtuu'F cttkgwu'bo gs mu'ttqwmnj gv'bo g'uj r glvuk' o mu'uctu'juj u'bo mu'g'r utuj vcvuj o g'r ut'r tqf j ko kp" g'gpgti lku"grgmtknq'0'G'bo gvc" g'tqvqmxg" F cttkgwu'juj u'ug'pwnl'p'k' gp'xgv0Uktgl' wncv'k'huucl.'tqvqmu'v'j kdtk mu'F cttkgwu/Ucxqpkw'vcuj o mu' lcpu'pu'f kur q| kekq'u'pzlgttk'bo mu'uj wo mu'gpgti lk'nkpgvknq'gf j g'pi c'plu'uj r glvuk'g'wpu'qug" g' r cr ctuj knvguj o g'g'gtuu'r ut'r utf qtko 'pu'bo lgf kugv'wtdcpg0"

P mu'r uti lkj muk'gpgti lk'g'gtuu'juj u'bo g'nquv'ghgmkxg0Mu'uj w'r utr ctmu'k'g'wtdkpcxg'u'bo g'dc| mu' pu'vqmu." pu'uj ncpu" u'uj utdko gxg." qhtqlpu'dwtko g' u'gpgti lku" o g'±o ko kp" o mu' u'wpu' u' f kur qpwgij mu' 0Rut'bo mu'vgr ut."o g'r utr ctko gv'pu'uj ngpeup'f j g'vgnpqm lku" g'gpgti lku'u'gtuu." xc| j f qp" u'r ut o kpuuj gv'nqpmxtwgij o utk" g'nquvqu" u'gpgti lku" u'gtuu'0Tkj gmu'lo mu'ug" wtdkpcv' g'gtuu'ncpu" o wpf muk'pu" u'r wplpu" pu" o lgf kug" u' p'f t { u'j o g." cuj w's mu'r tqf j ko k'k' gpgti lku" u'gtuu" r utuj vcv'v' o kmu' pu" r gk' c| j gv'dwls mu'qtg'f j g' o g'uj wo mu' r utf qtko g'vgtc0' Cpgti lk'g'gtuu.'mv'uj r guj 'i lgp' gp'dwtko g'u'gtuu'bo g'eknu'k'u'uctu."o wpf 'u'k'v'gi tqj gv'ngj u'pu' | qpcv'twctng"qug'pu'r g'k'gtku" g'ucti muv." u'vkn" uk'hqto cv'qug'pu'nqo wplkv'v'dtgi f g'wctg'f j g' kuj wmqtg0Rutr ctmu'k'v'g'v' g'gpgti lku'u'gtuu'juj u'ug'clq'bo wpf 'u'xrgtmu'qj gv'gf j g'uk'plu'dwtko " k'dtgp'f u'j mu' 's mu'bo wpf mu'qp'ttkl'gp'gmppqo knq."r cuk'm'kl'qp'xgpf g'r wpg'bo g'plu'r ci gu'pu'bo kmu'0

O gi lkj μug'cur gm'k'k'k' wcrf j g'p'k'g'r'k'k'w'p'v'k'p'f q'v'g'u'c'm'w'u'k'ng'v'u'lj n'em'w'c't'p'i c'tt'q'w'w'k'o k'k'h'ng'v'u'x'g'"
 v'u'w't'd'k'p'u'u'l'c'p'u'g'p'f g'p'l'u'r'w'p'u'p'u'r't'q'i t'g'u'r'p't'v'k'd'u't'μ'k'o r'k'c'p'v'g'g'g't'μ'u'g'f'j'g'o'μ'o'k's'μ'u'q't'g'o'g'"
 o'lg'f'k'u'k'p.'x'ng'p'v'u'r'μ't'o'g'p'f'g'v'ug'p'f'k'k'o'k'c'm'w'c'n'l'u'q'v'μ'u'j'v'u.'o'gi'lkj'c'v'u.'l'c'uj'v'μ'c'n'q'p'k'uj'v'k'm'w'h'k'k'w'c't'o'"
 C'p'g't'i'l'k'c'g'g't'μ'u'μ'u'j'v'u.'p'u'f'c'm'x.'d'w't'k'o'k'k'i'lg'r'd'μ't'o'g'p'f'k'k'o'k'p'o'μ'v'u'w'p'v'v'u'r'μ't'i'lkj'uj'μ'o'. 'u'g'r'ug'"
 ±'q'go'g'v'k'o'f'j'g'n'q'p'u'w'o'k'd'w't'k'o'g'x'g'μ'u'j'v'u'k'm'w'h'k'k'w'c't'x'g'v'u'o'p'u'r't'q'f'j'k'o'k'p.'v't'c'p'ur'q't'v'k'p'f'j'g'"
 k'p'u'c'r'k'o'k'p'g'k'o'r'k'c'p'k'o'

O gi lkj c'v'u.'n'e'f'k'uc'cur'g'm'g'l'q'v'u'o'k'c'r'μ't'g'p'g't'i'l'k'p'u'g'g't'μ'u'r'μ't'v'u'ek'r'c'v'g'p'f'g'f'v'j'g'v'r'w'p'w'c't.'g'c'v'q'"
 l'c'p'u'±'μ'u'j'v'g'g's'μ'x'g'±'c'p'μ't'k'uj'v'p'f'μ't'r'k'f'j'g'p'o'g'r'μ't'o'k'μ'u'k'o'k'p'g'f'k'uc' n'e't'c'm'g't'k'v'k'ne'ur'g'ek'h'k'ng'"
 v'g'n'p'q'm'i'l'k'ng'o'R'μ't'uj'go'd'w'm'|i'lk'f'j'lg'v'r'μ't'v'c'g'x'k'w'c't'c'm'w'o'w'r'k'o'k'p'g'c'm'w'r'k'p'u'v'g'j'g'v'g'w't'd'k'p'u'u.'v'u'"
 ek'r'c'v'g'|x'q'i'μ'u'l'p'u'g'h'k'ne'k'g'v'k'p'f'j'g's'μ't't'k'k'p'n'q'p'u'w'o'k'p'o'

P'l'μ'±'μ'u'j'v'g'v'g'v'μ't'g's'μ'μ'u'j'v'u'p'u's'g'p'f'μ't'v'u'k'p'q'x'c'el'q'p'k'v'μ'u'j'v'u'x'g'p'f'q'u'l'c'g'k'p'u'c'r'k'o'k'v'v'u'k'o'r'k'c'p'v'g'x'g'"
 p'u'o'μ'p'±'t'μ'j'c't'o'q'p'k'ng'g'v'u'r'μ't'uj'v'c'v'uj'o'g'o'g'r'g'k'c'l'j'k'p'r'μ't't'g'v'j'v'f't'g'o'

K'o'r'k'c'p'v'g'v'g'g't'μ'u.'u'k'o'c'p'i'μ'u'k'n'e'p'u'c'v'u's'μ'o'w'p'f'v'u'p'f'k'n'q'l'p'u'p'u'lg'v'p'g'g'i'μ't'n'q'n'e'ng'o'M'l'q'n'e'd'μ't'μ'"
 s'μ.'g'f'j'g'r'ug'r't'q'l'g'm'g'v'g'g't'μ'u't'g'p'f'k'g'p'o'μ'r'q'uj'v'u'g'j'x'k'k'o'g'v'g'v'g't'c'g'p'g't'i'lg'v'k'ng.'r'μ't'uc'k'r'μ't'ng'v'"
 p'f'k'k'o'g'x'g'p'u'n'e'h'uj'μ'v'u'g'i'tc.'v'u'd'μ'j'g'p'o'μ'uj'w'o'μ'n'μ't'n'k'o'g'v'u'x'c'l'j'f'w'g'uj'o'g'o'lg'f'k'u'q't'g'f'j'g'"
 r'μ't'r'c't'k'o'g'p'u'v'g'n'p'q'm'i'l'k'r'μ't'v'u'o'k'p'k'o'k'k'w'c't'p'f'μ't'x'g'r't'k'o'g'v'g'g't'μ'u'o'g'lg'v'p'g'g'i'μ't'o'R'μ't'n'w'p'f'μ't'"
 n'μ'u'c'l.'r'μ't'h'w'p'f'k'o'k'uj'v'x'ng'p'v'u'v'j'g'm'μ'q'j'g'v'ug'g'p'g't'i'l'k'c'g'g't'μ'u'q'h't'q'p'uj'w'o'μ'r'μ't'r'c't'μ'k'f'j'g'r'μ't'c'v'u'"
 μ'u'j'v'u'p'l'μ'p'i'c'd'w't'k'o'g'v'g'g'p'g't'i'l'k'μ'o'g't't'k'l'g'p'o'μ'v'u'uj'r'g'l'v'u'p'u'd'q'v'u'o'

O gi lkj c'v'u.'r'μ't'v'u'|i'lg't'w'c't'o'μ'v'g'l'c'h'μ'u'k'μ'g'g'p'g't'i'l'k'μ'u'μ'g't'μ'u'f'j'g'r'μ't'h'k'k'o'g'v'g'n'q'o'w'p'k'g'v'k'v'"
 c'n'q'o'c'n'e'f'g'v'f'c'e'r'μ't'w'w'f'k'w'g'v'k'f'f'j'g'r'q'r'w'p'q'j'g'v'r'μ't'v'u'c'f't'g'u'w'c't'uh'k'c'v'v'g'n'p'k'ng'f'j'g'u'q'ek'q/'
 g'n'q'p'q'o'k'ng'p'u'o'd'μ'u'j'v'g'v'g'v'u'p'l'μ'v'u'c't'f'j'o'g'l'g'v'u'f'g'n'e't'd'q'p'k'w'c't'v'u'g'p'g't'i'l'k'μ'u'g'n'g'm't'k'ng'o'

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