Kohato cwłap'f kuenaugf 'ap'ij g'Kowgt pgy'kp'' t grcwłap'ia'ij g'P aweg'ahij g'Gzwt cat f kpct { '' I gpgt cn'O ggwlpi 'ahiUj ct gj anf gt u''

The contents of the financial statements, etc. of Idemitsu Kosan Co., Ltd. for the most recent fiscal year (from April 1, 2017 to March 31, 2018)

Dwukpguu'Tgr qtv'	page 1-33"
Eqpuqrkf cvgf 'Dcrcpeg'Uj ggv'	page 34-35"
Consolidated Statement of Income"	page 36"
Consolidated Statement of Changes in Shareholders' Equity, etc."	page 37"
Notes to Consolidated Financial Statements"	page 38-51"
Non-Consolidated Balance Sheet"	page 52-53"
Non-Consolidated Statement of Income"	page 54"
Non-Consolidated Statement of Changes in Shareholders' Equity,	page 55-56"
etc."	
Notes to Non-Consolidated Financial Statements"	page 57-66"
Auditors' Report on the Consolidated Financial Statements (English	page 67-68"
Translation)"	
Auditors' Report on the Non-Consolidated Financial Statements	page 69-70"
(English Translation) "	
The Board of Statutory Auditors' Audit Report (English Translation)"	page 71-73"

The above items are disclosed on our website

(http://www.showa-shell.co.jp/english/ir/general_meeting/index.html) for shareholders' reference according to laws and Article 17 of the Articles of Association of the Company.

Showa Shell Sekiyu K.K.

(Security Code: 5002)

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*Cr tkri3.'4239'\q'O ctej '53.'423: +"

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Vj g'Icr cpgug''{gp''vq''WU'fqmct''gzej cpi g''tcvg''i gpgtcm{ "tgo ckpgf "y ky kp''c''uvcdrg''tcpi g'' qh''dgw ggp''Ø832 k&''cpf ''Ø837 k&'f wtkpi ''y g''r gtkqf ''htqo ''Cr tkri'y tqwi j ''F gego dgt0' ''J qy gxgt." y g''{gp''uvtgpi yi gpgf ''ci ckpuv''y g'WU'fqmct''chygt'Icpwct { .'i kxgp''y g'WU'cfo kpkuvtcvkqpøu''vqwi j '' vtcf g''f go cpf u''cpf ''y g''vgpug''ukwcvkqp''kp''U{tkc0' '' Vj g''cxgtci g''gzej cpi g''tcvg''f getgcugf ''d{ '' Ø407 k&'htqo ''y g''r tgxkqwu''hkuecn''{gct''\q''Ø8330 k&''

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Wpf gt" y gug"ektewo uvcpegu." y g"I tqwr øu"pgv"ucrgu"hqt"hkuecn' {gct"4239" y gtg" Ø5.95209" dkmkqp." wr "380, ' "htqo "y g"r tgxkqwu"hkuecn' {gct." o ckpn("f wg" \q"ucrgu"i tqy y i "kp" y g"r gwtqrgwo "r tqf wewl'ugi o gpv"j grr gf "d{"kpetgcugf "ko r qtv"r tkegu'hqt "etwf g"qkn")

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P gv'pqp/qr gtcvkpi 'kpeqo g'y cu'Ø4702'dkmkqp'*wr '64: 02' "{ gct 'qp"{ gct +: 'r tko ctkn{ 'j gnr gf '' d{ "cp"kpetgcug"kp"r tqhkv'qp"gs vkx{ "kp"gctpkpi u"qh"pqpeqpuqnkf cvgf "uwdukf kctkgu"cpf "chhkrkcvgu" y j kej "o ckpn{ "eqpukuvgf "qh"Uj qy c'Uj gm'Ugnk{ w'MMMou'kpetgcukpi 'r tqhkv.'y j kej 'ku'kpenxf gf 'kp" yj g"õQyj gtuö"ugi o gpv0' "Eqpugs wgpvn{ ."qtf kpct { "kpeqo g"y cu"Ø44805"dkmkqp."cp"kpetgcug"qh" 8309' 'htqo ''yj g"r tgxkqwu'hkuecn'{ gct0'

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Kpeqo g"vzzgu"kpenwf kpi "dqvj "ewttgpv'cpf "f ghgttgf "vz"gzr gpugu"y gtg"Ø6706"dkmlqp"*wr "Ø840; " dkmlqp" {gct+" tghrgevkpi " cp" kpetgcug" kp" kpeqo g" dghqtg" kpeqo g" vzzgu0' Eqpugs wgpvn{."vj g"ghhgevkxg" vz"tcvg" y cu"4306' "o ckpn{"f wg"vq"vj g"f gf wevkqp"qh"muugu" tgeqi pk| gf "kp"r cuv'{gctu"qp"vj g"uj ctgu"qh"uwdukf kctkgu"cpf "chhkrkevgu"y j kej "y gtg"s wcnkhkgf "d{" vj g"ucng"kp"hkuecn'{gct"42390'

Ewttgpv'pgv'lpeqo g"cwtkdwcdrg"vq"pqpeqpvtqrrkpi "kpvgtguvu"y cu"Ø60"dkrrkqp"*wr "; 20 ' " {gct"qp"{gct+'o ckpn{ 'tghrgevkpi "cp'kpetgcug'kp'r tqhkv'hqt'vj g'tguqwtegu'ugi o gpv0'

Cu'c'tguwn.''ewttgpv'pgv'kpeqo g''cwtkdwcdrg''vq''qy pgtu''qh''y g''r ctgpv''eqo r cp $\{$ ''y cu' $\/288405$ '' dkm\qp''*wr'': 605' '' $\{$ gct''qp'' $\{$ gct+0'

*kkk+" Rtqi tguu'cpf 'tguwnu'qh'dwukpguu<"

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	11 4236	11 4239	Co qwpv''	, ,,
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Tguqwtegu"	44905"	4: ; 06"	- 8403"	- 4905' "
Qyj gtu"	8508"	8; 0 "	- 804"	-;0'"
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Qr gtcvkpi 'kpeqo g'd { 'ugi o gpv'

*Wpkx<'QDkmkqp+"

			Ej cpi g'*	Fgetgcug+"
	Ң 4238"	Ң 4239"	Co qwpv''	1 11
Rgvtqrgwo "r tqf wewu" : excluding effect of	9902"	::08"	- 3308"	- 3703' "
inventory valuation	46.0	57.5	+11.5	+25.0%
Rgvtqej go kecn'r tqf wewi"	6202''	6404"	- 405"	- 709' "
Tguqwtegu"	3808"	880 "	- 7204''	- 52405' "
Qyj gtu"	703''	905"	- 404"	- 6506' "
T geqpektkcvkqp"	*506+	*508+	*204+	_
Vqv:n' : excluding effect of	35704"	42305"	- 8803"	- 6: 0; "
inventory valuation	102.1	170.2	+68.0	+66.6%

]Rgvtqrgwo "r tqf wewu'ugi o gpv_"

Kp''y g'r gytqrgwo 'r tqf wewi'ugi o gpv.''y g'Eqorcp{'ugv'cu'kwu'dcuke''uytcvgi {''y g'' tgkphqtego gpv'qh''y g'eqorgykkxgpguu''qh''y g'f qoguke''uwrrn{''cpf''o ctngykpi ''u{uygou''cpf''y g'' gzrcpukqp''qh'dwukpguu''kp''qxgtugcu''o ctngyu.''cpf''yqqn'y g'hqnqy kpi ''ceykqpuk''

*Hwgn'qkn'dwukpguu+"

Kp"yj g"uwr r n{ "qh"r gwtqrgwo "r tqf wewu."yj g"Eqo r cp{ "ecttkgf "qw"etwf g"qkm"r tqeguukpi " wcmkpi "uwr r n{/f go cpf "cpf "ucrgu"eqpf kkkqpu"kpvq"ceeqwpv."cpf "uwtkxgf "vq"r tqo qvg"tgf wewkqpu" kp"uwr r n{ "equvu'y j krg"uvkm'ugewtkpi "c"uvcdrg"uwr r n{ "qh"r tqf wewu"

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Cu'r ctv'qh'vj g''Dtki j vgt''Gpgti {''Cmkcpeg''y kyj ''Uj qy c''Uj gm''Ugmk{w'M0M0''yj g''yy q'' eqo r cpkgu''uvctvgf ''uj ctkpi ''uj kr r kpi 'hcekrkkgu''kp''Qevqdgt''4239''cpf ''kpvgi tcvgf ''ectf'' o go dgtuj kr u'hqt''eqtr qtcvg''ewuvqo gtu''kp''Cr tkr''423: .''cej kgxkpi ''eqpukuvgpv'i tqy yj ''kp'' dwukpguu''u{pgti {0'

Cu'hqt'dwukpguu'ghhqtwi'kp''qxgtugcu'o ctngw.''Kf go kuw'S: "Rgvtqrgwo "NNE 'ncwpej gf "ij g" ugtxkeg''uvckqp''dwukpguu'kp''Xkgvpco.''y j kej "j cf ''pqv'dggp''r tgxkqwun(''cwgo r vgf 'kp''y g''eqwpvt {" d{ ''c'hqtgki p''ecr kxcn'eqo r cp{0' " P i j k'Uqp'Tghkpgt {" cpf ''Rgvtqej go kecn'Eqo r rgz ''uvctvgf " uj kr r kpi ''r tqf wewi'kp'O c{"423: 0' " Kp''C wuxtcnkc.''y g'Eqo r cp{" ces wktgf "ij g''kpf gr gpf gpv'' r gvtqrgwo ''r tqf wewi'f kurkdwqt''Vtkpkv{ ''Rgvtqrgwo ''Ugtxkegu''Rv{ ''Nvf 0''uggnkpi ''q''gpj cpeg''j g'' r gvtqrgwo ''r tqf wewi'dwukpguu''kp''i tqy kpi ''qxgtugcu''o ctngw0' " Vj g'Eqo r cp{" vqqm'uvgr u'\q'' gpj cpeg''j g''uxtwewtg''qh''kwu''qxgtugcu''dwukpguu''j wdu''egpvgtkpi ''qp''KF GO KVUW'

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Vj g''qvcn'co qwpv'qh'nwdtkecpwi'uqnf 'kp'Lcr cp''cpf ''cdtqcf ''uwtr cuugf ''304''o kmkqp''nkmqrkwgtu." c''pgy ''j kuvqtkecn'tgeqtf ''j ki j .''i kxgp''y g''ucrgu''i tqy y ''kp''Cukc''cpf ''Pqty ''Co gtkec0' ''Oqtgqxgt." y qtmkpi ''vqy ctf ''y g''guvcdnkuj o gpv'qh''c'tqdww'ucrgu''cpf ''uwr r n{ ''uvtwewtg''hqt''y g'i mdcn'o ctmgv." y g''Eqo r cp{ ''vqqn''cevkxg''uvgr u''vq''wr f cvg''cpf ''tgguvcdnkuj ''kvu'o ctmgvkpi ''uvtwewtg''cpf ''tgkphqteg'' kvu''r tqf wevkqp''ecr cdkrkkkgu''cdtqcf 0'

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*Dcuke 'ej go kecnı'dwukpguu+'

Kp" yi g"dcuke" ej go kecnı" dwukpguu." yi g"Eqo r cp{" vqqni'uvgr u" vqy ctf "f kxgtukhkecvkqp" qhi'ugrevgf "tcy "o cvgtkcnı" d{ "ko r tqxkpi "gyj { rgpg"o cpwhcewtkpi "hcektkkgu" cv'Ej kdc"Ej go kecni'O cpwhcewtkpi "NNR." y j kej "ku" lqkpvn("qr gtcvgf" y kyj "O kuwk'Ej go kecnı." Kpe0' "Cnq. "wpf gt" c" hcxqtcdrg" o ctngv'gpxktqpo gpv." kv'o ckpvckpgf "yi g"uvcdrg" qr gtcvkqp" qh' kxu" o clqt "hcektkkgu" cpf "gs wkr o gpv'uwej "cu" o cpwhcewtkpi "hcektkkgu" hqt "gyj { rgpg" cpf "ctqo cvke" eqo r qwpf u. "yi gtgd { "gpuwtkpi "c"uvcdrg" uwr r n{ "qh'qrghkp" cpf "ctqo cvke" eqo r qwpf u" vq" r gvtqej go kecn' eqo r rgzgu" cu" y gm'cu'hqt" o cpwhcewtg" qh'yi g'Eqo r cp{øu'f gtkxcvkxg'r tqf wevu0'

*Cf xcpegf "o cygtkcnı"cpf "r gthqto cpeg"o cygtkcnı"dwukpguu+"

Kp"yj g"gpi kpggtkpi "r ncurkeu"dwukpguu."yj g"Eqo r cp{"cej kgxgf "ucngu"i tqy yj "kp"dqyj "yj g" f qo gurke" cpf "qxgtugcu" o ctngwu" qp" yj g" uxtgpi yj "qh" r qn{ectdqpcvg" tgukp" *Rtqf wev" pco g<" VCTHNQPÌ +:" yj g" r tqf wevkqp" uxtwewstg" qh" y j kej " j cf " dggp" eqpuqnkf cvgf " kpvq" Hqto quc" Ej go kecnı'("Hkdtg'Eqtr qtcvkqp"%õHEHEö+"qh'Vcky cp"qxgt"yj g"hcuv"{gct "cu"y gm'cu"u{pf kqvcvke" r qn{uv{tgpg"tgukp" *Rtqf wev' pco g<" ZCTGEÌ +" hqt" y j kej " yj g"Eqo r cp{" j cu" gzr cpf gf " yj g" r tqf wevkqp"ecr cekx{"qh'yj g"Ej kdc "Rgvtqej go kecn'Rncpv0'

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 $\label{thm:continuous} Vj g'Eqo r cp \{ \ 'f \ kxguvgf \ 'cuugvu'kp''y g'WMP qtyi \ 'Ugc''cu''r ctv'qh'kxu'r qtvlqnkq'tgcttcpi go gpv0'' \ Cf f \ kxkqpcm(."yi g"Eqo r cp \{ "j cu''vcmgp"ur gekhle"uvgr u"vqy ctf "f gxgmqr o gpv''qh''yi g"i cu''hkgnf "f kxeqxgtgf "qhh''yi g''eqcuv''qh''Xkgvpco 0'' \\$

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*Eqcn'dwukpguu'cpf 'qvj gt 'dwukpguu+'

 $\label{eq:linear_continuity} \begin{tabular}{l} $\partition{ \begin{tabular}{l} \partition{ \partition{ \begin{tabular}{l} \partition{ \begin{tabular}l} \partition{ \begin{tabular}{l} \partition{ \begin{tabular}{l}$

 $\label{eq:culling} Cu'lhqt''y' g''wtcpkwo ''dwukpguu.''y' g''Eqo \ r\ cp{''ugmu''wtcpkwo ''eqpegpytcygu''r tqf wegf ''cv''y' g'' Eki \ ct''Ncng''O \ kpg''kp''Ecpcf \ c0''}$

P gv'ucrgu''qh''yi g''eqcn''dwukpguu''cpf ''qyi gt''dwukpguugu''y gtg''Ø42: 08''dkmkqp''*wr ''5709' ''{{gct''}qp''{{gct+."tghrgevkpi "c"uki pkhkecpv'kpetgcug''kp''eqcn''r tkegu''hqt''yi g'''eqcn''dwukpguu0'' "Qr gtcvkpi "kpeqo g'y cu'Ø5; 08''dkmkqp.''wr ''5: 90) ' ''htqo ''yi g''r tgxkqwu''hkuecn''{{gct0'}

Cu''c"tguwn."'vj g"vqvcn'pgv'ucrgu"qh"vj g"tguqwtegu"ugi o gpv."wr "4905' "{gct"qp"{gct."y cu" Ø4:; 06"dkmlqp"y kj "qr gtcvkpi "kpeqo g"qh"Ø880 "dkmlqp."wr "52405' "htqo "vj g"r tgxkqwu"hkuecn'

...

{ gct0'

]Qyj gt 'ugi o gpvu_"

Co qpi "qyj gt" ugi o gpvu." cu" hqt" yj g" grgevtqpke" o cvgtkcnı" dwukpguu." yj g" ci tkewnwtcn' dkqvgej pqrqi {"dwukpguu."yj g"i cu"dwukpguu."cpf "yj g"tgpgy cdrg"gpgti {"dwukpguu."yj g"Eqo r cp{" j cf "cej kgxgf "yj g'hqrrqy kpi <"

*Grgevtqpke"o cvgtkcni'dwukpguu+"

Kp''y g'hkgrf ''qh'QNGF ''o cvgtkcnı. ''y g'Eqo r cp{ "guvcdrkıj gf 'c'nqecn'uwdukf kct { 'kp''Uj cpi j ck' kp'tgur qpug''vq''ewuvqo gt'tgs wktgo gpwi'kp'Ej kpc''y ky 'kwi'i tgcv'o ctngv'r qvgpvkcn') "Hwtyi gto qtg." y ky ''cko u'qh'hcekrkscvkpi ''y g'f gxgmr o gpv'qh'j ki j /r gthqto cpeg'QNGF ''o cvgtkcnı. ''y g'Eqo r cp { "eqpenwf gf "c''dcuke"ci tggo gpv'hqt"c''uvtcvgi ke"cnkcpeg''y ky "DQG''Vgej pqmi { "I tqwr "Eq0"Nvf0' qh'Ej kpc0' "O gcpy j krg. ''y g'Eqo r cp { "eqpenwf gf 'c''eqqr gtcvkqp''ci tggo gpv'y ky ''Uqwy 'Mqtgcøu'' NI "Ej go ."Nvf0'hqt"r cvgpv'uj ctkpi ''kp''y g''QNGF ''o cvgtkcnı''tgrcvgf ''hkgrf0' "Vj g'Eqo r cp { "cnuq" tgcej gf "cp''ci tggo gpv'y ky ''Vqtc { "Kpf wuxtkgu. ''Kpe0'hqt''vgej pkecn'eqqr gtcvkqp''tgi ctf kpi ''QNGF'' o cvgtkcnı0'

*Ci tkewnwtcn'dkqvgej pqnqi { "dwukpguu+"

Kp''y g''hkgrf "qh''ci tkewnwtg''cpf ''i tggpkpi ''o cvgtkcnu.''y g''Eqo r cp $\{$ ''ku''y qtmkpi "qp''cevkxkkgu'' vq'' gzr cpf '' y g'' ucngu'' qh'' kwu'' dkqr guvkekf g'' vq'' cf xcpegf '' r tqf wegtuø'' i tqwr u'' y tqwi j '' kwu'' ucngu'' uwdukf kct $\{$.''Kf go kww'Ci tk'Eq0''Nvf0'

 $\label{thm:continuity:continuit$

*I cu'dwukpguu+"

Rgvtqi cu'Gpgti {'Eqtr 0''y j qug''uj ctgu''y g'Eqo r cp{''j qnf u''y tqwi j 'CncI cu''K go kuw'Iqkpv'' Xgpwtg''Nko kgf "Rctvpgtuj kr "y j kej "'y g"Eqo r cp{"lqkpvn{"guvcdrkuj gf "y ksj "CncI cu''Nvf 0'qh'' Ecpcf c."eqpvkpwgf "'vq"gpf gcxqt ''vq"gpj cpeg"gzrqtw'qh'NRI "*rks wghkgf 'r gvtqngwo 'i cu+'htqo "'y g" Hgtpf cng''vgto kpcn'*vj g"Uvcvg''qh''Y cuj kpi vqp+''qp''vj g"Y guv'Eqcuv'qh''y g"WU''vq'Icr cp''cpf "qvj gt" Cukcp''eqwpvtkgu0'

*Tgpgy cdrg"gpgti { "dwukpguu+"

Kp"yj g"hkgrf "qh"tgpgy cdrg"gpgti {"dwukpguu."yj g"Eqo r cp{"qr gtcvgu"uqrct"r qy gt"i gpgtcvkqp" hcekrkkkgu"*o gi c/uqrct"r qy gt"r repw'y kyj "yj gkt"vqvcrlr qy gt"i gpgtcvkqp"ecr cekx{"qh'37.432"nY +"kp" O qlk"Y ctf."Mkvcm(wuj w'Ekx{="J ko glk"Ekx{."J {qi q"Rtghgewtg="cpf" Ky cnk"Ekx{."Hwnwuj ko c" Rtghgewtg0" "Kp"yj g"hkgrf "qh"dkqo cuu"r qy gt"i gpgtcvkqp."Vquc"I tggp"Rqy gt"Eq0"Nvf0'y kyj "cp" qwr w'ecr cekx{"qh'8.472"mY .'72' "qh'y j qug"uj ctgu"ctg"j grf "d{"yj g"Eqo r cp{."cpf "Hwnwk"I tggp" Rqy gt"Eq0"Nvf0'y kyj "cp" qwr w'ecr cekx{"qh'9.222"mY "ercuu."32' "qh'y j qug"uj ctgu"ctg"j grf "d{"yj g"Eqo r cp{."ctg"kp"qr gtcvkqp0'" Kp"yj g"hkgrf "qh'y kpf "r qy gt"i gpgtcvkqp."yj g"Eqo r cp{"ewttgpvn{"qr gtcvgu"Hwco cvc"Y kpf "F gxgrqr o gpv'Eq0"Nvf0'y kyj "cp"qwr w'ecr cekx{"qh'73.222"mY ."62' "qh'y j qug"uj ctgu"ctg"j grf "d{"yj g"Eqo r cp{0"

...

 $Cu''c''tguww.''vqvcn'pgv'ucrgu''hqt''qvj~gt''ugi~o~gpvu.''wr~'';~0~'''\{gct''qp''\{gct.''ctg''/\!\!/28;~0~''dknkqp.''vy'',~0~'''',~0~'''',~0~'''',~0~'''',~0~'''',~0~'''',~0~'''',~0~'''',~0~''''',~0~'''',~0~'''',~0~''''',~0~''''',~0~''''',~0~''''',~0~''''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~''''',~0~'''''',~0~'''''',~0~'''''',~0~'''''',~0~''''',~0~''''',~0~''''',~0~''''',~0~''''',~0~''''',~0~''''',~0~''''',~0~''''',~0~''''',~0~''''',~0~''''',~0~''''',~0~''',~0~''',~0~''',~0~''',~0~''',~0~''',~0~''',~0~''',~0~''',~0~''',~0~''',~0~''',~0~''',~0~''',$

*kx+" Qxgtxkgy "eqpegtpkpi "hkpcpekcn"r qukkkqp<"

Uwo o ct { "qh'eqpuqrkf cvgf "dcrcpeg"uj ggv"

			*Wpkv<'lØDkmkqp+''
ıı	Н 4238"	Н 4239"	Ej cpi g"
	11 1230	11 1237	*F get gcug+"
Ewttgpv'cuugvu''	; 7; 0 "	3.445@"	- 48504"
Hzgf "cuugvu"	3.8: 30 "	3.8; 905"	- 3706"
Vqvcn'cuugvu''	4.86308"	4.; 4205"	- 49: 08"
Ewttgpv'rkcdkrkkgu''	3.36702"	3.38409"	- 3909"
P qp/ewttgpv'rkcdkrkkgu"	: 9809"	: 7308"	*4703+"
Vqvcn'rlcdkrkskgu"	4.24309"	4.236%"	*906+"
Vqvcn'pgv'cuugvu"	83; 0, "	; 270, "	- 4: 802"
Vqvcnl'nlcdkrkxkgu'cpf 'pgv'cuugvu''	4.86308"	4.; 4205"	- 49: 08"
			-

c+" Vqvcn'cuugvu"

 $Vqvcn'cuuguu'cu''qh''O\ ctej\ "53."423:\ "kpetgcugf\ "d\{"\emptyset 49:\ 08"dkmkqp"eqo\ r\ ctgf\ "y\ kyj\ "y\ g"gpf\ "qh"y\ g"r\ tgxkqwu''hkuecn''\{gct"vq"\emptyset 4.;\ 4205"dkmkqp."o\ ckpn{"f\ wg"vq"kpetgcugu"kp"\ ceeqwpw''tgegkxcdmg/vtcf\ g"cpf\ "kpxgpvqt{"cuuqekcvgf\ "y\ kyj\ "y\ g"j\ ki\ j\ gt"ko\ r\ qtv'r\ tkegu"qh''etwf\ g"qkn'cpf\ "y\ g"eqpugs\ wgpeg''y\ cv'y g"hcuv'f\ c{"qh'y}\ g"o\ qpyj\ 'hgm'qp"c'y\ ggngpf\ 0'$

d+" Vqvcn'rkcdkrkvkgu"

 $\label{eq:linear_control_con$

e+" Vqvcn'pgv'cuugwu"

Vj g"Eqo r cp{"cej kgxgf"uki pkhkecpv'ko r tqxgo gpv'kp"ku"hkpcpekcn'r qukkqp"y kj "pgv'cuugw"cu"qh'O ctej "53."423: "vqvchpi "Ø, 270 "dkmkqp."cp"kpetgcug"qh'Ø4: 802"dkmkqp" eqo r ctgf "y kj "vj g"gpf "qh'vj g"r tgxkqwu"hkuecn'{gct."tghngevkpi "c'Ø88465"dkmkqp"ewttgpv' pgv'kpeqo g"cwtkdwcdng"vq"qy pgtu"qh'vj g"r ctgpv'eqo r cp{"cu'y gm'cu'ecr kxcn'cpf "ecr kxcn' uwtr nxu'kpetgcukpi "d{'Ø7; @'dkmkqp."tgur gevkxgn{."cu'c'tguwn'qh'vj g'r wdnke'uj ctg'qhhgtkpi 0'

Eqpugs wgpvn{.''y g''gs wkv{ 'tcvkq''cu''qh'O ctej ''53.''423: 'y cu''4; Θ' .''ko r tqxkpi '908'' r qkpvu'htqo ''4408' ''cv''y g''gpf ''qh''y g''r tgxkqvu''hkuecn''{ gct0'}

*x+" Kpx guvo gpv'kp'r rcpv'cpf 'gs wkr o gpv<"

Vj g'co qwpv'qh'kpxguvo gpv'kp'r rcpv'cpf 'gs wkr o gpv'qh'vj g'I tqwr 'hqt'hkuecn'{ gct '4239'\qvcngf '' Ø7; 06''dkm'qp. ''y j kej ''y cu'r tkpekr cm{ ''wugf ''cu'hqmqy u<''

Ugi o gpv'	Rt kpekr cril kpx guvo gpv'kp''r rcpv'cpf "gs wkr o gpv'
Rgvtqrgwo "r tqf wewi"	Tgunt wewnt kpi ."o ckpvgpcpeg"cpf 'tgpgy cn'qh'hcekrk kgu'qh'vj g" tghkpgt kgu="gpj cpego gpv."o ckpvgpcpeg"cpf 'tgpgy cn'qh'ucrgu" hcekrk kgu'qh'ugt xkeg'urcvkqpu"
Rgvtqej go kecn'r tqf wewu"	Tguvt wewtkpi ." o ckpvgpcpeg" cpf " tgpgy cn' qh' r tqf wevkqp" hcekrkvkgu"
Tguqwtegu"	F gxgrqr o gpv'cpf "o clpvgpcpeg"qh'qkri'hlgrf u="o clpvgpcpeg" cpf 'tgpgy cri'qh'eqcri'r tqf wevlqp'hcekrkligu. "gve0'
Qyj gtu""	F gxgrqr o gpv' tgrcvgf "vq" grgevtqpke" o cvgtkcru" cpf "gpj cpego gpv'qh'o cpwhcewtkpi 'hcekrkkgu. 'gve0'

*xk+" Hkpcpekpi <

Vj g"I tqwr)ı"y qtmkpi "ecr kscn"tgs wktgo gpw"f gtkxg"o ckpn{"htqo "vj g"r wtej cugu"qh"tcy "o cvgtkcnı"hqt"vj g"o cpwhcewstg"qh"r tqf wevu."cpf "hnwewcvg"kp"tgur qpug"vq"etwf g"qkn"r tkegu"cpf "hqtgki p"gzej cpi g"tcvgu0' "F wtkpi "hkuecn"{gct"4239."kw"y qtmkpi "ecr kscn"kpetgcugf "f wg"vq"c"tkug" kp"qkn"r tkegu="j qy gxgt."vj g"dcncpeg"qh"uj qtv'vgto "dqttqy kpi u"f getgcugf "d{"Ø43609"dkmkqp" eqo r ctgf "y kj "vj g"gpf "qh"vj g"r tgxkqwu"hkuecn'{gct0' "Vj ku"f getgcug"y cu"f wg"vq"vj g"I tqwr øu" tgr c{o gpv'qh'r ctv'qh"vj g"uj qtv'vgto "dqttqy kpi u"qdvckpgf "hqt"vj g"ces wkukkqp"qh"Uj qy c"Uj gm' Ugnk{w"MDM0'uj ctgu"d{"crrtqrtkcvkpi "vj g"hwpf u"r tqewtgf "vj tqwi j "vj g"kuuwcpeg"qh"pgy "uj ctgu" *33; (7"dkmkqp"{gp."kuuwgf "kp"Lwn{"4239+"cpf "eqpxgtukqp"qh"vj g"tgo ckpkpi "r ctv'qh'uwej "uj qtv' vgto "dqttqy kpi u'vq'hqpi /vgto "dqttqy kpi u'cpf "dqpf u'*vj g"7vj "Ugtkgu'Wpugewtgf 'Uvtcki j v'Dqpf u=" co qwpv'qh'kuuwg<"32"dkmkqp"{gp="vgto <7"{gctu="kuuwgf" "kp"F gego dgt"4239+0'

Vj g'I tqwr 'o cf g'c'ecr kıcılıpxguvo gpv'lp'\j g'co qwpv'qh'7; (6'dkmlqp"{gp'lp'hkuecn'{gct'4239." cpf 'y kıj 'tgi ctf '\q'\j g'tgs wktgf 'hwpf u'hqt'uwej 'ecr kıcılıpxguvo gpv.'cr r tqr tkcvgf 'r ctv'qh'\j g'hwpf u'' r tqewtgf 'd{"\j g'cdqxg/o gpvlqpgf 'kuuvcpeg"qh'pgy 'uj ctgu'cpf 'kwu'qy p'hwpf u''

Cu"c"tguww."yi g"dcm:peg"qh"kpvgtguv/dgctkpi "f gdv"cv"yi g"gpf "qh"hkuecn"{gct"4239"hqt"yi g" I tqwr 'y cu'Ø; 508"dkmkqp."c"f getgcug"qh"Ø87: Ø"dkmkqp"eqo r ctgf "y kyi "yi g"gpf "qh"yi g"r tgxkqwu" hkuecn"{gct0'

*4+" Cuugui'cpf 'kpeqo gliquuk'

Kgo "	322 yj "{ gct" Crtkri3."4236"/" O ct0'53."4237"	323uv'{ gct" Cr tki3.'4237'/" O ct053.'4238"	324pf "{ gct" Crtki'3."4238"/" O ct053."4239"	325tf "{ gct " *ewtgpv"{ gct+" Cr tkri3."4239"/" O ct053."423: "
P gv'ucrgu" *o knkqp"{gp+"	6.84; .954"	5.792.424"	5.3; 2.569"	5.952.8; 2"
Qtf kpct { 'kpeqo g'*rquu+'' *o knkqp''{gp+''	*329.83: +"	*43.; 25+"	35; .; 8: "	448.538"

P gv" kpeqo g" *rquu+" cwtkdwcdrg"\q"qy pgtu"qh" yj g'r ctgpv" *o knkqp"{gp+"	*359.; 7: +"	*57.;;5+"	::.386"	384.529"
P gv" kpeqo g" *rquu+" r gt" uj ctg"" *{gp+"	*: 84072+"	*447025+"	7730; "	: 67039"
Vqven'euugvu" *o knkqp"{gp+"	4.953.223"	4.624.33: "	4.863.855"	4.; 42.487"
P gv'cuugvu" *o knkqp"{gp+"	852.5: 6"	759.882"	83; .; 54"	; 27.; 4; "
P gv'cuuguu'r gt 'uj ctg"	5.89305; "	5.34; 0, 5"	5.86; 0 5"	6.399062"
*{ gp+"				

*5+" O clqt'r ctgpv'eqo r cp{"cpf "uwdukf kctkgu<"

*k# Tgrcvkqpuj kr "y kyj "vj g"r ctgpv'eqo r cp $\{<$ "

" P qv'cr r nlecdrg0' "

 $\label{eq:continuous} \parbox{*} \parbo$

P co g"	Eer ken'	Tcvkq"qh'xqvkpi" tkij w"qh'yjg" Eqorcp{'₩ +"	O скр"dwиkpguu"
K go kuw'Vcpngt 'Eq0'Nvf 0'	Ø8.222"o knlqp"	322Œ"	Vtcpur qtvcvkqp"qh"etwf g"qkr" cpf 'r gvtqrgwo 'r tqf wew!"
Krgo kuw'TgvckdOctmgvkpi 'Eq0'' Nvf0'	Ø 2"o knkqp"	322Œ"	Ucrg"qhi'r gwqrgwo "r tqf wewi"
Kr go kuw'Uwr gtxkukpi 'Eq0'Nvf0'	Ø82"o knkqp"	322Œ"	Ucrg"qh'r gytqrgwo "r tqf wewi"
U000Gpgti { 'Eq0''Nvf0'	Ø722"o knkqp"	32202"	Ucrg"qh"r gwqrgwo "r tqf wewi"
IF GO KVUW' IP VGTP C VIQP C N'*C UIC +" RVG0NVF 0'	WU&467.378"" yiqwucpf"	322Œ"	Korqtv."gzrqtv"cpf "vtcf kpi "qh" etwfg"qkn"rgvtqrgwo"rtqf wevu." gve0'"
KF GO KVUWCRQNNQ" EQTRQTCVKQP"	WU&387"" yj qwucpf"	322@"	Korqtv" gzrqtv' cpf " ucng" qh' rgvtqngwo 'rtqf wew. "gwe0'
Kr go kuw'Wpkgej 'Eq0'Nvf 0'	Ø4.822" o knkqp"	322Œ"	O cpwbcewtg"cpf 'ucrg"qh" r rcuwe"r tqf wewi"
Kf go kuw'Rgvtqrgwo 'P qti g'CU'	PQM949.; 22" yj qwucpf"	322Œ"	Kpxguki cıkqp."gzrıqtcıkqp." f gxgnqr o gpv'cpf "ucıg"qh'qkıl' tguqwtegu"
IF GO KVUWCWUVTCNIC" TGUQWTEGURV["NVF"	C & 328.8; : " ý qw.cpf "	322Œ"	Kpxguvki cvkqp."gzrnqtcvkqp." fgxgnqrogpv'cpf"ucng"qh'eqcnu"
Kf go kuw'Ecpcf c'Tguqwtegu'' Nvf 0'	E&353.389" yj qwucpf"	322@"	Kpxguki ckqp."gzrnqtckqp." fgxgnqrogpv'cpf"ucng"qh" wtcpkwo"tguqwtegu'kp"Ecpcfc"

P co g"	Eer keri'	Tcvkq"qh"xqvkpi" tkijw"qh"vjg" Eqorcp{"* +"	O ckp''dwukpguu''
Kf go kuw'Ecpcf c'Eqtr qtcvkqp''	E&556.222" yj qwucpf"		Kpxguvki cvkqp"cpf "rtqo qvkqp"qh" i cu"cpf "tgrcvgf "dwukpguugu"kp" Ecpcfc"
UF U'Dkqvgej 'MIMI)'	Ø 32"o knkqp"	8; 19"	Rtqf wevkqp. 'ko r qtv'cpf 'ucıgu' qh'ci tlewnwtcı'ej go kecnı''

*P qvgu+"30' Vj g"\$Tcvkq"qh"xqvkpi "tki j vu"qh"vj g"Eqo r cp{ $\$ "ku"uj qy p"d{"kpenwf kpi "vj qug"j gnf "kpf ktgevn{" vj tqwi j "kwu"uwdukf kctkgu0'

40' Vj g'\$Tcvkq'qh'xqvkpi 'tki j wi'qh'vj g'Eqo r cp{\$'ku'tij qy p'd{"ecnewncvkpi 'f qy p'vq'vj g'vj ktf 'f geko cn' r neeg"cpf "vj gtgchvgt "tqwpf kpi "wr y ctf "qt "f qy py ctf "vq"vj g"pgctguv'ugeqpf "f geko cn'r neeg."cu' yj g"ecug"o c{"dg0"

*6+" Knuwgu'\q'dg'cfftguugf<"

Vj g"I tqwr "j cu" f gxgmr gf "ku" Hkhij "Eqpuqnkf cvgf "O gf kwo /vgto "O cpci go gpv' Rrcp." eqxgtkpi "y g"y tgg" { gct "r gtkqf "htqo "hkuecn' { gct "423: "y tqwi j "hkuecn' { gct "4242."cu" f guetkdgf "dgmy ."cu"y gm'cu"hqto wrcvgf "ku"o cpci go gpv'xkukqp"cpf "o cpci go gpv'i qcn'hqt '4252."y j kej "ku" dcugf "qp"mpi /vgto "gpxktqpo gpvcn'hqtgecuwu0'

*k+" Wpf gtucpf kpi 'qh'ewttgpv'eqpf kkqpu"

- c+" Vj g"Eqo r cp{øu'dwukpguu'untwewtg"f gr gpf u"j gcxkn{"hqt"gctpkpi u"qp"vj g"vj tgg" dwukpguugu"qh"r gxtqrgwo ."qkn' gzr rqtcvkqp"cpf "r tqf wevkqp."cpf "eqcn0' "Vj g" ko r qtvcpeg"qh"vj gug"dwukpguugu."y j kej "ctg"eqppgevgf "f ktgevn{"vq"qwt"uqekcn' o kuukqp"qh'gpuwtkpi "c"uvcdrg"uwr r n{"qh'gpgti {."y km'tgo ckp"wpej cpi gf "kp"vj g" hwwtg"cu'y gm0'
- d+" O gcpy j krg." vj gtg"ku"cp"kuwg"y kj "eqpvkpwkpi "qxgtf gr gpf gpeg"qp" vj gug" vj tgg" dwukpguugu "hqt" uwuvckpcdrg" i tqy vj "dgecwug" qh" wpegtvckpv ("kp" gctpkpi u"f wg" vq" hrwewckqpu "kp" tguqwteg" r tkegu "cpf" o ctrngv'eqpf kkqpu. "cpf" cruq "kp" r tqo qvkqp" qh'i mdcriy cto kpi "eqwpvgto gcuwtgu'y kj "eqpukf gtcvkqp" hqt" y g'Rctku" Ci tggo gpv "qp" erko cvg" ej cpi g+0"
- e+" Kp"cffkkqp."vjg"uqwtegu"qh"gpgti{"vjcv"ctg"kp"fgocpf"vqfc{"ctg"ejcpikpi"ykj" yjg"vkogu0" "Cu"uwej."vjgtg"ku"c"pggf"hqt"qwt"dwukpguu"uvtwewstg."yjkej"ku"uwksgf" vq"vjgug"ejcpigu0"

*kk+" O cpci go gpv'xkukqp"cpf "\cti gw'hqt"4252"

c+" O cpci go gpv'xkukqp"

Vj g"I tqwr "j cu"kf gpvkhkgf "cu"ku" xkukqp"hqt"4252."õY g"ctg"cp"kpvgtpcvkqpcn" gpgti {"eqo r cp{"y j q"etgcvgu"pgy "xcnwg"y j krg"uggnkpi "j cto qp{"y kj "y g"Gctyj ö" kp"gcej "eqwpvt {."y kj "c"hqewu"qp"Icr cp"cpf "Cukc0" "Vq"tgcnkl g"vj ku"xkukqp."y g" y km"cko "vq"vtcpuhqto "qwtugnxgu"kpvq"c"tguknkgpv"eqtr qtcvg"gpvkv{."d{"vcnkpi "qp" y g"hqmqy kpi "ej cngpi gu<"

- "Uwrrqt vkpi "vjg 'uqeken'k pht cuvt wewtg "cu"c "uwrr kgt "qh 'gpgti { "cpf "o cygtkenu"
- •" Eqpvtkdwkpi "vq"gptkej "uqekgv{"cpf"r gqr rgøu"rkxgu" yi tqwi j "hwpevkqpcn"

- o cygtkeni"
- Eqpvtkdwkpi " vq" geqpqo ke" f gxgrqr o gpv" kp" kpf kxkf wcrl' eqwpvtkgu" cpf " tgi kqpu'wukpi ''y g'\gej pqmi kgu'cpf ''gzr gt\kug''y g'j cxg''dwkn/'wr 'kp'Icr cp''
- Etgeskpi "pgy" dwukpguugu" yi tqwi j "fgxgmqr o gpv' qh" pgz v'i gpgteskqp"o cygtkeni'epf 'ugtxkegu'' "

O cpci go gpv'vcti gw'*4252+"

Y g"cko "\q"gpj cpeg"qwt "gctpkpi u"r qvgpvkcn'y j krg"\tcpuhqto kpi "qwtugnxgu"y kj "c" tguknkgpv"r qtvhqrkqô yi tqwi j "uvtwewtcm{"tghqto kpi "yi g"r gvtqrgwo ."tguqwteg." cpf "qyj gt"dwukpguugu. "i tqy kpi "qwt"dwukpguugu "kp"i tqy yj "o ctmgvu "cpf "i tqy yj " hkgrf u. "cpf "etgckpi "pgy "dwukpguugu0"

- *c+" Qr gtcvkpi "kpeqo g"*kpenwf kpi "kpeqo g"htqo "gs wkv{ "o gyj qf "chhkrkcvgu+"qh" LR[472"dkmkqp"
- *d+" Cej kgxkpi "c"uxtwewtg"kp"y j kej "vj g"vj tgg"dwukpguugu"ceeqwpv"hqt"pq"o qtg" yj cp'72' "qh'qr gtcvkpi "kpeqo g'*LR[342"dkmkqp+"
- *e+" Cej kgxkpi "c'uxtwewtg'kp"y j kej "dwukpguugu'kp'i tqy yj "o ctngxu'cpf 'i tqy yj " hkgrf u'cpf 'pgy 'dwukpguugu'ceeqwpv'hqt'cv'rgcuv'62' 'qh'qr gtckpi 'kpeqo g''

*kkk+" Hkhyj "Eqpuqnkf cygf 'O gf kwo /ygto 'O cpci go gpv'Rrcp"*H[423: /4242+"

Rtkqtkv{ "vqr keu"

- *c+" Tgcnk kpi "c"tguknkgpv"dwukpguu"r qtvhqnkq"
 - Utwewtch" tghqto u" vq" yj g" yj tgg" dwukpguugu" qh" r gvtqngwo ." qkn' gzr mtckqp"cpf 'r tqf wevkqp."cpf 'eqcn'
 - Dwukpguu'gzr cpukqp'kp'i tqy yj 'o ctmgw'cpf 'i tqy yj 'hkgnf u'
 - Etgckqp"qh"pgy "dwukpguugu"vqy ctf u"4272"
- *d+" Gpj cpekpi "kpkkcvkxgu"htqo "vj g"r gtur gevkxgu"qh"vj g"gpxktqpo gpv."uqekgv{." cpf 'i qxgtpcpeg"

d+" O cpci go gpv'vcti gw'*H[4242+"

- *c+" Qr gtcvkpi "kpeqo g" *kpenwf kpi "kpeqo g" htqo "gs vkx/{ "o gyj qf "chhkrkcvgu+"qh" LR[425"dkmkqp"
- *d+" P gv'kpeqo g''qh''LR[352''dkmkqp"
- *e+" Tgwtp"qp"gs wkx{"*TQG+"qh"o qtg"yj cp"32' "*P gv"kpeqo g1Uj ctgj qrf gtu" gs wkv{ +"
- *f +" P gv'F 1G'tcvkq, "qh'209"qt "nguu"
- "", "*õKpvgtguv/dgctkpi "f gdvö"/"õEcuj "cpf 'f gr qukuu"cpf "Uj qt√vgto "kpxguvo gpv" ugewtkklguö+1*6P gv'cuugvuö''/'6P qpeqpvtqmkpi 'kpvgtguvuö+"

Ecuj /hrqy "cmqecskqp"

Y g"cko "vq"ectghwm{ "ugngev"kpxguvo gpvu"hqt"qwt"hwwtg"i tqy yj "cpf "ugewtg"htgg" ecuj "hrqy u"kp"yj g"co qwpv"qh"LR[3: 2"dkmkqp"*5/{gct"vqvcn+."cpf "r tqeggf "vq" kpetgcug'tgwtpu'\q'uj ctgj qrf gtu'cpf 'ko r tqxg'hkpcpekcn'uvtwewtg0'

f +" Kpx guvo gpv'uvt cvgi kgu"

Vqvcn' lpxguvo gpvc' IR[5; 2" dkmlqp" *5/{gct" vqvcnc' uvtcvgi le" lpxguvo gpvu" qh' IR[482"dkmlqp"cpf "o clpvgpcpeg'lpxguvo gpvu'qh'IR[352"dkmlqp+" Qh''y g''uvtcvgi le''lpxguvo gpvu. "IR[382"dkmlqp"y km'dg"cmqecvgf "vq"lpxguvlpi "lp" i tqy y "cpf "etgcvlpi "pgy "dwulpguugu."cpf "IR[322"dkmlqp"y km'dg"cmqecvgf "vq" uvtgpi y gplpi "y g''dwulpguu'hqwpf cvlqp0'

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Y g" kpvgpf" vq" gpj cpeg" tgwtpu" vq" uj ctgj qrf gtu" kp" uvci gu." tghrgevkpi " vj g" eqpf kkkqpu"qh"gctpkpi u"cpf "htgg"ecuj "hrqy "cpf "dcugf "qp"c"r qrke { "qh"uvcdrg" f kxkf gpf uO'

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Cnj qwi j ''j g'f getgcug'lp''o gf kwo /''vq''nqpi /vgto ''f go cpf 'hqt'r gvtqrgwo ''r tqf wew'lp''j g'' f qo guvle''o ctmgv'lku'lpgxkcdrg''f wg''vq''f kuugo kpcvlqp''qh''grgevt ke''cwvqo qdkrgu''cpf ''r nwi / kp''j {dtkf ''xgj kergu''*RJ Xu+:''cu''y gm''cu''f wg''vq''y g''f gxgrqr o gpv'lp''gpgti { "eqpugtxcvlqp" yej pqmi kgu." uvgcf { "i tqy yj "kp" f go cpf "hqt" gpgti { "ku" gzr gevgf "qxgtugcu" kp" yj g'' hqtguggcdrg'hwwtg.''r ctvlewrctn{ ''kp''go gti kpi ''Cukcp''eqwpvtkgu0'

*kk+" Ur gekhe 'kuuwgu'hqt 'gcej 'ugi o gpv'

Vj g''ur gekhle ''kuuwgu''hqt ''gcej ''ugi o gpv''wpf gt ''vj g''cdqxg/o gpvkqpgf ''Hkhnj ''Eqpuqnkf cvgf '' O gf kwo /vgto ''O cpci go gpv''Rrcp''ctg''cu''gzr rckpgf ''kp''vj g''hqmqy kpi 0'

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e+" Tguqwtegu'ugi o gpv"

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Kp"yj g"i gqyj gto cn'dwukpguu. "kp"cf f kukqp"vq"yj g"o ckpvgpcpeg"qh'uvcdng"qr gtcvkqp" qh" Kt go kuw" Qkc" I gqyj gto cn" yj g" Eqo r cp{"y km" gzco kpg ko r ngo gpv" pgy "r tqlgewu" kp" yj g" Q{cuw" tgi kqp" qh" Cnkxc" Rtghgewtg. "Co go cuwf cng" tgi kqp" qh" J qnmckf q. "gveHO'

f+" Qyj gt 'ugi o gpwu"

Kp" vj g" grgevtqpke" o cvgtkcnu" dwukpguu." vj g" Eqo r cp{"cko u" vq" uvtgpi vj gp" ku" tgrcvkqpuj kr u" y kvj "ng{"Mqtgcp IEj kpgug" f kur rc{" o cpwhcewtgtu." tgkphqteg" ku" r tqr tkgvct {" f gxgmr o gpv" ecr cdkrkvkgu" cpf " gzr cpf " uvtcvgi ke" cmkcpegu" y kvj " o cvgtkcnu" o cpwhcewtgtu. "cpf "ecr wtg" kpetgcukpi "QNGF" f go cpf "d{"gpj cpekpi" r tqf wevkqp" ecr cekv{0'

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Kp"yj g"i cu"dwukpguu."yj g"Eqorcp{"y km'eqpf wev'uwf kgu"qp"eqoogtekchk cukqp" qh"yj g"dwukpguu."yj tqwi j "J koglk"Pcwtcn'I cu"Rqy gt"I gpgtcukqp"Eq0"Nvf0'cpf" y km'o cng"ghhqtwu'vq'hwtyj gt"gzrcpf "gzrqtv'cpf "ucngu'vq'Cukcp"eqwpvtkgu"qh'NRI "htqo"Pqtyj 'Cogtkec0'

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*kx+" Eqpukf gtc.kqp"qh"dwukpguu'kpvgi tc.kqp"y kyj "Uj qy c'Uj gm"Ugmk{ w"M0M0\"

Vj g'Eqo r cp{"gpvgtgf "kpvq"c"Uj ctg'Rwtej cug"Ci tggo gpv'qp"Lwn{"52."4237"vq"ces wktg" Uj qy c'Uj gml'Ugnk{w'MOMO'uj ctgu'htqo "vj g'luwdukf kct{"eqo r cpkgu'qh'Tq{cn'F wej 'Uj gml' r ne"fTF Uö+."cpf 'j cu'ukpeg"dggp"r tqeggf kpi 'y kyj "f kuewuukqpu'hqt"dwukpguu'kpvgi tcvkqp" y kyj "Uj qy c"Uj gml'Ugnk{w'MOMO'

Vj g"Eqo r cp{"j cu" tgegkxgf "c"pqvkeg" htqo "vj g"Icr cp" Hckt" Vtcf g"Eqo o kuukqp" qp" F gego dgt"3; ."4238."vq"vj g"ghhgev"vj cv"vj g"Icr cp" Hckt "Vtcf g"Eqo o kuukqp"vj kmi'pqv"kuuwg" c"egcug"cpf "f gukuv"qtf gt."r tqxkf gf "vj cv"tgo gf kcn'o gcuwtgu"r tqr qugf "d{"vj g"Eqo r cp{" cpf " Uj qy c" Uj gmi Ugmk{ w' MOMO ctg" vcngp" cpf " vj g" Eqo r cp{" j cu" eqo r ngvgf " vj g" ces wkukkqp"qh"339.983.422"uj ctgu"qh"Uj qy c"Uj gmi*5305' "qh"vj g"xqvkpi "tki j vu+"htqo " TF UO'

Kp" cf f kklqp." yi g" Eqo r cp {"uki pgf "cp" ci tggo gpv" qp" O c {"; ."4239" tgi ctf kpi "yi g" hqto cvkqp"qh"cp"cmkcpeg"y kyi "Uj qy c"Ugmk{ w'MOMO'q"gpj cpeg"cpf "r tqo qvg"yi g"dwukpguu" eqmcdqtcvkqp0'

Vj g'uwduvcpeg''qh''yj g''ci tggo gpv'ku''cu'hqmqy u0'

c0' Qdlgevkxgu"

"

Y g"y km'hqto "vj g"cmkcpeg"cu"gs wcn'r ctvpgtu."cpf "gzvgpukxgn("f ggr gp"qwt"dwukpguu" eqmcdqtcvkqp"y j krg'tguvctvkpi 'qt'ceegngtcvkpi 'vj g'r tqeguugu'hqt'vj g'dwukpguu'kpvgi tcvkqp." cpf "o cng"vj g"o quv'wug"qh'qwt"vko g'r tkqt"vq"cej kgxgo gpv'qh"vj g"dwukpguu'kpvgi tcvkqp" cpf 'tgcnk g'u{pgti kgu'f wtkpi 'vj cv'r gtkqf 'kp'qtf gt'\q'hwtyi gt'gpj cpeg'vj g'eqtr qtcvg'xcnwg" qh'vj g'eqo r cpkgu0'

- d0' P co g'qh'y g'cmlcpeg<'Dtki j vgt'Gpgti {'Cmlcpeg'
- e0' F gvckru'qh'vj g''cmkcpeg''
 - *c+" Tgcnk cvkqp" qh" u{pgti kgu" htqo " yi g" kpvgi tcvkqp" kp" yi g" f qo guvke" r gvtqngwo " dwukpguu"
 - " Qr who k cwkqp"qh'etwf g'qkri'r wtej cug"cpf "vtcpur qtv."cu"y gm'cu"qr who k cwkqp" qh'r tqf wewkqp"r rcppkpi "
 - " Kpvgtej cpi g"qh"hkpkuj gf "r tqf wewu"cpf "kpvgto gf kcvg"r tqf wewu."kpenwf kpi "cv" yj g"uej gf wrgf "uj wv"f qy p"o ckpvgpcpeg"r gtkqf "qh"c"tghkpgt {."vq"qr vko kt g" r tqf wevkqp"
 - " Kortqxgo gpv'qh'ghhlekgpe{"qh'nqi kurkeu'pgvy qtm'*rcpf 'cpf 'o ctkpg+"
 - " Tgf wevkqp"qh"tghkpgt { "equvu"
 - "Ko r ngo gpvcvkqp"qh"dguv"r tcevkegu"vq"ucxg"gpgti {"cpf "ko r tqxg"tghkpgt {" o cti kp"
 - " Tgf wevkqp"qh"r tqewtgo gpv"equvu"d { "gpj cpekpi "lqkpv"r tqewtgo gpv"

__

- *d+" U{pgti {'vcti gv' Y g"y km'uxtkxg"vq'tgcnk g"c"vqvcn'qh'52"dkmkqp"{gp"qt"o qtg"qh'cppwcn'u{pgti kgu" hqt"dqy "eqo r cpkgu'htqo "423; 0'
- *e+" Crki po gpv'qh'dwukpguu''uvtcvgi kgu''kp"qxgtrcrrkpi "dwukpguu''ctgcu''dgwy ggp"yj g" eqo r cpkgu"
- *f+" Eqpulf gtcvkqp"qh"uvtcvgi kgu"hqt"yi g"cmkcpeg"i tqwr "cpf "yi g"kpvgi tcvgf "pgy "eqo r cp{"
- *g+" Rtqo qvkqp"qh'j cto qpk cvkqp"dgw ggp"r gtuqppgn'qh'vj g"eqo r cpkgu"
- *h+" " F gxgmr o gpv'qh'pgy 'ugtxlegu'htqo 'vj g'r gtur gevlxg''qh'ewnqo gtu"
- *i +" Hwt yi gt "r tqo qvkqp"qh'uqekcn'eqpvtkdwkqp"cevkxkkgu"
- *j +" Rtqo qvlqp"qh"lpkvlcvlxgu"vq"tgcrk| g"c"nqy/ectdqp"uqelgv("

Cu'ugv'qw'cdqxg. 'kp''qtfgt'vq''o cmg'uwduvcpvkcn'dtgcmjtqwiju'cu'c'ngcfkpi 'eqorcp{'kp'' yi g''kpf wuxt{"y kj "cp"qwuvcpfkpi "eqorgvkkxgpguu"cpf"c"pgy "gpgti{"eqorcp{"qh'' Lcrcpgug"qtkikp."yi g"Eqorcp{"kpvgpfu"vq"ceegngtcvg"kuu"ghqtwu"hqt"yi g"dwukpguu"eqmcdqtcvkqp"y kyj "Ujqyc"Ugnk{w'MOMO"cpf"y kn''eqpvkpwg"y kyj "fkuewuukqpu"hqt"dwukpguu'kpvgitcvkqp0'

Hwty gt." yj g"Eqo r cp{"cpf" Uj qy c"Ugkm{ w"MDMO'eqo o gpegf" r gtuqpcn' kpvgtcevkqpu" dgw ggp" yj gkt 'r gtuqppgn'f kxkukqpu' 'q' r tqo qvg' o wwcn' wpf gtuvcpf kpi 'kp'P qxgo dgt' 4239." cpf "gz vgpf gf "yj gug' r gtuqpcn' kpvgtcevkqpu' 'q' yj g"qhhkegt "rgxgn' kp'Cr tkn' 423: 0' " Kp' vgto u" qh' qti cpk cvkqp." yj g"qhhkegu "qh' egt vckp" f kxkukqpu "qh" gcej "eqo r cp{"o gti gf "kp" O ctej " 423: 0' " Vj tqwi j " uwej " r tqeguugu." y g" ctg" ugewtgn{" r tqo qvkpi " j cto qpk cvkqp" qh' qti cpk cvkqpu' cpf 'r gtuqppgn') "

" The information regarding future forecasts above are based on information available as of the date of publication of this document. The actual operating results may differ from the forecasts due to various factors in the future.

*7+" O clqt 'dwukpguugu' *cu'qh'O ctej '53.'423: +<"

"

Ugi o gpv'	O clqt"dwukpguugu"
Rgvtqrgwo 'r tqf wevu''	Korqtv.'tghkpgogpv.'rtqfwevkqp'cpf'ucng'qh'etwfg'qkn'rgvtqngwo"rtqfwevu'cpf'nwdtkecpvu.''cpf'vtcpurqtvcvkqp''cpf'uvqtcig'tgncvkpi"yigtgvq="ucng"qh'ugtxkeg'uvcvkqp''rtqfwevu''
Rgvtqej go kecn'r tqf wewi	Rtqf wewqp"cpf 'ucrg'qh'r gwqej go kecn'r tqf wew!'
Tguqwtegu"	Kpxguvki cvkqp." gzrnqtcvkqp." f gxgnqro gpv' cpf "ucng" qh' qkn' tguqwtegu."i gqyj gto cn'tguqwtegu."eqcn'cpf "wtcpkwo"
Qyj gtu""	Korqtv." rwtej cug" cpf "ucng" qh" i cu="rtqf wevkqp" cpf "ucng" qh" gngevtqpke" o cvgtkcn="f guki p." eqpuvtwevkqp." o ckpvgpcpeg" cpf "o cpci go gpv" qh" r gvtqngwo /tgncvgf "hcekrkvkgu="kpuwtcpeg" ucngu" dwukpguu="etgf kv"ectf" ugtxkegu="rtqf wevkqp." korqtv"cpf "ucng" qh" citkewnwtch" ej go kecn="tgpgy cdng" gpgti {"dwukpguu="qkn" cpf" gpgti {"uqnwkqpu"dwukpguu"

"

*8+" O clqt "dwukpguu"qhhkegu"cpf "r rcpw"*cu"qh'O ctej "53."423: +<"

*k+" Vj g'Eqo r cp{<"

Ecvgi qt {"	Qhhegu"
J gcf "qhhkeg"	3/3. 'O ctwpqwej k'5/ej qo g. 'Ej k{qf c/mw. 'Vqm{q"
Tghkpgtkgu"	J qmmckf q'*Vqo cmqo ck⊹'Ckej K*Ej kxc+"
Eqo r mgz gu"	Ej kdc'*Kej kj ctc+:"Vqnw{co c'*Uj wpcp+"
Dtcpej 'Qhhleg''	J qmmckf q" Hktuv." Ugeqpf." Vj ktf" *Ucrrqtq+." Vqj qmw' Hktuv' *Ugpf ck+." Vqj qmw' Ugeqpf "*O qtkqmc+." Mcpvq" Hktuv." Ugeqpf ." Vj ktf "*Ej wq/mw." Vqm(q+." Mkc/Mcpvq" Hktuv." Ugeqpf "*Uckco c+." Pki cvc" *Pki cvc+." O cvuwo qvq" *O cvuwo qvq+." Vqmck' Hktuv." Ugeqpf "*Pci q{c+." J qmwtkmw' *Mcpc cy c+." Mcpuck' Hktuv' *M{qvq+." Mcpuck' Ugeqpf "*Qucmc+." Mcpuck' Vj ktf "*Mqdg+." Ej wi qmw' Hktuv' *J ktquj ko c+." Ej wi qmw' Ugeqpf "*Qmc{co c+." Uj kmqmw' *Vcmco cvuw+." M{wuj w' Hktuv." Ugeqpf "*Hwmwqmc+." M{wuj w'Vj ktf "*Mci quj ko c+."
Kof wuxt kerl Hwgrl Uergu" Qhhkeg"	J qmmckf q'*Ucrrqtq+:"J ki cuj k'P kj qp'*Ej wq/mw."Vqm(q+:"P cmc" P kj qp" *P ci q {c+:" Ej wi qmwlUj knqmw' *J ktquj ko c+:" M{ wuj w' *Hwmvqnc+"
Qxgtugcu'qhhlegu''	Okffrg'Gcw'*Cdw'Fjcdk+:"Jcpqk'*Xkgvpco+"
Nedqtevqtkgu"	Cf xcpeg" Vgej pqmi {" Tgugctej " Ncdqtcvqtkgu" *Uqf gi cwtc+." Nwdtkecpvu" Tgugctej " Ncdqtcvqt{" *Kej kj ctc+." Rgthqto cpeg" O cvgtkcni'Ncdqtcvqtkgu'*Kej kj ctc+."

*P qvg+" Vj g'Eqo r cp { "o cf g'\j g'hqmqy kpi "uvtwewtcn'ej cpi gu<"

*c+" Vj g"Ej kdc"Eqo r ngz" y cu" pgy n{" guvcdrkuj gf " d{" kpvgi tcvkpi " vj g"Ej kdc" Tghkpgt {"cpf "vj g"Ej kdc"Rgvtqej go kecn'Rrcpv'qp"Qevqdgt"3."42390' "

*d+" Vj g'dtcpej ''qhhlegu'cpf 'lpf wwtkcnlhwgn'ucngu'qhhlegu'y gtg'enqugf ''qp'Cr tkd3." 423: "cpf ''y g'hqmqy kpi ''gki j v'dtcpej gu'y gtg''pgy n(''guvcdrkuj gf <'J qmmckf q'' Dtcpej '*Ucr r qtq+''Vqj qmwDtcpej '*Ugpf ck+'Mcpvq'Hktuv'Dtcpej '*Ej wq/mw'' Vqm(q+'Mcpvq'Ugeqpf 'Dtcpej '*Uckco c+'Ej wdw'Dtcpej ''*P ci q {c+'Mcpuck'' Dtcpej '' *Qucnc+'' Ej wi qmwlUj kmqmw'' Dtcpej '' *J ktquj ko c+'' cpf '' M{ wuj w'' Dtcpej ''*Hwnwqnc+0''

*kk+" Uwdukf kctkgu<"

P co g"	Cfftguu"
Kgo kuw'Vcpngt'Eq0'Nvf0'	Ej k{qf c/mw."Vqm{q"
Kigo kuw'TgvckiOctngvkpi 'Eq0''Nvf0'	Ej wq/mw."Vqm{q"
Krgo kuw'Uwrgtxkukpi 'Eq0'Nvf0'	Ej k{qf c/mw."Vqm{q"
U 10 Gpgti { 'Eq0' Nvf 0'	Uj kplwmv/mw."Vqm{q"
KFGOKVUWKPVGTPCVKQPCN"∜CUKC+" RVG0NVF0'	Ukpi cr qt g"

KF GO KVUWCRQNNQ'EQTRQTCVKQP"	Ucetco gpvq.''WUUC0'
Kr go kuw'Wpkgej 'Eq0'Nvf0'	O kpcvq/mw.''Vqm{q''
Kr go kuw'Rgvtqrgwo 'P qti g'CU'	N{ucngt."Pqty c{"
Kgo kuw'Cwuntcrkc'Tguqwtegu''Rv{ ''Nvf''	Dtkudepg. 'Cwinterke''
K go kuw'Ecpcf c'Tguqwtegu'Nvf 0'	Ecn ct{."Ecpcf c"
Kt go kuw'Ecpcf c'Eqtr qtckqp"	Ecn ct{."Ecpcf c"
UF U'Dkqvgej 'MOMO'	Ej wq/nw."Vqm{q"

*9+" Go r nq { ggu' "cu' qh' O ctej '53. '423: +<"

Ugi o gpv'	P wo dgt "qh"go r m { ggu"		Ej cpi g'htqo ''yj g''gpf ''qh''yj g' r tgxkqwu'hkuecn'{gct''		
Rgvtqrgwo 'r tqf wew'	"	8.39: ""	*5.469+"	"	- "4; 2"
Rgvtqej go kecn'r tqf wew''	"	3.586"	*379+"	"	/"37: "
Tguqwtegu"	"	899"	*5; +"	"	- "8"
Qyj gtu" "	"	958"	*47; +"	"	/"544"
Vqvcn'	"	: .; 77"	*5.924+"	"	/'3: 6"

*P qvgu+"30' Vj g"pwo dgt"qh"go r rq{ggu"tgrtgugpvu"yj g"pwo dgt"qh"yj qug"cewcm{"cv" y qtmz"yj g"pwo dgt"qh"vgo r qtct{"y qtmgtu"ku"uj qy p"kp"yj g"r ctgpyj gugu" ugr ctcvgn{0'

40' Vj g''pwo dgt''qh''go r mq { ggu'f get gcugf 'd { '544'htqo ''y g''gpf ''qh''y g''r tgxkqwu'' hkuecn'' { gct.'f wg''q.'co qpi ''qy gt 'hcevqtu.''y g''ucrg''qh''qxgtugcu''eqpuqnkf cvgf '' uwdukf kctkgu''kp''y g''ugi o gpv'ŏQy gtuöO'' ''

*kk+" Gorm{ggu'qh'yjg'Eqorcp{<"

	Ej cpi g'htqo 'vj g'gpf '' qh'vj g'r tgxkqwu'hkuecn' {gct''		Cxgtci g''ngpi vj ''qh'' ugtxleg''
5.; 48'*886+"	/'97"	64"{ lu"cpf "6" o lu"	42"{ lu'cpf '3'o "

*P qvg+" Vj g'pwo dgt ''qh''go r m{ ggu''tgr tgugpvu''y g''pwo dgt ''qh''y qug''cewcm{ "cv'y qtm<"y g'' pwo dgt ''qh''yo r qtct { "y qtngtu''ku''uj qy p''kp''y g''r ctgpyj gugu''ugr ctcvgn{ 0'

*: +" O clqt''rgpf gtu''*cu''qh''O ctej ''53.''423: +<"

Ngpf gt"	F gdv'r c{cdrg"
Uwo kaqo q'O kuwk'Depmlpi "Eqtrqtevlqp"	Ø, 3.846"o kmkgp"
Vj g'Depm'qh''Vqm{q/O kuwdkuj k'WHL''Nvf 0'	Ø86.; 6: "o kmkgp"
Uwo kaqo q'O kuwk'Vtwuv'Depm'Nko kgf "	Ø83.9; 9"o kmkqp"

F gxgrqr o gpv'Dcpm'qh'Icr cp'Kpe0'	Ø79.; 22"o kmkqp"
Ler ep 'Qkn'I eu'epf 'O gwnu'P evkqpen'Eqtr qtevkqp''	Ø76.;;;"o knkqp"
Ok wj q'Depm'Nvf 0'	Ø55.434"o kmkqp"
Ler ep 'Depm'hqt 'Kovgtpevkqpen'Eqqr gtevkqp"	Ø48.4: 7"o kmkqp"
O kuwdkuj k'WHL'Vtwuv'epf 'Depmkpi 'Eqtrqtevkqp''	Ø47.; 78"o kmkqp"

^{*}P qvg+" Vj g"Dcpm'qh"Vqm(q/O kuwdkıj k"WHL"Nvf 0'ej cpi gf "ku"vtcf g"pco g"vq"O WHI " Dcpm'Nvf 0'cu'qh'Cr tkrl'3."423:0'

 $\begin{tabular}{ll} *, +" & Qvj gt"lo r qtvcpv'o cwgtu"eqpegtplpi "vj g"ewttgpv'uvcvg"qh'vj g"I tqwr<" \\ " & " \\ \end{tabular}$

" P qv'cr r nlecdng0'

40' Ewttgpv'incvg'qh'vj g'Eqo rcp{''

*3+" Uj ctgu'*cu'qh'O ctej '53."423: +<"

*k+" Vqvcn'pwo dgt "qh''cwj qt k gf "vj ctgu<" 658.222.222 "vj ctgu"

*kk+" Vqvcn'pwo dgt "qh'kuuwgf "uj ctgu<" 42: .222.222 "uj ctgu"

*kkk≓ P wo dgt "qh'uj ctgj qnf gtu<" 39.: 54 "r gtuqpu"

*kx+" O clqt''uj ctgj qrf gtu'*vqr ''32+<"

P co g"	P wo dgt"qh'uj ctgu" *yj qwwcpf 'uj ctgu+"	Uj ctgj qrf kpi 'tcvkq'' * +"
P knuj q'Mqucp'M0M0'	49.33; "	35@6"
Kf go kuw'Ewnwtg"cpf "Y grhctg"Hqwpf cwlqp"	34.5; 4"	70,8"
Kigo kuw'O wugwo "qh'Ctwi"Hqwpfcvkqp"	: .222"	50 7"
Lcr cp"Vt wuvgg"Ugt xlegu"Dcpm"Nvf ()*Vt wuv'ceeqwpv+"	8.; 42"	5055"
Vj g'O curgt "Vt wur'Dcpniqh'I.cr cp. 'Nvf 0*Vt wur'ceeqwpv+"	8.9; 8"	5049"
Vj g'Dcpm'qh''Vqm(q/O kuwdkıj k'WHL''Nvf 0'	7.364"	4069"
Uwo kaqo q'O kuwk'Depmkpi 'Eqtr qtevkqp''	7.364"	4069"
Uwo kaqo q'O kuwk'Vtwuv'Dcpm'Nko kgf "	7.364"	4069"
O wpcmeve'I qfq'I ckuj c"	6.; 96"	405; "
Kr go kww'Gorm {gg"Uqemjqnfgtu'Eqookwgg"	6.; 5: "	4059"

^{*}P qvgu+'30' Vj g''uj ctgj qrf kpi "tcvkqu"ctg"ecrewrcvgf "d{"gzenwf kpi "vj g''uj ctgu''qh''vtgcuwt{"uvqem''qh''vj g'' Eqo r cp{'*69.839''uj ctgu+0'

 $^*4+"$ Uvqem'ces wkukskqp'tki j vu. "gve0t"

" P qv'cr r nlecdng0'

..

[&]quot; 40' Vj g'Dcpm'qh'Vqm(q/O kuwdkıj k'WHL'Nvf 0'ej cpi gf 'kuı'vtcf g'pco g'vq'O WHI 'Dcpm'Nvf 0'cu' qh'Cr tkri3.'423: 0'

Eqtrqtcvg'qhhlegtu<' *5+"

$F \, \textbf{k} \, \textbf{gevqtu"cpf"Ucwvqt} \, \textbf{\{"Cwf kqtu" \c"qh"Octej "53."423: +<"}$ *k+"

Rqukkqp"	Pco g"	F wkgu'cpf 'o clqt'eqpewttgpv'qhhleg'
Tgrtgugpvcvkxg"Fktgevqt"(" Ej kgh"Gzgewkxg"Qhhkegt"	Vencuj K"Vuwnkqne"	"
Gzgewkxg"Xkeg"Rtgukfgpv" cpf "Fktgevqt"	Vencuj KO euwuj ke"	Kp"ej cti g"qh"yej pqrqi {"fkkukqp" *invdtkecpvu."hwpevkqpcn"o cvgtkcnu." kpvgmgewcn"r tqr gtv{ ltgugctej +."ej go kecnu" dwukpguu"cpf "Xkgvpco "r tqlgev."cpf " eqpewttgpvn{"ugtxgu"cu"Fkxkukqp"O cpci gt." Uchgv{"cpf "Gpxktqpo gpvcn"Rtqvgevkqp" Fkxkukqp."cpf "Fkxkukqp"O cpci gt."S wcnkv{" Cuuwtcpeg"Fkxkukqp"
Gzgewkxg"Xkeg"Rtgukfgpv" cpf "Fktgevqt"	Uj wplej k'Mksq"	Kp"ej cti g"qh"hwgn"dwukpguu"f kxkukqp"*ucrgu." pgy "gpgti kgulmi kukeu."qxgtugculuwrrn{" cpf "f go cpf."cpf "o cpwhcewtkpi "cpf " yej pqmi {+"
O cpci kpi 'F ktgevqt"	Uwuwo w'P kdw{c"	Kp"ej cti g"qh"eqtr qtcvg"r mppkpi ."cpf" r wdrke"tgm kqpu"cpf "EUT"*Eqtr qtcvg" Rmppkpi "F gr ctvo gpv"cpf "Rwdrke" T gm kqpu"cpf "EUT"Qhhkeg+"cpf" tgur qpukdmg'hqt"yj g'tguqwtegu'f kxkukqp"
Fkgevqt"	Mc wq'O ctw{co c"	Kp"ej cti g"qh'uwr gtxkukpi "ej go kecnu" dwukpguu'**Rgytqej go kecn'Dwukpguu" F gr ctvo gpv. "Cf xcpegf "O cygtkcnu" (Rgthqto cpeg'Ej go kecnu "F gr ctvo gpv." Kf go kuw "Wpkgej." cpf "Rtko g"Rqn (o gt+")
Fkgevqt"	Vquj kenk"Uci kuj ko c"	Kp"ej cti g"qh"ceeqwpvkpi ."i gpgtcn"chhcktu." kphqto cvkqp"u{uvgo u"*Vtgcuwt{" F grctvo gpv."I gpgtcn"Chhcktu"F grctvo gpv." Kphqto cvkqp"U{uvgo "F grctvo gpv."cpf" Kt go kuw"Kpuwtcpeg"Ugtxkeg+."cpf" eqpewttgpvn{"ugtxgu"cu"Ej ckto cp"qh" Eqo r ncpeg"("Tkum"O cpci go gpv" Eqo o kvvgg"
Fkgevqt"	Mk{quj kJ qpo c"	Kp"ej cti g"qh'uwr gtxkukpi "qxgtugculuwr r n{" cpf "ttef kpi "Kpvgi tevgf "Uwr n{" "Vtef kpi " F gr ctvo gpv."Qxgtugcu'Rgvtqngwo "("I cu" F gr ctvo gpv."Kf go kuw"Vcpngt."Kf go kuw" Kpvgtpcvkqpcn'*Cukc+."Vqo cvqj "Qkn'Uvqtci g." cpf "J qnmckf q"Iqkpv'Qkn'Uvqemr krkpi +"cpf " eqpewttgpvn{"ugtxgu"cu'I gpgtcn'Ocpci gt" qh'Qxgtugcu'Rgvtqngwo "("I cu'F gr ctvo gpv'
Fktgevqt"	Gtk'[qmqvc"	Rtqhguuqt."Hcewn ("qh"Dwukpguu"cpf " Eqo o gteg."Mgkq"Wpkxgtukv (" Fktgevqt."VQNKEqtrqtcvkqp"
Fktgevqt"	T{quwng'Kq"	Cwqtpg{"cv'rcy" *VO KCuuqekcvgu+" Fktgevqt.'Icr cp"Dcugdcm'O ctngvkpi 'MIMO'

Rqukkqp"	Pco g"	F włgu'cpf 'o clqt'eqpewttgpv'qhheg''
Fktgevqt"	Vengq'Mkmrey e"	Fktgevqt.'Okuwdkuj k'Ej go kecn'J qnfkpi u'' Eqtrqtcvkqp'' Rtqhguuqt.'I tcfwcvg'Uej qqn'qh'Kppqxcvkqp'' Uwfkgu.'Vqm(q'Wpkxgtukv{''qh'Uekgpeg''
Fktgevqt"	O cengp kg'Enwi uvqp"	Fktgevqt."Moogfc"Ugkmo"Eq0"Nvf0' Rtqhguuqt."Mycpugk"Icmvkp"Wpkxgtukv{" Fktgevqt."Ucrrqtq"Jqnfkpiu"Nkokxgf"
Hwm/wko g'Uvcwwqt{" Cwf kqt"	Vencpqtk'Mwpk(euw'	
Hwm'sko g'Uscwwqt { " Cwf kqt "	Ucneg'J ktcpq"	и
Ucwwqt { 'Cwf kqt"	Vcki k'Kq"	Egt while 'Rwdn'e 'Ceeqwpvcpv'*Kq"Vcki k' Qhhleg+" Uvcwwqt{'Cwfkqt."VKU'Kpe0' Fktgevqt."Okuwdkuj k'Ej go kecn'J qnfkpi u'' Eqtrqtcvkqp"
Uwwqt { 'Cwf kqt"	Uj qkej ktq" P ky c{co c"	Cwqtpg{ "cv'ncy "*Cucj k'Ncy "Qhhleg+"

- *Pqvgu+" 30' Fktgevqtu" O u0' Gtk" [qmqvc." O t0' T {quwng" Kq." O t0' Vcngq" Mkmmcy c." cpf " O t0' O cengp| kg"Enxi uvqp"ctg"Qwulf g"Fktgevqtu0'
 - 40' Uscwwqt {" Cwf kqtu" O guutu0' Vcki k" Kq." cpf " Uj qkej ktq" P ky c {co c" ctg" Qwulf g" Uscwwqt {"Cwf kqtu0'
 - 50' Ucwwqt {"Cwf kqt" O t0' Ucmcg" J ktcpq." y j q" j cu" j cf " gzr gtkgpeg" kp" ceeqwpvkpi " r tcevkegu"cu"c"O cpci gt"qh"Ceeqwpvkpi "Ugevkqp"cpf "F gr wx{"I gpgtcn"O cpci gt"qh"Ceeqwpvkpi 'F gr ct vo gpv'qh'vj g'Eqo r cp{."j cu'eqpukf gtcdrg'hpqy rgf i g'qh'hkpcpekpi " cpf "ceeqwpvkpi 0'
 - 60' Ucwwqt {"Cwf kqt"O t0'Vcki k'Kq."y j q"j cu"j cf "gzr gtkgpeg"cu"c"egt khkgf "r wdrke" ceeqwpvcpv'cpf "c"wpkxgtukx{"r tqhguuqt."j cu"eqpukf gtcdrg"mpqy rgf i g"qh"hkpcpekpi "cpf "ceeqwpvkpi 0'
 - 70' Fktgevqt"Ot0'Vcngq"Mknmcyc."yjq"ycu"c"wpkxgtukx{"rtqhguuqt"cv'vjg"Itcfwcyg"Uejqqn'qh'Kppqxcvkqp"Uwfkgu."Vqnfq"Wpkxgtukx{"qh'Uekgpeg."dgecog"c"wpkxgtukx{"rtqhguuqt"cv'vjg'Itcfwcyg"Uejqqn'qh'Ocpcigogpv."Vqmfq"Wpkxgtukx{"qh'Uekgpeg"cu"qh'Crtkri3."423: "fwg'vq'vjg'tgqticpk;cvkqp"qh'vjg"Itcfwcyg"Uejqqn0'
 - 80' Fktgevqtu" O u0' Gtk' [qmqvc." O t0' T {quwng" Kq." O t0' Vcngq" Mkmrey c." cpf " O t0' O cengp| kg" Enxi uvqp" cpf " Uvcwvqt { " C wf kqtu" O guutu0' Vcki k' Kq" cpf " Uj qkej ktq" P ky c {co c"ctg"kpf gr gpf gpv'qhhkegtu"y j q"j cxg"dggp"tgi kuvgtgf "kp"ceeqtf cpeg"y kj " y g"twrgu"qh'y g"Vqm(q"Uvqem'Gzej cpi g0'

90' F ktgevqtu'y j q'tguki pgf 'f wtkpi ''y g'hkuecn'{ gct 'wpf gt 'tgxkgy ''ctg''cu''dgmy <'

Pco g"	F cvg"qh" tguki pcvkqp"	I tqwpf "qh" tguki pcvkqp"	Rqukskqp. 'f wkgu. 'cpf 'korqt cpv' eqpewttgpv'qhhleg''cv'vj g'vkog''qh' tgukipcvkqp''
F ckwng''Ugnk'	O ctej "4: ."423: "	Tguki pgf "	Gzgewkxg"Xkeg"Rtgukfgpv'cpf" Tgrtgugpvcvkxg"Fktgevqt"*Cuukuvcpv' vq"Tgrtgugpvcvkxg"Fktgevqt"cpf" Ej kgh'Gzgewkxg"Qhhkegt+"

..

: 0' Ej cpi gu'kp'\j g'r qukkqpu'qh'\j g'F ktgevqtu'hqmqy kpi '\j g'gpf 'qh'\j g'hkuecn'{ gct '\wpf gt'' tgxkgy ''ctg''cu''dgmqy <"

Pco g"	Rqukkqp"dghqtg" yj g"ej cpi g"	Rqukkqp"chygt"yj g" ej cpi g"	F cvg"qh'vj g"ej cpi g"
Vencuj k"Vuwnkqne"	Tgrtgugpvvkxg" Fktgevqt"cpf"Ejkgh" Gzgewkxg"Qhhlegt"	Ejcktocp"cpf" Tgrtgugpvcvkxg" Fktgevqt"	Cr tki'3."423: "
Uj wpkej k'Mkq"	Gzgewkxg"Xkeg" Rtgukf gpv'cpf "F ktgevqt"	Tgrtgugpvcvkxg" Fktgevqt"cpf"Ejkgh" Gzgewkxg"Qhhkegt"	Cr tkd3."423: "
Vencuj k'O evuvuj kwe"	Gzgewkxg"Xkeg" Rtgukf gpv'cpf "F ktgevqt"	Gzgewkxg"Xkeg" Rtgukf gpv'cpf " Tgr tgugpvcvkxg" Fkgevqt"	Crtkii3."423: "

 $> \!\! Tgh\!gtgpeg@Eqtrqtcvg'Iqxgtpcpeg'Gh\!qtvu''$

 $Ch y t'' c' f' k pi'' y q'' o q t g'' Q wuk f g' F' k t ge v q t u'' k p'' 4239. '' y g'' D q c t f'' q h' F' k t ge v q t u'' q h' y g'' E q o r c p { 'ku'' e q o r q u g f'' q h' g'' g y g'' R t g e v q t u'' v p f g t'' y g'' R t g e v q t u'' c p f'' k g e v q t u'' c p f'' c p f$

O qtgqxgt."kp"4239."yj g"P qo kpckqp"cpf "Tgo wpgtckqp"Cf xkuqt {"Eqo o kwgg"y cu"guvcdrkuj gf "cu"cp" cf xkuqt {"dqf {"hqt"yj g"Dqctf "qh'F ktgevqtu0' "Vj g"eqo o kwgg"ku"eqo r qugf "qh'wy q"kpf gr gpf gpv'Qwukf g" F ktgevqtu"cpf "qpg"kpf gr gpf gpv'Qwukf g"Uvcwwqt {"Cwf kvqt0" Vj g"kpf gr gpf gpv'Qwukf g"F ktgevqt"ugtxgu" cu"vj g"ej ckto cp"qh"vj g"eqo o kwgg."y j q."kp"vj g"ugrgevkqp"qh"ecpf kf cvgu"hqt"c"pgy "Rtgukf gpv'cpf "vj g" ugrgevkqp"qh'ecpf kf cvgu"hqt"c"pgy "Rtgukf gpv'cpf "vj g" ugrgevkqp"qh'ecpf kf cvgu"hqt"F ktgevqtu"cpf "Uvcwwqt {"Cwf kvqtu"r tqr qugf "vq"vj g"Qtf kpct {"I gpgtcn'O ggvkpi" qh'Uj ctgj qrf gtu."eqpf wewlo wnkrcvgtcn'gxcnwcvkqpu'cpf "tgr qtw'vq"yj g"Dqctf "qh'F ktgevqtu0' "Hwtvj gt."y kyj " tgur gev'vq"yj g"f gvgto kpcvkqp"qh'vj g'tgo wpgtcvkqp"qh'vj g"F ktgevqtu."yj g"eqo o kwgg"o cngu'ghhqtw'vq "gpuwtg" yj g'r tqeguu'ku'vtcpur ctgpv'd {'tgr qtvkpi "vq"yj g"eqpuwncvkqpu'qh'vj g"Dqctf "qh'F ktgevqtu'dcugf "qp"qdlgevkxg" f cvc0'

*kk+" Vqvcn'co qwpv'qh'tgo wpgtcvkqp."gve0'r c{cdng"vq"eqtrqtcvg"qhhkegtu<"

*c+" Vqvcn'co qwpv'qh'tgo wpgtcvkqp."gve0'd{"ecvgi qtkgu'qh'qhhkegtu."yj g'\qvcn'pwo dgt"qh" tgo wpgtcvkqp."gve0'd{"v{r gu'yj gtgqh'cpf "yj g'pwo dgt"qh'qhhkegtu"gnki kdng'\j gtghqt<"

Ecvgi qt{"	P wo dgt"	Vqv:n'co qwpv'qh' '' tgo wpgtcwqp.''gve0'
Fktgevqt" *Qwukfg"Fktgevqt+"	37" *6+"	Ø89; "o knkqp" *Ø57"o knkqp+"
Ucwwqt { "C wf kqt " *Qwukf g"Ucwwqt { "C wf kqt+"	7" *5+"	Ø99"o knkqp" *Ø44"o knkqp+"
Vqvcri' *Qwukf g"F ktgevqt "cpf "Qwukf g" Uvcwwqt { "Cwf kqt+"	42" *9 ₊ "	Ø979"o knkqp" *Ø79"o knkqp+"

*Pqvg+" Tgo wpgtcvkqp"qh"vjg"Fktgevqtu"cpf"Uvcwwqt{"Cwfkqtu"kpenwfgu"dcuke"tgo wpgtcvkqp"dwv"fqgu"pqv"kpenwfg"cp{"uvqeni'qrvkqpu."dqpwugu."ucnctkgu"cpf"ycigu"qh"gornq{ggu"qt"tgvktgogpv'itcvvkkkgu0'

*d+" Eqpvgpvu"cpf 'vj g"o gyj qf "qh"f gvgto kpcvkqp."qh"vj g"r qnke { "qp"vj g"f gvgto kpcvkqp"qh" yj g" co qwpv" qh" tgo wpgtcvkqp." gve0' qh" qhhkegtu" cpf "vj g" o gyj qf "qh" ecnewncvkqp" yj gtgqh

Y kj " tgi ctf " vq" tgo wpgtcvkqp." gve0' qh" qhhkegtu." yj g" o czko wo " co qwpv" qh" tgo wpgtcvkqp"qh"F ktgevqtu"y cu"f gvgto kpgf "vq"dg"Ø8.422"o knhqp"r gt"cppwo "cpf" yj cv"qh" Uvcwvqt {"Cwf kqtu" y cu" f gvgto kpgf " vq" dg" Ø842" o knhqp"r gt"cppwo ." tgur gevkxgn{."d{ 'tguqnwkqp"qh"yj g", 3uv'Qtf kpct {"I gpgtcn'O ggvkpi "qh"Uj ctgj qnf gtu" j gnf "qp" Lwpg"49."42280' " Vj g"tgo wpgtcvkqp."gve0'qh"kpf kxkf wcn'F ktgevqtu"ctg" f gvgto kpgf "d{" vj g"Dqctf "qh"F ktgevqtu"kp"ceeqtf cpeg"y kyj "c"tgr qtv"htqo " vj g" P qo kpcvkqp"cpf "T go wpgtcvkqp"Cf xkuqt {"Eqo o kvgg."y j kej "uj cm'dg"eqo r tkugf "qh"kpf gr gpf gpv'Qwukf g"F ktgevqtu"cpf "kpf gr gpf gpv'Qwukf g"Uvcwvqt {"Cwf kqtu." cpf "vj g"tgo wpgtcvkqp."gve0'qh"kpf kxkf wcn'Uvcwvqt {"Cwf kqtu"ctg"f gvgto kpgf "wr qp" eqpuwncvkqp"co qpi "vj g"Uvcwvqt {"Cwf kqtu0'

*kkk+" O cwgtu'eqpegtpkpi ''qwukf g''qhhkegtu<''

*c+" Qwulf g"qhhegtu)"o clqt"eqpewttgpv"qhhegu"qh"gzgewkxg"f ktgevqtu."gve0'hqt"qvj gt" eqtr qtcvkqpu'cpf 'vj g'Eqo r cp{}u'tgrcvkqpuj kr u'y kyj 'uwej 'qvj gt 'eqtr qtcvkqpu<"

P qv'cr r nlecdng0'

"

"

*d+" Qwukf g'qhhlegtu)'o clqt'eqpewttgpv'qhhlegu'qh'qwukf g'qhhlegu'qh'qvj gt'eqtrqtcvkqpu' cpf 'vj g'Eqorcp{)u'tgrcvkqpuj kru'y kj 'uwej 'qvj gt'eqtrqtcvkqpu<"

Fktgevqt'Ou0Gtk'[qmqvc'ku'ugtxkpi 'cu'cp'Qwwkfg'Fktgevqt'hqt'VQNKEqtrqtcvkqp0' ''Vjg'Eqorcp{'jcu'pq'urgekcn'tgncvkqpujkr'ykj'jg'eqtrqtcvkqp0'

Fktgevqt"Ot0"T {quwng"Kq"ku"ugtxkpi "cu"cp"Qwukfg"Fktgevqt"hqt"Icrcp"Dcugdcm' Octngvkpi 'MMO' "Vjg'Eqorcp{'jcu'pq'urgekcntgncvkqpujkr'ykj'yjg'eqtrqtcvkqp0' $F\ ktgevqt"O\ t0"Vcmgq"Mkmmcy\ c"ku"ugtxkpi\ "cu"cp"Qwukf\ g"F\ ktgevqt"hqt"O\ kuwdkuj\ k'\\ Ej\ go\ kecn'J\ qrf\ kpi\ u"Eqtr\ qtcvkqp0'\ "\ Vj\ g"Eqo\ r\ cp{"j\ cu"pq"ur\ gekcn'tgrcvkqpuj\ kr\ "\ y\ kj\ "'j\ g"eqtr\ qtcvkqp0'$

 $F\ ktgevqt''O\ t0O\ cemgp|\ kg''Enwi\ uvqp''ku''ugtxkpi\ ''cu''cp''Qwukf\ g'F\ ktgevqt''hqt''Mco\ gf\ c''\ Ugknc''Eq0''Nvf\ 0'cpf''Ucr\ r\ qtq''J\ qnf\ kpi\ u''Nko\ kxgf\ 0'''\ Vj\ g''Eqo\ r\ cp\{''j\ cu''pq''ur\ gekcn''\ tgncvkqpuj\ kr''y\ kxj''y\ gug''eqtr\ qtcvkqpu0'$

Ucwwqt { 'Cwf kqt 'O t0Vcki k'Kq'ku'ugtxkpi 'cu'cp'Qwukf g'Ucwwqt { 'Cwf kqt'hqt 'VKU'' Kpe0'cpf ''cu''cp''Qwukf g'F ktgevqt'hqt''O kuwdkuj k'Ej go kecn'J qnf kpi u''Eqtrqtcvkqp0' ''Vj g'Eqorcp{'j cu''pq''ur gekcn'tgncvkqpuj kr''y kyj ''vj gug''eqtrqtcvkqpu0'

*e+" Qwukf g"qhhkegtu)" mkpuj kr "y kj " y g"gzgewkxgu. "gve0'qh" yj g"Eqo r cp{"qt"qyj gt" dwukpguugu'j cxkpi 'ur gekhke't grcvkqpuj kr u'y kj " y g'Eqo r cp{<"

P qv'cr r nlecdng0'

*f+" O clqt "cevkxkkgu"f wtkpi 'vj g"hkuecn"{ gct "wpf gt 'tgxkgy <

Cwgpf cpeg"cv'yj g"o ggwpi u"qh'yj g"Dqctf "qh'Fktgevqtu"cpf "vj g"Dqctf "qh'Ucwwqt { "Cwfkqtu<"

"	"	Dqctf 'ql	n'Fktgevqtu"	Dqctf "qh"Ucwwqt{" Cwf kqtu"	
		O ggvkpi u" T cvg"qh" cwgpf gf " cwgpf cpeg"		O ggvkpi u" cwgpf gf "	Tcvg''qh'' cwgpf cpeg''
Fktgevqt"	Gtk"[qmqvc"	38138"	322' "	/"	/"
Fktgevqt"	T{quwng'Kq''	38138"	322' "	/"	/"
Fktgevqt"	Vengq'Mkmrey e"	34134"	322' "	/"	/"
Flat gevqt"	O cengp kg" Envi uvqp"	33134"	; 4' "	/"	/"
Uvcwwqt{"Cwfkqt"	Vскі К 'К q''	38138"	322' "	3: 13: "	322' "
Ucwwqt{'Cwf kqt"	Uj qkej ktq" Pky c{co c"	38138"	322' "	3: 13: "	322' "

 $F \ kt gevqt"O \ u0'Gtk"[\ qmqvc."rt kpekr cm{"Intqo "vj g"uvcpf rqkpv"qh"ceeqwpvkpi "cu"c" wpkx gtukx{" rt qhguuqt." }F \ kt gevqt" O t0' T {quwng" Kq." rt kpekr cm{" ht qo " c" ngi cn" uvcpf rqkpv"cu"cp"cwqtpg{"cv"rcy ."F kt gevqt"O t0'Vcngq"Mkmrcy c."rt kpekr cm{" Intqo " vj g"uvcpf rqkpv"qh"c"ur gekcrkuv"kp"vj g"vj gqt{"qh"gpgti {"kpf wuxt{"cu"c"wpkx gtukx{" rt qhguuqt."cpf "F kt gevqt"O t0'O cengp| kg"Enxi uvqp."rt kpekr cm{" Intqo " vj g"i mqdcn" uvcpf rqkpv"tgi ctf kpi "vj g"qx gtcm'dwukpguugu"y kvj "dtqcf "gzr gt kgpeg"cu"c"f kr mo cv" cpf "c"wpkx gtukx{" rt qhguuqt."j cx g"t gur gevkx gn{" gzr tguugf " vj gkt"qr kpkqpu"cv" vj g" o ggvkpi u"qh"vj g"Dqctf "qh"F kt gevqt u"cpf "rt qx kf gf "cf xkeg"cpf "t geqo o gpf cvkqpu" hqt "ugewtkpi "vj g"rt qr gt pguu"qh"f gekulqp/o cnlipi "d{" vj g"Dqctf "qh"F kt gevqt u"c"$

Ucwwqt {"Cwf kqt"Ot0'Vcki k'Kq."rtkpekrcm{"htqo "yi g"uvcpf rqkpv"qh"ceeqwpvkpi" y kyi "dtqcf "gzr gtkgpeg"cu"c"egt vkhkgf "r wdrke"ceeqwpvcpv"cpf "c"wpkxgtukv{"rtqhguuqt" cpf "Uvcwwqt {"Cwf kqt"Ot0'Uj qkej ktq"Pky c{coc."rtkpekrcm{"htqo "c" rgi cn' uvcpf rqkpv"cu"cp"cwqtpg{"cv"hcy."j cxg"tgur gevkxgn{"gzrtguugf" yj gkt "qrkpkqpu"cv"yj g"

"

o ggvkpi u"qh" yi g"Dqctf "qh"F ktgevqtu"cpf "yi g"Dqctf "qh"Ucwwqt { "Cwf kqtu"cpf " r tqxkf gf "cf xkeg"cpf "tgeqo o gpf cvkqpu"hqt"ugewtkpi "vj g"r tqr gtpguu"qh"f gekukqp/ o cmkpi 'd{'\yi g'Dqctf 'qh\F ktge\qtu0'

** 11

"

*g+" Qwrkpg"qh"yj g"eqpygpv"qh"hcdkrkv{ "rko kxcvkqp"ci tggo gpvu<"

Kp"ceeqtf cpeg'y ky 'Ctvkerg'649. 'r ctci tcrj '3'qh'y g'Eqo r cpkgu'Cev'qh'Icrcp. 'y g' Eqo r cp{"j cu"gpvgtgf "kpvq"cp"ci tggo gpv"y kj "gcej "Qwulf g"F ktgevqt"cpf "gcej " Qwulf g"Ucwyqt { "Cwf kqt" \q"ho k\"y g"hcdkrk\{ 'hqt"cp { "f co ci g"cu"r tqxkf gf "hqt" kp" Ctvkeng"645. "r ctci tcr j "3"qh'vj g'uckf "cev0" "Vj g"o czko wo "nkcdkrkv{ "co qwpv'wpf gt" uwej "ci tggo gpv'ku"cp"co qwpv'cu'r tqxkf gf "hqt"kp"ncy u"qt"qtf kpcpegu0"

*6+"

Ceeqwpv'cwf kqtu<

*k+'' P co gu'qh'y g'ceeqwpv'cwf kqtu<'

F grqkvg"Vqvej g"Vqj o cvuv"NNE"

*kk+"

Co qwpv'qh'tgo wpgtcvkqp. "gve0r c { cdrg'\q'\j g'ceeqwpv'cwf kqtu'hqt'\j g'hkuecn'{gct'\wpf gt" tgxkgy <

n	Co qwpv'qh'tgo wpgtcvkqp."gve0'
Co qwpv" qh" tgo wpgtcwqp." gve0' r c{cdrg" vq" yj g" ceeqwpv" cwf kqtu"hqt"yj g"hkuecn'{gct"wpf gt"tgxkgy <"	Ø889"o knkqp"
Vqvcn" co qwpv" qh" o qpg{" cpf " qyj gt" r tqr tkgvct {" dgpghku" r c{cdrg"vq"yj g"ceeqwpv"cwf kqtu"d{"yj g"Eqo r cp{"cpf "ku" uwdukf kctkguz"	Ø486"o kmkgp"

*P qygu+" 30' Vj g"co qwpv'qh'tgo wpgtcykqp."gve0'r c{cdrg"vq"yj g"ceeqwpv'cwf kqtu"hqt"cwf ku'wpf gt" yj g'Eqo r cpkgu'Cev'qh'Lcr cp"cpf "yj g"co qwpv'qh'tgo wpgtcvkqp. "gve0rc{cdrg'hqt"cwf ku" wpf gt 'vj g'Hkpcpekcn'Kpuxtwo gpwl'cpf 'Gzej cpi g'Cev'qh'Lcr cp'ctg'pqv'ugr ctcvgf 'kp'vj g'' cwf k/ci tggo gpv'dgwy ggp'y g'Eqo r cp{ 'cpf 'y g'ceeqwpv'cwf kqtu0' " J gpeg. 'y g'cdqxg" co qwpv"qh"tgo wpgtcvkqp."gve0'rc{cdrg"vq"yjg"ceeqwpv"cwfkxqtu"hqt"yjg"hkuecn"{gct" wpf gt 'tgxkgy 'kpenwf gu'dqyj 'co qwpw0'

40' Vj g"vqvcn'co qwpv'qh'o qpg{"cpf "qvj gt"r tqr tkgvct { "dgpghku"r c { cdrg"vq"vj g"ceeqwpv' cwfkqtu"d{"vjg"Eqorcp{"cpf"kvu"uwdukfkctkgu"kpenwfgu"tgowpgtcvkqp"hqt"ugtxkegu" *pqp/cwf kkpi "ugtxkegu+:"y j kej "ctg"pqv"eqxgtgf "d{"Ctvkerg"4."r ctci tcr j "3"qh"vj g" Egt \khkgf "Rvdrke"Ceeqwpvcpv'Cev'qh'Lcr cp. "gpvt wuvgf "vq"F grqkvg"Vqwej g"Vqj o cvuw" NNE0'

50' Co qpi "yj g'ko r qt vcpv'uwdukf kctkgu"qh'yj g'Eqo r cp{."yj g"qxgtugcu'uwdukf kctkgu"y gtg" cwf kgf "d{"c"egt \khlgf "r wdrle"ceeqwp\cpv'qt "cwf k\hlto "\hto "\hpen\f kpi "\j qug"y j q"j cxg"cp" gs wkxcrgpv'egt wkhecwkqp"kp"c"hqtgki p"eqwpvt {+"qyj gt"yj cp"yj g"Eqorcp{øu"ceeqwpv' cwf kvqtu0'

*kk+" Tgcuqpu'hqt'\j g'Dqctf 'qh'U\cwxqt { 'C wf kqtu'\q'eqpugpv'\q'\j g'tgo wpgtc\qp.'gve0\qh'\j g'' ceeqwpv'cwf kqtu<'

"

Vj g"Dqctf "qh"Ucwwqt { "Cwf kqtu"qdvckpgf "pgeguuct { "o cvgtkcnı"cpf "tgegkxgf "tgr qtwl" htqo "yi g"tgrgxcpv"f kxkukqpu"qh"yi g"Eqo r cp { "cpf "yi g"ceeqwpv"cwf kxqtu. "cpf "eqphto gf " cpf "xgtkhkgf" yi g"eqpygpv'qh" yi g"cwf kv'r rcp"qh" yi g"ceeqwpv'cwf kqtu." yi g"uvcwuu"qh" yi g"gzgewkqp"qh" yi gkt "ceeqwpv'cwf kkpi "f wkgu. "yi g"dcuku"hqt "ecrewrcykqp"qh" yi g'tgo wpgtcykqp" guxko cyg." gwe0' "Cu" c" tguwxw." yi g"Dqctf" qh" Uvcwwqt { "Cwf kqtu" f gygto kpgf" yi cv' yi g"tgo wpgtcykqp." gwe0' qh" yi g"ceeqwpv' cwf kqtu" y cu" crrtqrtkcyg" cpf "eqpugpygf" yi gtgyq"r wtuwcpv'yq'Ctykeng"5;;."rctci tcrj "3"qh" yi g"Eqorcpkgu" Cev'qh"Lcrcp0'

*kx+" Eqpvgpv'qh'pqp/cwf kxkpi 'ugtxkegu<"

Vj g''Eqo r cp{"j cu''r ckf "vj g''ceeqwpv''cwf kqtu''tgo wpgtcvkqp''hqt''ugtxkegu''*pqp/cwf kdpi "ugtxkegu+"kpenwf kpi "vj g''r tgr ctcvkqp"qh''eqo hqtv''rgwgtu."pqv''eqxgtgf "d{"Ctvkerg"4."rctci tcr j ''3''qh''y g''Egtvkhkgf ''Rwdrke''Ceeqwpvcpv'Cev''qh''Lcr cp0'

x+'' Rqnke { 'qp' y g'f gvgto kpcvkqp' qh'f kuo kuucn'qt' pqp/tgcr r qkpvo gpv'qh' y g'ceeqwpv'cwf kqtu<''

Kp'ij g'gxgpv'ij cv'ij gtg'ctkugu'cp{'r tqdrgo 'y kij 'ij g'r gthqto cpeg'd{'ij g'ceeqwpv'cwf kqtu'' qh'ij gkt 'f wkgu''qt 'qvj gty kug''y g'Dqctf ''qh'Ucwwqt{''Cwf kqtu''eqpukf gtu''kk'pgeguuct{.''kv'' uj cm''cng''c''r tqegf wtg''vq''f kuo kuu''qt''pqv''vq''tgcr r qkpv''y g''ceeqwpv''cwf kqtu''r wtuwcpv''vq'' y g'Eqo r cpkgu''Cev'qh''Icr cp0'

*7+" Ranke{ "ap" 'y g"f gwgto kpc wap "ah"f kunt kdwwkap "ah"t gwclogf "gct plopi u. "gwe0."

Vj g" Dqctf" qh" F ktgevqtu" qh" yj g" Eqo r cp{" eqpukf gtu" yj g" tgwtp" qh" r tqhku" vq" ku" uj ctgj qnf gtu"cu"qpg"qh"yj g"o quv'ko r qtvcpv'o cpci go gpv'kuuwgu0' "Vj g"Eqo r cp{"y kni" eqpvkpwg"vq"r c{"f kxkf gpf u"qp"c"eqpuvcpv'dcuku"chvgt"vcmkpi "kpvq"f wg"eqpukf gtcvkqp" uvtcvgi ke"kpxguvo gpvu"vq"gpj cpeg"gzkuvkpi "dwukpguugu"cpf "f gxgmqr "hwwttg"dwukpguu" qr gtcvkqpu." yj g" ko r tqxgo gpv' qh" eqtr qtcvg" hkpcpekcn" uvtwewttg" cpf "dcncpeg" y kyj "dwukpguu"r gthqto cpegu0' "Y kyj "tgur gev'vq"yj g"r c{o gpv'qh'yj g"{gct/gpf "f kxkf gpf u"hqt" yj g"hkuecn'{gct"gpf gf "O ctej "53."423: .''yj g"Eqo r cp{"j cu'f gekf gf "vq"r c{'\%62"r gt "uj ctg0' "Cu'c"tguwnv."cppwcn'f kxkf gpf u'hqt"yj g'hkuecn'{gct"y kni'dg'\%2"r gt "uj ctg0'

 $\label{thm:condition} Hqt''y g'hkuecn'' {\it gct'gpf kpi''O ctej''53.''423; .''y g'Eqorcp {\it 'r rcpu''q' r c {\it 'cppwcn'f kxkf gpf u'' qh'\%22''r gt''uj ctg''d {\it 'kpetgcukpi''y g''cppwcn'f kxkf gpf''coqwpv''d {\it ''\%42''r gt''uj ctg'' u'' ctg'''$

Vj g"Eqo r cp{"y km'eqo o gpeg"cevkxkkgu"wpf gt"yj g"Hkhyj "Eqpuqnkf cvgf "O gf kwo /vgto "O cpci go gpv'Rrcp"hqt"yj g"yj tgg/{gct"r gtkqf "uvctvkpi "kp"yj g"423: "hkuecn'{gct0' "Wpf gt" yj g" Rrcp." y g" kpvgpf " vq" gpj cpeg" tgwwtpu" vq" uj ctgj qnf gtu" kp" uvci gu." tghrgevkpi " yj g" eqpf kkkqpu'qh'gctpkpi u'cpf "htgg"ecuj "hrqy "cpf "dcugf "qp"c"r qnke{"qh'uvcdng"f kxkf gpf u0'

*8+" U{uvgo u"vq"ugewtg"vjg"rtqrgtpguu"qh"dwulpguu"cevkxkklgu"*uq/ecmgf"\$lpvgtpcn'eqpvtqn' u{uvgo u\$+'cpf 'vjg'uwo o ct{"qh'vjg'uvcwu"qh'vjg'qrgtcvkqp"qh'vjg'u{uvgo u<"

]U{uvgo u'vq'ugewtg'vjg'rtqrgtpguu'qh'dwukpguu'cevkxkkkgu'*uq/ecngf'\$kpvgtpcn'eqpvtqn'u{uvgou\$+_"

 $Y \; kj \; "tgi \; ctf \; "vq" dcuke" r \; qrkekgu" qp" kpvgtpcn" eqpvtqn" u \{uvgo \; u. \; "vj \; g" Dqctf \; "qh" F ktgevqtu" j \; cu" \; cf \; qr \; vgf \; "tguqnwkqpu" cu" f guetkdgf \; "dgrqy \; . \; "hqt "vj \; g" u \{uvgo \; u" vq" ugewtg" vj \; g" r \; tqr \; gtpguu" qh" \; dwukpguu" cevkx kkkgu0'$

Kp"cffkkqp."yj g"Dqctf"qh"Fktgevqtu"ej gemu"y j gyj gt"yj g"kpvgtpcn"eqpvtqn"u{uvgo u"j cxg" r tqr gtn{"dggp"guvcdnkuj gf "cpf "qr gtcvgf" cpf "tgxkugu"yj go "vq"o cng"yj go "o qtg"ghgevkxg0"

..

- *k#" U{uvgo u'vq'ugewtg''y g''gzgewkqp''d{''y g'Fktgevqtu''cpf''gormq{ggu''qh''y g'Eqorcp{''cpf'' ku''uwdukfkctkgu''qh''y gkt''fwkgu''vq''eqorm{''y ky ''ncy u''qt''qtfkpcpegu''cpf''y g''Ctvkengu''qh'' Kpeqtrqtcvkqp<"
 - *c+" Vj g"Dqctf "qh"Fktgevqtu"qh"vj g"Eqorcp{"uj cm"rwtuvcpv"vq"vj g"Tgi wrcvkqpu"qh" vj g" Dqctf "qh" Fktgevqtu." f gvgto kpg" korqtvcpv" o cvvgtu" cpf "uvvrgtxkug" vj g" gzgewkqp"qh"dwukpguu0'
 - *d+" Rwtuwcpv' vq" yi g"Eqo r nkcpeg"Tgi wrcvkqpu." yi g"Eqo r cp{"uj cm' guvcdnkuj "cp" Qr gtcvkqpcn' Tkum' O cpci go gpv' cpf "Eqo r nkcpeg" Eqo o kwgg" vq" r tqo qvg" eqo r nkcpeg''cevkxkkgu''hqt"yi g'Eqo r cp{"cpf 'kwu'uwdukf kctkgu0'
 - *e+" Vj g"Eqo r cp{"uj cm'o cng"wug"qh"yj g"Eqo r nkcpeg"J cpf dqqm'yj cv'ugwu"cevkqp" i wkf gnkpgu"qp"eqo r nkcpeg"y kyj "ncy "vq"tckug"cy ctgpguu"qh'eqo r nkcpeg0'
 - *f+" Vj g'Eqo r cp{"uj cm'guvcdrkuj ."cpf "cmqy "vj g"go r m{ggu"qh''vj g'Eqo r cp{"cpf" ku'uwdukf kctkgu'kp''cpf "qwukf g'Icr cp''vq''o cmg''wug''qh 'eqo r nkcpeg''eqpvcev'qh'hkegu" y kij kp''cpf "qwukf g''qh''vj g'Eqo r cp{"vq"j gm "uqnxg"s wguvkqpu''cpf 'r tqdngo u'y kij "tgi ctf" vq" eqo r nkcpeg" cpf "vq" r tqo r vn{"kf gpwh{."tgewh{"cpf"r tgxgpv''cp{"r tqdngo u'0'}
 - *g+" Vj g''Kpvgtpcn'C wf kv''Qhhkeg''uj cm'eqpf wev'cwf ku''vq''xgtkh{ ''yj g''crrtqrtkcvgpguu''qh'' dwukpguu'' cevkxkkgu''cpf ''yj g'' uvcvg''qh'' gz gewkqp''qh''dwukpguu''r wtuwcpv''vq'' yj g'' kpvgtpcn't wrgu''cv'gcej ''dwukpguu''f kxkukqp''qh''yj g''Eqorcp{ ''cpf ''ku''uwdukf kctkgu0'
- *kk+" U{uvgo u'eqpegtpkpi 'uvqtci g'cpf 'o cpci go gpv'qh'kphqto cvkqp"qp"\j g"gzgewkqp"d{'\j g" Fktgevqtu'qh'\j g'Eqo r cp{'qh'\j gkt'f wkgu<"
 - Kohqto cvkqp"qp"yi g"gzgewkqp"d{"yi g"Fktgevqtu"qh"yi gkt"f wkgu"uj cm'dg"uvqtgf"cpf" o cpci gf"r wtuwcpv"vq"yi g"Tgi wrcvkqpu"qh"yi g"Dqctf"qh"Fktgevqtu."yi g"Fqewo gpv" J cpfrkpi "Tgi wrcvkqpu."yi g"Ektewrct"Fgekukqp"Fqewo gpv"J cpfrkpi "Tgi wrcvkqpu"cpf" qyi gt'kpvgtpcn'twgu0'
- *kkk+" Tgi wcvkqpu"eqpegtpkpi "o cpci go gpv'qh"gzr quwtg"vq"vj g"tkum'qh"vj g"Eqo r cp{" cpf "ku"uwdukf kctkgu"cpf "qvj gt"u{uvgo u<"
 - *c+" Vj g'Eqo r cp{'luj cm'guvcdrkuj 'cp'Gpvgtr tkug'Tkum'O cpci go gpv'Eqo o kwgg'y kj " y g'Rt gukf gpv'cevkpi "cu''y g'Eqo o kwgg'Ej ckt''y j gt g''kuuwgu''kpenwf kpi "r qvgpvkcn' o cpci go gpv'tkumu''ct g''f kuewuugf "vq"tgur qpf "vq"tkumu''d { "r tqlgevkpi "ej cpi gu''kp" y g''gpxktqpo gpv'cpf ''y gkt'ko r cev0'
 - *d+" Rwtuwcpv'vq"vj g"Tkum'O cpci go gpv'Tgi wrcvkqpu."vj g"Eqo r cp{"uj cm'guvcdrkuj " cp'Qr gtcvkqpcrlTkum'O cpci go gpv'cpf "Eqo r rkcpeg"Eqo o kwgg"vq"r tqo qvg"tkum' o cpci go gpv'cevkxkkgu0'
 - *e+" Rwtuwcpv'' vq'' yi g''O cpwcn'' hqt''O gcuwtgu'' wr qp'' Qwdtgcm''qh''Etkugu'' cpf ''qyi gt'' kpvgtpcn''twrgu.''yi g''Eqorcp{''uj cm''vcng''o gcuwtgu''r tqor vn{''cpf ''r tqr gtn{''wr qp'' yi g''qwdtgcm'qh''cp{''ugtkqwu''etkuku''vq''yi g''Eqorcp{''qt''cp{''qh''kwu''uwdukf kctkgu0''
 - *f+" Vj g"Eqo r cp{"uj cm"kpurkwwg"c"Dwukpguu"Eqprkpvkx{"Rrcp"*DER+"hqt"o gcuwtgu"

ci ckpuv''cp"gr kegpvtcn''gctyj s wcng"kp"yj g"Vqm{q"o gvtqr qrkxcp"ctgc."o gcuwtgu" ci ckpuv'' c" pgy " v{r g" qh" kphrwgp| c." gve0" cpf " gzgtv'' i tqwr/y kf g" ghlqtvu" vq" ko r rgo gpv."o ckpvckp''cpf "o cpci g''yj g''DER0'

,,

- *g+" Gcej "dwukpguu"f kxkukqp"uj cm "r wtuwcpv'vq"vj g"Ugrh/O cpci go gpv'Tgi wrcvkqpu." kpur gev'tkumu"vq"dwukpguu"d { "wukpi "vj g"xqnwpvct { "kpur gevkqp"nkuv."gve0'
- *h+" Vj g"Kpvgtpcn'C wf kv'Qhhkeg"uj cm "r wtuwcpv'vq"vj g"Kpvgtpcn'Eqpvtqn'T gi wrcvkqpu." eqpf wev'cwf kuu'vq'xgtkh{ 'vj g'uvcvg'qh't kun'o cpci go gpv'd { 'gcej 'dwukpguu'f kxkukqp0'

*kx+" Kpvgtpcn'eqpvtqn'qxgt'hkpcpekcn'tgrqtvkpi <"

- *c+" Rwtuwcpv'\q"yj g"Tgi wrc\kqpu"qh"Kpvgtpcn"Eqpvtqn'qxgt"Hkpcpekcn'Tgr qt\kpi ."\j g" Eqo r cp { 'uj cm'guvcdnkuj "c'u\{uvgo 'vq"gpuwtg'tgnkcdkrkv{ "qh'hkpcpekcn'tgr qt\kpi "qh" yj g"y j qng'I tqwr 'hqt'\j g"r wtr qug'qh'cf gs wcvg'ko r tqxgo gpv'cpf "cf o kpkuvtc\kqp" qh'kpvgtpcn'eqpvtqn'qp'hkpcpekcn'tgr qt\kpi 0'
- *d+" Rwtuwcpv'\q''yi g'tgi wrc\lqpu'ugv'hqtyi "l\p'*c+'cdqxg."\yi g'Eqo r cp{"uj cm'guvcdrluj " c"Eqo o kwgg"hqt"Gxcnwc\lqp"qh" kpvgtpcn'Eqpvtqn'qxgt"Hkpcpekcn'Tgrqt\lpi ." y j kej " uj cm' f grkdgtcvg" qp" cpf " kpxguvki cvg" o cwgtu" eqpegtpkpi " cppwcn' ko r tqxgo gpv' cpf " cf o kpkuvtc\lqp" r qrkekgu" cpf " gxcnwc\lqp" r mcpu." o cwgtu" eqpegtpkpi "\yi g'f gvgto kpc\lqp"qh'\yi g'gxcnwc\lqp"ueqr g."gve0'
- *e+" Vj g" Kpvgtpcn' Cwf kv" Qhhleg" uj cm' eqpf wev' r gtkqf ke" gxcnwcvkqp" qh" vj g" ghlgevkxgpguu'qh'kpvgtpcn'eqpvtqn'cu'y gm'cu'pgeguuct { 'ko r tqxgo gpvu'vj gtgqh0'

*x+" Ugxgtcpeg"qh"cm"tgrcvkqpu"y kij "cpvkuqekcn"hqtegu<"

- *c+" Vj g"Eqo r cp{"uj cm" f gcn" y kj "cp{"r gtuqp"qt" i tqwr." kpenwf kpi "cp{"etko g" u{pf kecvg" cpf " eqtr qtcvg" tcengvggt." y j q" gpi ci gu" kp" cpvkuqekcn" cevkxkkgu." xkqngpeg"cpf "kngi kko cvg"f go cpf "kp"c"tguqnwg"cwkwf g"cpf "ugxgt"cm"tgncvkqpu" y gtgy kj 0'
- *d+" Kp"yi g"gxgpy"yi cv"cp{"cpvkuqekcn"hqteg"ugvu"qp."yi g"Eqo r cp{"uj cm"tguqnwgn{" tghwug'y kyi qwv'i kxkpi "kp"cpf "cev'r tqr gtn{"r wtuwcpv'vq"yi g'O cpwcn'hqt"O gcuwtgu" ci ckpuv'Cpvkuqekcn'Hqtegu0'
- $\begin{tabular}{ll} \begin{tabular}{ll} \beg$
 - *c+" Vq''ugewtg''ghhekgpv''gzgewkqp''qh''dwukpguu."vj g'Eqo r cp{''uj cm'j cxg''Gzgewkxg'' Qhhegtu0'
 - *d+" Rwtuwcpv''vq"'yi g"Tgi wrcvkqpu"qh"F wkgu"cpf "Rqy gtu"cpf "yi g"Tgi wrcvkqpu"qh" Gz gewkqp" qh" Dwukpguu." yi g" Eqo r cp{" uj cm' engctn{"f ghkpg" yi g" tqngu" cpf "cwj qtkkgu"qh" yi g" Dqctf "qh"F ktgevqtu."Tgr tgugpvcvkxg"F ktgevqtu"cpf "qyi gt" F ktgevqtu0'
 - *e+" Cu" cp" qti cp" vq" f kuewuu" cpf " f grkdgtcvg" qp" o cpci go gpv' uvtcvgi kgu" cpf "
 o cpci gtkcn' kuuwgu" qh" yi g" y j qrg" I tqwr " cpf " gcej " dwukpguu" f kxkukqp." yi g"
 Eqo r cp{ 'tuj cm'guvcdrkuj 'c'O cpci go gpv'Eqo o kwgg'eqo r tkugf 'qh'yj g'Rtgukf gpv'
 cevkpi 'cu'ej ckto cp'cpf 'qyj gt'o go dgtu'cr r qkpvgf 'd{ 'yj g'ej ckto cp.'y j kej 'tuj cm'

- *xkk+" U{uvgo u"vq"ugewtg" yig"rtqrgtpguu"qh"dwukpguu"cevkxkkkgu"qh"yig"eqtrqtcvg"itqwr"eqortkugf"qh'yig"Eqorcp{."kwu'rctgpv'eqorcp{"cpf"kwu'uvxdukfkctkgu≺"
 - *c+" Kp"yj g"Chhkhcvgf "Eqo r cpkgu"O cpci go gpv"Tgi wrcvkqpu."yj g"Eqo r cp{"uj cm" ur gekh{"uwdukf kctkgu"wpf gt "f kt gev'eqpvtqn'qh'yj g"Rt gukf gpv'cpf "uwdukf kctkgu"hqt" y j kej " yj g" uwr gtxkukpi " qhhkeg" uj cm' dg" tgur qpukdrg." vq" engctn{" f ghkpg" tgur qpukdkrkkgu" hqt" dwukpguu" cf o kpkuvtcvkqp0' " Gcej " uwdukf kct {" uj cm' r gtkqf kecm{ 'hkrg'tgr qt vu'qp'ksu'r gthqto cpeg"cpf "qvj gt"o cwgtu0'
 - *d+" Kp" yi g"Chhkhcvgf "Eqo r cpkgu"O cpci go gpv"Tgi wrcvkqpu." yi g"Eqo r cp{"uj cm" r tqxkf g"c"hwpf co gpvcn'r qrke{"vq" yi g"ghhgev" yi cv"\$vtcpucevkqpu" y kyi "chhkhcvgf" eqo r cpkgu'uj cm'dg"dcugf "qp"o ctmgv'r tkegu. "kp"r tkpekr ng\$. "vq"r tgxgpv'eqphhewu" qh'kpvgtguv0'
 - *e+" Kp"yi g"Chhkrkevgf "Eqo repkgu"O epei go gpv"Tgi wrevkqpu."yi g"Eqo rep{"uj em" rtqxkf g'hqt'yi g'twrgu'hqt'euuwo rvkqp'qh'qhhkeg'qh'f ktgevqtu'epf 'uvewwqt {"ewf kqtu" qh'ku'uwdukf ketkgu."r wtuwepv'vq"y j kej "yi g"Fktgevqtu"qh'yi g"Eqo rep{"uj em'pqv" cuuwo g'qhhkeg'qh'f ktgevqtu'qh'yi g'uwdukf ketkgu."kp"rtkpekrrg0'
 - *f+" Vj g"Eqo r cp{"uj cm"ko r tqxg"qr gtcvkqpcn"ghhkelgpelgu"d{"wkrk kpi "vj g"I tqwr/uvcpf ctf "KV"kphtcuvtwewtgu"cpf "kpvgi tcvkpi "vj g"vcumu"qh"qxgtj gcf "f kxkukqpu0"
- *xkkk+" O cwgtu'eqpegtpkpi ''y g''go r m{ggu''\q''cuukuv'\y g''U\cwwqt{''Cwf kqtu''qh''\y g'Eqo r cp{''\q'' gzgewg''\y gkt''f wkgu''y j gp''\y g''U\cwwqt{''Cwf kqtu''tgs wguv'\y g''cuuki po gpv'\y gtgqh\ck''
 - Vj g"Eqo r cp{"uj cm"wr qp"tgs wguv'htqo "vj g"Uvcwwqt{"Cwf kqtu."cuuki p"kuu"go r mq{ggu" cu'uvchh'qh'vj g'Uvcwwqt{'Cwf kqtu)'Uget gwctkcv'vq"cuukiv'vj g'Uvcwwqt{'Cwf kqtu'vq"gz gewg" vj gkt"f wkgu0'
- *kz+" O cwgtu'\q'ugewtg'\j g'kpf gr gpf gpeg'qh'\j g''go r m{ggu'ugv'hqt y 'kp''\xkkk+'cdqxg'htqo '\j g'' F ktgevqtu'cpf '\j g''ghhgevkxgpguu'qh'f ktgevkqpu'i kxgp'\q''y g''go r m{ggu<''
 - *c+" Uvchh'cv''yi g"Uvcwwqt {"C wf kqtu)"Ugetgvctkcv''uj cm''ugtxg"qp"c"hwm'vko g"dcuku0' " Vj g"hkpcn'f gekukqp"qp"r gtuqppgn'ej cpi gu."gxcnwcvkqpu."gve0'qh''yi g"Uvcwwqt {" C wf kqtu)'uvchh'luj cm'dg'uwdlgev'\q'eqpugpv'qh'\yi g'Uvcwwqt {'C wf kqtu."y j kej "luj cm' dg'r tqxkf gf "hqt"kp"yi g"kpvgtpcn't wrgu'qh''yi g'Rgtuqppgn'F gr ctvo gpv0'
 - *d+" Kp''y g'Tgi wrcwlqpu'qh'Ugi tgi cwlqp''qh'F wwlgu.''y g'Eqo rcp{''uj cm'rtqxkf g'hqt''y g'' f wwlgu''qh''y g''Ucwwqt{''Cwf kqtu)'Ugetgyctkcv0'
- *z+" U{uvgo "hqt" tgr qtvkpi "d{" yi g"F ktgevqtu" cpf "go r nq {ggu" qh" yi g"Eqo r cp {" cpf "ku" uvdukf kctkgu"cpf 'yi g'uvcwwqt {"cwf kqtu"qh'yi g'uvdukf kctkgu"vq"yi g"Uvcwwqt {"Cwf kqtu"yi g" Dqctf "qh"Uvcwwqt {"Cwf kqtu+"qh"yi g"Eqo r cp {"cpf "qyi gt"u {uvgo u"hqt"tgr qtvkpi "vq"yi g" Uvcwwqt {"Cwf kqtu'qh"yi g"Eqo r cp {<"

"

*c+" Vj g'F ktgevqtu."vj g'Gzgewkxg'Qhhlegtu."vj g'Ugpkqt'Gzgewkxg'Qhhlegtu."vj g'j gcf "qh" gcej "dwukpguu" f kxkukqp" cpf "vj g" I gpgtcn" O cpci gt "qh" Uchgv{"cpf "Gpxktqpo gpvcn'Rtqvgevkqp"cpf "S wcnkv{"Cuuwtcpeg"F gr ct vo gpv'uj cm "r wtuwcpv"vq"vj g"Tgi wrcvkqpu'qh'Gzgewkqp"qh'Dwukpguu."tgr qtv'vj g'ur gekhkgf "o cwgtu'vq"vj g"Ucwwqt{"Cwf kqtu0"

- *d+" Vj g"Kpvgtpcn"Cwf kv"Qhhkeg"uj cm"r wtuwcpv"vq"yj g"Kpvgtpcn"Cwf kv"Tgi wrcvkqpu." tgr qtv'yj g"tguwnu"qh"cwf ku"vq"yj g"Uvcwwqt { "Cwf kqtu0"
- *e+" Vj g" Qr gtcvkqpcn" Tkum' O cpci go gpv' cpf " Eqo r nkcpeg" Eqo o kwgg" uj cm' r gtkqf kecm{ 'tgr qt v'vj g''uvcvg''qh''eqpuwncvkqpu''cpf "o gcuwtgu''cv''vj g''Eqo r nkcpeg" Eqpvcev'Qhhkegu''vq''vj g''Uvcwwqt { 'C wf kqtu0'
- *zk# U{uvgo "vq"gpuwtg" y g"r tgxgpvlqp"qh"vphckt" vtgcvo gpv'qh" y g"r gtuqp" y j q"j cu"i kxgp"c" tgr qtv'wpf gt" z+"cdqxg"dgecwug"qh'uwej 'tgr qtv."

"

"

- *c+" Ki'uj cm'dg'r tqj kdkgf ''vq''vtgcv'wphcktn{ ''vj g'r gtuqp''y j q''j cu''i kxgp''c'tgr qtv'wpf gt" *z+"cdqxg''dgecwug''qh'uwej 'tgr qtv0'
- *d+" Vj g"Qr gtcvkqpcn'Tkum'O cpci go gpv'cpf "Eqo r ncpeg"Eqo o kwgg"uj cm'f getgg" yj cv'cp{ "r gtuqp"uj cm'pqv'dg" vtgcvgf "wphcktn("dgecwug"qh"eqpuwnkpi "y kyj "y g" Eqo r ncpeg'Eqpvcev'Qhhkegu'cpf 'uwkr wrcvg'kp'yj g'Eqo r ncpeg'I cpf dqqm'vq'yj cv' ghgev'cpf "o cmg'ky'yj qtqwi j n("gf wecvgf 'yj tqwi j "vtckpkpi "cpf "qvj gt 'uguukqpu0'
- *zkk+" O cwgtu"eqpegtpkpi "yj g"r qrke{"vq"r c{"gzr gpugu"kpewttgf "d{"yj g"Uvcwwqt{"Cwf kqtu"kp" gzgewkpi "yj gkt"f wkgu<"

Cm'gzr gpugu'pgeguuct { 'hqt 'ij g'Ucwwqt { 'Cwf kqtu'kp'r gthqto kpi 'ij gkt'tqrgu'cpf 'f wkgu." kpenvf kpi "cwf kuu"qh' ij g" gzgewkqp"d { "ij g" F ktgevqtu"qh" ij gkt"f wkgu." grgevkqp"cpf "f kuo kuucn'qh'ij g'ceeqwpv'cwf kqtu. 'uj cm'dg'dqtpg'd { 'ij g'Eqorcp { 0'

- *zkkk" Qyi gt"u{uvgo u"vq"gpuwtg"ghhgevkxg"cwf ku"d{"yi g"Uvcwwqt{"Cwf kqtu"*yi g"Dqctf "qh" Uvcwwqt{"Cwf kqtu+"qh'yi g"Eqo r cp{<"
 - *c+" Vj g"Tgr tgugpvcvkxg"F ktgevqtu"uj cm"j qnf "c"tgi wrct"o ggvkpi "y kij "yj g"Uvcwwqt {" Cwf kqtu"s wctvgtn{. "kp"r tkpekr ng0'
 - *d+" Vj g"Kpvgtpcn'Cwf kv"Qhhleg"uj cm'enqugn("eqqtf kpcvg"cpf "eqqr gtcvg"y kyj "vj g" Uvcwvqt {"Cwf kqtu"cpf "vj g"ceeqwpv'cwf kqtu"y kyj "tgi ctf "vq"kpvgtpcn'cwf kv' uej gf wrgu. "xkukvkpi "cwf kwu. "gve0'

]Uwo o ct{"qh''y g''uvcwu''qh''y g''qr gtcvkqp"qh''y g''u{uvgo u''vq''ugewtg''y g''r tqr gtpguu''qh''dwukpguu'' cevkxkkgu''*uq/ecngf "\$kpvgtpcn'eqpvtqn'u{uvgo u\$+_"

Vj g'Eqo r cp{."kp"ceeqtf cpeg"y kj "'y g"\$u{uvgo u"vq"ugewtg"'y g"r tqr gtpguu"qh"dwukpguu" cevkxkkgu"*uq/ecmgf "\$kpvgtpcn"eqpvtqn"u{uvgo u\$\displays"tguqnxgf "d{"ku"Dqctf "qh"F ktgevqtu." j cu"guvcdnkuj gf "cpf "qr gtcvgf "'y g"kpvgtpcn"eqpvtqn"u{uvgo u"qh" y g"Eqo r cp{"cpf "ku" uvdukf kctkgu0'

Vj g"Eqo r cp{"r rcpu" vq"tgxkug" yj g"\$u{uvgo u" vq"ugewtg" yj g"r tqr gtpguu"qh"dwukpguu" cevkxkkgu" uq/ecrngf '\$kpvgtpcrleqpvtqrlu{uvgo u\$+\$'gxgt {"{gct'chvgt'yj g'kpurkwvkqp'yj gtgqh0'" F wtkpi "yj g"hkuecrl"{gct"wpf gt"tgxkgy ."yj g"Eqo r cp{"qr gtcvgf" yj g"u{uvgo u'r wtuvcpv'vq" yj g"tguqnwkqp"o cf g"cv'yj g"o ggvkpi "qh'yj g"Dqctf"qh'F ktgevqtu'j gnf 'kp'O c{"42390'

Cu"c"tguwn"qh" yi g"f kuewukqpu"d{"yi g"Dqctf "qh"F ktgevqtu."k\"y cu"gxcnwcvgf "yi cv"yi g" ghhgevkxgpguu"qh" yi g"Dqctf "qh"F ktgevqtu" y cu"gpuwtgf "f wtkpi "yi g"hkuecn" {gct"wpf gt" tgxkgy 0' "Kp"cf f kkqp"vq"yi g"cdqxg."o clqt"cevkxkkgu"hqt"kpvgtpcn'eqpvtqn'yi cv'y gtg"

eqpulf gtgf "ko r qtvcpv"f wtkpi "vj g"hkuecn"{ gct "wpf gt "tgxkgy "ctg"cu"f guetkdgf "dgnqy <"

*k+" Cevkxkvkgu'hqt "eqo r nkcpeg<"

- *c+" F wtkpi "yj g"hkuecn' { gct "wpf gt "tgxkgy . "yj g"Eqo r nkcpeg"Eqo o kwgg"j grf "hqwt" o ggwlpi u "cpf "yj g'eqo r nkcpeg"uwwu'y cu'eqphkto gf "cpf "yj g'eqo r nkcpeg'ghhqtw" y gtg'f grkdgtcvgf 0'
- *d+" Vj g"Eqo r cp{"j cu"gzgt vgf "ku"ghqt vu" vq"tckug"cy ctgpguu"qh"eqo r nkcpeg"d{" f kuugo kpc kpi 'vj g'Eqo r nkcpeg"J cpf dqqn"cpf "eqo r nkcpeg/tgrc vgf "ecugu"kp"cpf "qwukf g"qh"vj g"Eqo r cp{"vj tqwi j "vtckpkpi "uguukqpu"j gnf "d{"vj g"Eqo r nkcpeg" Eqo o kwgg" hqt" kuu" dwukpguu" qhhkegu" cpf "uwdukf kctkgu" pcvkqpy kf g." vtckpkpi "uguukqpu"j gnf "d{"kuu"j wo cp"tguqwtegu"f kxkukqp"hqt"pgy "go r m{ggu"cpf "vtckpkpi "uguukqpu"hqt"pgy "o cpci gtu."cu"y gm"cu"d{"wkrk kpi "kuu"kpvtcpgv0" "F wtkpi "vj g"hkuecn" {gct" wpf gt" tgxkgy ." vj g" Eqo r cp{"uvctvgf" f kuvtkdwkpi " c" o qpvj n{"eqo r nkcpeg"g/o ckripgy urgwgt"vq"vj g"go r m{ggu0'
- *e+" Vj g"f gvcknu"qh"eqpuwncvkqpu"j cpf rgf "cpf "o gcuwtgu"vcmgp"d{"vj g"Eqo r nkcpeg"
 Eqpvcev'Qhhkegu"j cxg"dggp"tgr qtvgf "vq"vj g"Eqo r nkcpeg"Eqo o kwgg"vq"tgur qpf "
 vq"gcej "ecug"cpf "ko r rgo gpv"o gcuwtgu"vq"r tqo qvg"eqo r nkcpeg"kp"vj g"hwwtg0"
 F wtkpi "vj g"hkuecn"{gct"wpf gt"tgxkgy ."vj g"Eqo r cp{"eqpukf gtgf "guvcdrkuj kpi "
 Eqo r nkcpeg"Eqpvcev"Qhhkegu"gcukn{"ceeguukdrg"d{"qxgtugcu"go r rq{ggu."cpf"
 f gekf gf "vq"guvcdrkuj "vj go "kp"vj g"423: 'hkuecn'{gct0'
- *f+" Vj g"Eqo r cp{"guvcdrkuj gf "c"Rtqewtgo gpv'Eqo o kwgg"cpf "uvctvgf "f grkdgtcvkqpu" vq" kpetgcug" vtcpur ctgpe{." hcktpguu" cpf " r tqr tkgv{" qh" f gekukqp/o cmkpi " hqt" r tqewtgo gpv'vtcpucevkqpu0" "

*kk+" Cevkxkkgu'hqt'tkum'o cpci go gpv<"

- *c+" F wtkpi "yj g"hkuecn" {gct "wpf gt" tgxkgy ."yj g"T kum'O cpci go gpv'Eqo o kwgg"j gnf "hqwt "o ggvkpi u0" "Vj g'Eqo o kwgg"cppwcm {"kf gpvkhkgu"o cvgtkcn't kumu"yj cv't gs wkt g"i tqwr/y kf g"eqpvkpwgf "o qpkqt kpi ."cpf "hqto wrc ygu"c"r rcp'hqt "r tgr ctgf pguu"cpf "eqphkto u" yj g" kor ngo gpvcvkqp" qh" yj g"r ncp0' "Hqt" yj g" 4239"hkuecn" {gct." yj g"Eqo o kwgg"kf gpvkhkgf "gpxktqpo gpvcn'r qmwkqp."kphqto cvkqp"u {uvgo "hckmtg." ygttqtkuo ."gve0'cu'o cvgtkcn't kumu'cpf "o cf g'ghhqt wu'vq'eqpvtqn'yj gug't kumu'0" Dcugf "qp'yj g'r tqi tguu'qh'uwej "ghhqt vu. 'yj g'Eqo o kwgg'j cu'ugv'yj g'o cvgtkcn't kumu'hqt'yj g"423: "hkuecn' {gct0'
- *d+" Hqt"yj g'r wtr qug"qh'tkum'o cpci go gpv."yj g'Eqo r cp{"j cu"hqewugf "kwu"ghhqtwu"qp" tgs wktkpi "cp" ko o gf kcvg" tgr qtv' cu" uqqp" cu" cp{"ceekf gpv." f kucuvgt" qt" qvj gt" go gti gpe{"ku'tgeqi pk| gf "cpf '\cmkpi "c'i tqwr/y kf g'eqwpvgto gcuwtg''kp"cp"gctn{" uvci g'\q'r tgxgpv\kv'htqo "gpncti kpi 0'
- *e+" Y kij "tgi ctf "vq" ij g"Dwukpguu" Eqpvkpvkk { "Rrcp" *DER+" kpurkwwgf "hqt" o gcuwtgu" ci ckpur'cp "gr kegpvtch" gctyj s wcng" kp" ij g"Vqm (q" o gvtqr qrkscp" ctgc. "cp" ko o gpug" gctyj s wcng" kp" ij g" P cpmck" Vtqwi j "ctgc" cpf "c" pgy "v{r g" qh" kphrwgp| c." ij g" Eqo r cp{" j cu" qti cpk gf "eqo r tgj gpukxg" f kucuvgt" o cpci go gpv" f tkmu" qp" c" tgi wrct" dcuku" vq" gpuwtg" k/" ghhekgpv0' " Uko wrcpgqwm{." d{" vcnkpi "kpvq" eqpukf gtcvkqp" cp{"co gpf o gpv" vq" ij g"i qxgtpo gpv)u" f kucuvgt" r tqlgevkqpu." ig g"

f gxgnqr o gpv'qh''gcty s wcng"tgukncpv''eqpuvtwevkqp"qh''ku"hcekrkkgu. "kpenwf kpi " wcpmi"cpf "lgwkgu"cpf "r qkpvu"hqt"eqpukf gtcvkqp"qh"yi g"eqo r tgj gpukxg"f kucuygt" o cpci go gpv'f tkmı. "yi g"Eqo r cp{"j cu"tgi wrctn{"tgxkgy gf "yi g"r rcp"vq"o cng"k/" wr f cvgf "cv'cm'vko gu0' " Kp"cf f kxkqp. "gcej "qh'yi g"tghkpgtkgu. "r rcpvu. "f gr ctvo gpvu" cpf "uvqtgu"j cu"eqpf wevgf "f kucuygt"o cpci go gpv'f tkmı "kp"r tgr ctcvkqp"hqt"cp{" go gti gpe{0' " F wtkpi " yi g" hkuecn' { gct" wpf gt " tgxkgy . " yi g" Eqo r cp{" uvctvgf " f grkdgtcvkqpu"cpf " tgur qpug"f tkmı" vcnkpi " kpvq" ceeqwpv''yi g" i tqy kpi " tkımı" kp" qxgtugcu'o ctngvı0' " Kv'cnq'ko r rgo gpvgf 'ko r tqxgo gpvu'kp'kphqto cvkqp'ugewtkv{ " cwf kv'u{uvgo u'cpf "qyi gt 'tgrgxcpv'o gcuwtgu'vq "gpj cpeg'ku'kphqto cvkqp'ugewtkv{ 0'

*f+" F wtkpi " yi g" hkuecn' {gct" wpf gt" tgxkgy ." yi g" Eqo r cp{" guvcdrkuj gf " c" Etgf kv' Eqo o kwgg"cpf "uvctvgf "f grkdgtcvkqpu"vq"tgur qpf "vq"yi g"kpetgcugf "etgf kv'cpf" tgegkxcdrgu"tkumu" cuuqekcvgf " y kyi " qxgtugcu" f gxgrqr o gpv"qt"qyi gt" tgrgxcpv' hcevqtu0'

*kkk+" O gcuwt gu'\q "gpuwt g"ghhge\kx g"cwf ku'd { '\j g"U\cwwqt { ''Cwf kqtu<''

- *c+" Vj tqwi j "tgi wrct" o ggwlpi u" j grf "d { " vj g" Tgr tgugpvcvkxg" F ktgevqtu" y k j " vj g" Ucwwqt { " Cwf kqtu." cpf " uguulqpu" qh" vj g" O cpci go gpv! Eqo o kwgg." vj g" Eqo r nkcpeg'Eqo o kwgg." vj g"Tkum!O cpci go gpv!Eqo o kwgg."gve0" vj g'Eqo r cp { " j cu" uj ctgf " y k j " vj g" Ucwwqt { " Cwf kqtu" xctkqwu" kuuwgu. " kpenwf kpi " vj qug" qh" eqo r nkcpeg" cpf "tkum!o cpci go gpv0'
- "Kp"cffkklqp." yi g"Eqorcp{"j cu"gzgtvgf"ku"ghqtvu"vq"ocng"dgwgt"kphqtocvkqp" gzej cpi gu"dgwy ggp"yi g"Uwwwqt{"Cwfkqtu"cpf" yi g"ceeqwpv"cwfkqtu"qh"yi g" Eqorcp{"cpf"dgwy ggp"yi g'uwwwqt{"cwfkqtu"qh'ku'uwdukfkctkgu"cpf"yi g'Kpvgtpcn" Cwfky'Qhhkeg"cpf"gpj cpeg"eqqrgtcvkqp"dgwy ggp"yi g"Qwukfg"Fktgevqtu"cpf"yi g" Qwukfg"Uwwqt{"Cwfkqtu"d{"j qnfkpi "tgi wrct"oggvkpi u0"
- *d+" D{"r tqxkf kpi "o qtg"qr r qtwxpkkgu"vq"xkuk/"kuu"dwukpguu"qhhkegu"cpf "uwdukf kctkgu" kp"cpf "qwukf g"qh"Icr cp."yj g"Eqo r cp{"j cu"gpj cpegf "yj g"ghhkekgpekgu"qh"yj g" cwf ku"d{"yj g"hwm/wo g"Uwwqt {"Cwf kqtu."cu"y gm'cu"yj g"Qwukf g"Uwwqt {"Cwf kqtu"ou"y gm'cu"y gm'

*kx+" O gcuwt gu'hqt 'kpvgt pcn'cwf ku<"

"

- *c+" Kp"ceeqtf cpeg"y kj "ku"cppwcn"kpygtpcn"cwf kv'r ncp. "vj g"Eqo r cp{"j cu"ur gelklgf" vj g"\$uvcwu"qh"cej kgxgo gpv"qh"o cpci go gpv"vcti gw\$. "\$uej go gu"vq"r tgxgpv"cpf "o kki cvg"tkumu\$. "\$uvcwu"qh"eqo r ncpeg\$"cpf "\$ghhgevkxgpguu"cpf "ghhkekppe{"qh"dwukpguu"qr gtcvkqpu\$"cu"ng{"kgo u"qh"kpvgtpcn"cwf ku"cpf "eqpf wevgf "kpvgtpcn"cwf ku"qh"ku"dwukpguu"qhhkegu"cpf "uwdukf kctkgu"kp"cpf "qwukf g"qh"Lcr cp0" "F wtkpi" vj g" hkuecn" {gct" wpf gt"tgxkgy ." kpvgtpcn" cwf ku" qh" 3; "f gr ctvo gpwu"kpenwf kpi "eqo r tkukpi "qh"34"f qo guvke"f gr ctvo gpwu"cpf '9"qxgtugcu"f gr ctvo gpwu"kpenwf kpi "37"chhkrkcvgu+."y gtg"eqpf wevgf 0"
- *d+" Y kij "tgi ctf "vq"kpvgtpcn"eqpvtqn"qxgt"hkpcpekcn"tgr qtvkpi ."vj g"Eqo r cp{"j cu" gxcnwcvgf 'vj g'lvcwu'qh'guvcdnkuj o gpv'cpf 'qr gtcvkqp'qh'vj g'lv{uvgo u'cpf 'luej go gu" i tqwr/y kf g'kpvgtpcn'eqpvtqn+"cpf 'vj g'lvcwu'qh'f qewo gpvcvkqp"cpf 'qr gtcvkqp"qh' dwukpguu'r tqeguugu"*dwukpguu'r tqeguu'eqpvtqn+"cpf "j cu"qdvckpgf "eqphtto cvkqp" htqo " vj g" Eqo o kvgg" hqt" Gxcnwcvkqp" qh" Kpvgtpcn' Eqpvtqn' qxgt" Hkpcpekcn' Tgr qtvkpi 0'

*x+" O gcuwt gu'hqt "o cpci go gpv'qh'uwdukf kctkgu<"

- *c+" Vj g"Eqo r cp{"j cu"hqto wrwgf "Tgi wrwkqpu"qh"F wkgu"cpf "Rqy gtu"wpkxgtucm{" cr r rlecdrg"vq"y g"Eqo r cp{"cpf "kuu"uwdukf kctkgu."cpf "y kij "tgi ctf "vq"cp{"kuuwg" eqpegtpkpi "cp{"qh"y g'uwdukf kctkgu'y cv'ku'ko r qtvcpv'vq'y g'I tqwr."y g'Eqo r cp{." hqmqy kpi " ectghwri eqpukf gtcvkqpu" cv" ku" Dqctf " qh" F ktgevqtu." O cpci go gpv' Eqo o kwgg. "Kpxguvo gpv'Eqo o kwgg. "gve0"kp"ceeqtf cpeg"y kij "uwej "tgi wrwkqpu." j cu"o cf g"c"f gekukqp0"
- *d+" Vj g'Eqo r cp{'j cu'dggp'eqpf wevkpi 'c'uwwf {'qp'uvcpf ctf k| kpi 'cpf 'wpkh{kpi 'vj g'' dwukpguu'r tqeguugu'cpf 'u{uvgo u'qh'vj g''gpvktg''I tqwr ''cpf ''egpvtcnk| kpi ''engtkecn'' y qtm' eqpegtpkpi "go r m{gg)u" y grhctg" r tqi tco u"qt" qvj gty kug" vq" o cmg" vj g'' dwukpguu'qr gtcvkqpu'qh'vj g'I tqwr ''o qtg"ghhkekgpv0'
- *e+" Cwf ku''qh''y g''uwdukf ketkgu''d { "'y g''Uvcwwqt { "Cwf kqtu''etg''cu''f guetkdgf "kp''kgo " "kkk+" "d+"edqxg''epf "kpygtpen'ewf ku''qh''y g''uwdukf ketkgu''etg''eu''f guetkdgf "kp''kgo " "kx+" "e+" edqxg0' " F wtkpi " y g" hkueen' { get " wpf gt " tgxkgy ." vq " kpetgeug" y g " ghgevkxgpguu" qh'' ewf ku'' d { " y g" uvcwwqt { " ewf kqtu" qh'' ku'' uwdukf ketkgu." y g " Eqo r cp { "f gekf gf "vq''ko r ngo gpv."epf "uvctvgf "o enhpi "vtcpukkqpu"vq."e"u{uvgo " y j gtg''ku''go r nq { ggu."y j q'y gtg''gngevgf "r wtuwcpv'vq"y g'Chhkrlevgf "Eqo r cpkgu" O epci go gpv''T gi wrevkqpu''epf "ugtxg"cu''P qp/gzgewkxg"Uvcwwqt { "Cwf kqtu"qh" uwdukf ketkgu."dgnqpi "vq''y g'öCwf kv'("Uwr gtxkuqt { "Ugevkqp'hqt'I tqwr 'Eqo r cp{ö" guvcdnkuj gf "kp'y g''Kpvgtpen'Cwf kv'Qhhkeg0' "

*9+" Hwpf co gpvcn'r qnle { "qp"eqtr qtcvg"eqpvtqn<"

 $\label{thm:constraint} Vj\ g"Eqo\ r\ cp{"ij\ cu"gzgtvgf\ "ku"ghqtvu"vq"cvckp"eqpuvcpv"cpf\ "uwuvckpcdng"i\ tqy\ vj\ "vq"\ ugewtg"cpf\ "gpj\ cpeg"vj\ g"eqtr\ qtcvg"xcnwg"qh'vj\ g"I\ tqwr\ "cpf\ "vj\ g"eqo\ o\ qp"kpvgtguvu"qh'ku"\ uj\ ctgj\ qrf\ gtu0'$

J gpeg. 'kp''y g''gxgpv''y cv'cp{'rctv{''gpi ci gu'kp''cp{'rcti g''r wtej cug''cevkqp''y kyj 'tgi ctf ''vq'' y g''uj ctgu''qh''y g''Eqo rcp{''cpf ''eqpugs wgpw{.''kv''y tgcvgpu''vq''r tglwf keg''y g''eqtr qtcvg'' xcnwg''qh''y g''I tqwr ''cpf ''y g''eqo o qp''kpvgtguvu''qh''kw''uj ctgj qrf gtu. ''kv''ku''y g''Eqo rcp{')u'' hwpf co gpvcn'r qrke{''vq''cng''cp{''crrtqrtkcvg''o gcuwtg''vq''y g''gzvgpv'r gto kwgf ''d{''hcy u''qt'' qtf kpcpegu''cpf ''y g''Ctvkergu''qh''Kpeqtrqtcvkqp0'

EOP UONKF CVGF 'DCNCPEG'UJ GGV'' *Cu'qh'O ctej '53.'423: +"

	*o kmkqp"{gp+
CUUGVU'	"
Ewttgpv'cugwk'	3.444.; 88"
Ecuj 'cpf 'f gr quk'	::.646"
P qvgu'cpf 'ceeqwpw'tgegkxcdrg/vtcf g''	6: 8.3: 7"
Kpxgpvqtkgu"	757.858"
Fghgttgf"\cz"cuugvu"	36.952"
Qyjgt "ewttgpv"cuugw" "	;:.644"
Cmqy cpeg'hqt'f qwdvhwi'ceeqwpwi"	*654+
Hzgf 'curgw<'	3.8; 9.4; : "
Vcpi klrg'hkzgf 'curgw'	3.228.9: 4"
Dwlaf kpi u'cpf 'uxt wewt gu'	3: 5.48; "
O cej kpgt {."gs wkr o gpv'cpf "xgj kergu"	3: 7.; 7; "
Ncpf"	79; .965"
Eqpust weskqp'kp'r tqi tguu"	35.279"
Qyi gt "cpi kdrg"hkzgf "cuugvu"	66.975"
Kpwpi klrg'hkzgf 'bugw'	42.98: "
I qqfykm""	8.945"
Qyj gt'kpvcpi kdrg'hkzgf'cuugvu''	36.267"
Kpxguno gpv'cpf 'qvj gt 'cungwi'	88; .968"
Kpxguvo gpv'ugewtkukgu''	644.658"
Kpxguvo gpvu'kp''ecr kcn'qh'chhkrlcvgu''	47.69; "
Nqpi/vgto 'mqcpu'tgegkxcdrg''	78.56: "
Cuugvu'hqt'go rm{ggu)'tgvktgo gpv'dgpghku''	566"
Fghgttgf"vcz"cuugvu"	72.288"
Qkrihkgrf 'r tgo kwo ''cuugwu''	55.2: 3"
Qyj gt'lpxguvo gpvu''	: 4.276"
Cmqy cpeg'hqt'f qwdvhwiceeqwpw'	*86+
VQVCN'CUUGVU' Pqvg+"Hki wtgu"ctg"kpfkecvgf"d{"fkuectfkpi"htcevkqpu"nguu"vjcp"qpg"o	4.; 42.487''
4.2 2. c.2. At 12. 2. at 1 mooth the moon adher from it ob db2 o	1r (5r°

"

	*o knk qp"{ gp-
NKCDKNK/KGU'	•
Ewttgpv'flcdkikklgu<'	3.384.939'
P qvgu'cpf 'ceeqwpvu'r c {cdrg/vtcf g''	64; .772"
Uj qt√vgto "dqttqy kpi u"	364.: 95"
Eqo o gteknir cr gt"	35: .223"
Ewttgpv'r qtvkqp"qh'dqpf u"	47.222"
Ceeqwpwl'r c{cdrg."qvj gt"	4; 7.643"
Ceetwgf 'kpeqo g'\czgu''	49.764"
F ghgttgf '\cz'hcdkrkkgu''	3.332"
Cmqy cpeg'hqt'dqpwigu"	: .333"
Qyj gt "ewttgpv"rkcdkrkkgu" "	; 7.328"
Nqpi/vgt o 'fle dklølgu<'	: 73.839'
Dqpf u"	62.222"
Nqpi/vgto 'f gdv'	768.393"
F ghgttgf "\cz"rkcdkrkkgu"	32.; 55"
F ghgttgf "\cz"hcdkrkkgu"\wr qp"tgxcnxc\kqp"	: 9.; 94"
Nkcdkrkv{ 'hqt'go r m { ggu)'tgvktgo gpv'dgpghkvu''	35.; 94"
Tgugtxg'hqt'tgr ckt'y qtmu''	49.334"
Cuugy'tgyktgo gpy'qdrki cykqpu"	6; .39: "
Qkrlhkgrf 'r tgo kwo 'rkcdkrkkgu''	5; .496"
Qyj gt 'nqpi /vgto 'nkcdknkkkgu'' "	59.224"
Vqvenikedkisigu''	4.236.557'
	"
PGV'CUUGVU'	1
Uj ctgj qrf gtu)'gs wlw{''	924.: 5; '
Eqo o qp'uvqen'	38: .573"
Cffkkqpcn'rckf/kp"ecrkcn'	352.: 97"
Tgvckpgf "gctpkpi u"	625.967"
Vtgcuwt { 'uvqemı''	*355-
Ceewo wrvgf 'qvj gt 'eqo rtgj gpukxg'lpeqo g''	387.: 83'
Wptgcnk gf 'j qrf kpi 'i ckpu'qp'qyj gt'ugewtkkgu"	32.327"
F ghgttgf "i clpu" "quu+"qp"j gf i gu" Tanananan "f Hart an a s"ald ban f "	*6.2: 5-
Tgxcnwcwlqp"fkhhgtgpeg"qh"hcpf" Vtcpuncwlqp"cflwuvogpw"	37: .393" ; 3; "
Tgvktgo gpv'dgpghkv'hcdkrkv{ ''cf lwuvo gpv'	96: "
Pqpeqpvt qmlpi 'lpvgt guwi'	59.44: '
	;27.;4;
Vqvcriþgv'cugvu''	, - ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '

"

$\underline{\textbf{EQP UQNMF CVGF 'UVCVGO GP V'QHMP EQO G''}}$

Crtkd3.''4239''vq'Octej''53.''423: +''

*o kmkqp"{gp+"

		*o kmkqp"{gp+"
Ceeqwpv'Vkng''	Co	qwpv''
Pgv'icrgu'	"	5.952.8; 2"
Equv'qh'incrgu'	"	5.458.: 2: "
Itquu'rtqhks''	***	6; 5.: : 4''
Ugnlpi .'i gpgt cricpf 'cf o lpluxt cvlxg'gzr gpugu''	***	4; 4.77; ''
Qrgtcvlpi 'lpeqo g''	"	423.545"
	"	**
Pqp/qrgtcvlpi 'lpeqo g''''	"	**
Kpvgtguv'kpeqog"	6.846"	"
Flxkfgpf'kpeqog"	4.9; 8"	"
Uwdukf {"kpeqo g"	4.986"	"
Gs wkv{ 'kp''gctpkpi u''qh''chhkrkcvgu''	49.44; "	"
Qyj gtu" "	4.; 44"	62.55: "
	"	"
Pqp/qrgtcvlpi 'gzrgpugu''	***	**
Kpvgtguv'gzrgpugu''	; .877"	"
Qyj gtu"	7.8: ; "	37.567"
Qtf kpct { 'kpeqo g''	"	448.538''
"	"	"
Gzvtcqtf lpct{ 'lpeqo g''	"	**
I ckp"qp"ucrgu"qh"hkzgf"cuugvu"	3.933"	"
I ckp"qp"ucrgu"qh"kpxguvo gpv"ugewtkkgu"	636"	"
I ckp"qp"ucrg"qh"chhkrlcvg"uvqem"	34.358"	"
Qyj gtu"	56"	36.4; 9"
	"	"
Gzvtcqtf lpct{'gzrgpugu''	***	***
Korcktogpv'nquu'qp'hkzgf'cuugvu''	: .949"	"
Nquu'qp'ucrgu'qh'hkzgf "cuugvu" "	498"	"
Nquu'qp'f kur quen'qh'hkz gf 'euugvu''	5.326"	"
Nquu'qp'\tcpukkqp'\q'f ghkpgf 'eqpvtkdwkqp'r gpukqp'' r ncp''	35.: 32"	,,
Qyj gtu"	4.74; "	4: .66: "
Kpeqo g'dghqtg'kpeqo g'\czgu''	"	434.387"
Kpeqo g'kzgu'/'ewttgpv'	64.934"	"
Kpeqo g''kzgu''/'f ghgttgf "	4.866"	67.579"
Pgv'lpeqo g''	11	388.: 29"
P gv'lpeqo g'cwtkdwcdrg'\q'pqpeqpvtqrrkpi 'kpvgtguvu'	"	6.722"
Pgy'lpeqo g'cwtklwcdrg'iq'qy pgtu'qh'ij g'rctgpy'	"	384.529''
	1	1

^{*}Pqvg+"Hki wtgu"ctg"kpf kecvgf "d{"f kuectf kpi "htcevkqpu"rguu"yj cp"qpg"o kmkqp"{gp0'

EQPUQNIFCVGF 'UVCVGO GPV'QH'EJ CPI GU'IP 'UJ CTGJ QNFGTU)'GS WIV .'GVEO' *Crtki'3.''4239''vq'O ctej ''53.''423: +"

*o kmkqp"{gp+"

"	Uj ctgj qrf gtu)'gs wkv{"				
	Eqo o qp'tvqent	Cf f kskqpcn' r ckf /kp"ecr kscn'	Tgvckpgf" gctpkpi u"	Vtgcuxt { 'uvqemı''	Vqvcn' uj ctgj qnf gtu)'' gs wk√ "
Derepeg'ev'Cr tkri3."4239"	32: .828"	93.353"	46; .76; "	*353+	64; .378"
Ej cpi gu'f wtkpi "ý g"{gct"	"	"	,	"	1
Kuwcpeg'qh'pgy 'uvqem'	7; .966"	7; .966"	1	"	33; .6: ; '
F kıvtkdwkqp"qh"tgvckpgf " gctpkpi u"	"	"	*34.538+	"	*34.538+
P gv'lpeqo g"cwtldwcdrg"\q" qy pgtu"qh"\j g"r ctgpv"	"	"	384.529"	"	384.529"
Ej cpi g'kp'ueqr g'qh' eqpuqnkf cvkqp"	"	"	3.::3"	"	3.::3"
Ces wkukkqp"qh'\tgcuwt { " uvqen'i	"	"	"	*3+'	*3+
Tgxgtucn'qh'tgxcnxcvkqp" f khgtgpeg"qh'rcpf "	"	"	4.546"	n	4.546"
Ej cpi g'lp'lwgo u'qyj gt''yj cp'' uj ctgj qrf gtu)'gs wkw{ "f wtlpi '' yj g''{gct'*pgw+"	"	"	11	"	n.
Vqvcn'ej cpi gu'f wtkpi ''yj g''{ gct ''	7; .966"	7; .966"	376.3; 7"	*3+	495.8: 5"
Dcmpeg"cv"O ctej "53."423: "	38: .573"	352.: 97"	625.967"	*355+	924.: 5; "

"	Ceewo wrcygf "qyj gt "eqo r tgj gpulkxg" lipeqo g"							
	Wptgcnklgf" jqnfkpi" ickpu"qp" qvjgt" ugewtkkkgu"	Fghgttgf"	Tgxcnwcwlqp" f khhgtgpeg"qh" ncpf "	X.4 1 !!	Tgvktgo gpv' dgpghkv''	Vqvcn' ceewo wncwgf' qvjgt" eqortg/" jgpukxg" kpeqog"	P qpeqpvtqm/ kpi 'kpvgtguvu''	Vqv:n'pgv' cuugvu"
Derepeg"cv'Crtkri3."4239"	9.839"	*9.935+	377.763"	53: "	*3.33; +	376.866"	58.354"	83; .; 54"
Ej cpi gu'f wtkpi ''y g''{ gct''	=	"	=	=	=	"	"	"
Kuwcpeg''qh'pgy ''uvqem'	=	"	"	=	"	"	"	33; .6: ; "
Fkıxtkdwkqp"qh"tgvckpgf" gctpkpi u""	"	"	"	"	"	"	"	*34.538+
P gv'lpeqo g''cwtldwcdrg''q'' qy pgtu''qh''y g'r ctgpv''	"	"	"	"	"	"	"	384.529"
Ej cpi g'kp'ueqr g'qh' eqpuqntf cvkqp''	"	"	"	"	"	"	"	3.::3"
Ces wkukkqp"qhi'\tgcuwt { " uvqemi'	"	"	"	"	=	"	"	*3+
Tgxgtucn'qh'tgxcnwcwlqp" f khgtgpeg''qh'rcpf"	"	"	*4.546+	"	"	*4.546+	"	/"
Ej cpi g'kp'ksgo u'qvj gt''vj cp'' uj ctgj qrf gtu)'gs vkv{ 'f wtkpi ''								
yj g"{gct"*pgv+"	4.6: : "	5.852"	6.; 75"	822"	3.: 89"	35.762"	3.2; 8"	36.859"
Vqvcn'ej cpi gu'f wtkpi ''y g''{ gct ''	4.6: : "	5.852"	4.84; "	822"	3.: 89"	33.438"	3.2; 8"	4: 7.; ; 9"
Dcrcpeg"cv"O ctej "53."423: "	32.327"	*6.2: 5+	37: .393"	; 3; "	96: "	387.: 83"	59.44: "	; 27.; 4; "

*Pqvg+" Hki wtgu'ctg'kpf kecvgf 'd{ "f kuectf kpi 'htcevkqpu'rguu'vj cp'qpg'o knkqp"{gp0'

PQVGUVQ'EQPUQNIFCVGF'HIPCPEICN'UVCVGOGPVU"

" 30' Ko r qtvcpv'o cwgtu'hqto kpi 'vj g''dcuku''qh'r tgr ctcvkqp''qh'eqpuqnkf cvgf 'hkpcpelcn' uvcvgo gpw" *3+" O cwgtu'eqpegtpkpi 'vj g'ueqr g'qh'eqpuqnkf cwkqp'' *k+" Eqpuqrkf cvgf "uwdukf kctkgu<" • " P wo dgt "qh"eqpuqrkf cygf "uwdukf kct kgu<" 86'eqo r cpkgu" • " P co gu"qh"o clqt "eqpuqrkf cvgf "uwdukf kctkgu<" Kf go kuw'Vcpngt'Eq0'Nvf0' Kf go kuw'Tgvckn'O ctngvkpi 'Eq0'Nvf0' Kf go kuw'Uwr gtxkukpi 'Eq0'Nvf0' UKOGpgti { 'Eq0'Nvf0' Kf go kuw'Kovgtpcvkqpcn'*Cukc+'Rvg0'Nvf0' Kf go kuw'Cr qmq'Eqtr qtckqp" Kf go kuw! Wpkgej 'Eq0' Nvf 0' Kf go kuw'Rgvtqrgwo 'Pqti g'CU' Kf go kuw'Cwutcrkc'Tguqwtegu'Rv{ "Nvf" Kf go kuw'Ecpcf c'Tguqwtegu'Nvf 0' Kf go kuw'Ecpcf c'Eqtr qtckqp"" UF U'Dkqvgej 'MOMO' *kk+" P qp/eqpuqrkf cvgf 'uwdukf kct kgu<" • " P co g"qh"o clqt "pqp/eqpuqrkf cvgf "uwdukf kct {<" Kf go kuw'Nwdg''Vgej pq'Eq0''Nvf0' Tgcuqp"hqt"gzenxf kpi "vj g"pqp/eqpuqrkf cvgf "uwdukf kct kgu"htqo "vj g"ueqr g"qh" eqpuqrkf cvkqp<" Vj g"uecrg"qh"dwukpguu"eqpf wevgf "d{"gcej "qh"vj g"pqp/eqpuqrkf cvgf " uwdukf kct kgu 'ku 'uo cm 'cpf ''y g''vq vcn'cuugvu. ''pgv'ucrgu. ''pgv'kpeqo g''qt ''muu'' *dcugf "qp" yj g"Eqo r cp{)u"gs wkv{ "kpvgtguv+"cpf "tgvckpgf "gctpkpi u" *dcugf " qp"\j g'Eqo r cp{)u'gs wkx{ 'kpvgtguv+"qh'gcej 'pqp/eqpuqrkf cvgf 'uwdukf kct { " f q'pqv'j cxg'c'o cygt kcriko r cev'qp'vj g'eqpuqrkf cygf 'hkpcpekcrilucygo gpvu0'

- " *kkk+' Eqorcp{"kp"yjkej" yjg"Eqorcp{"jqnfu"c"oclqtkv{"qh"xqvkpi"tkijvu"dww"yjkej"ku"pqv" vtgcvgf"cu"c"uwdukfkct{<"
- " " " P co g'qh'\j g'eqo r cp{<' Cuvqo qu'Gpgti {'Eqtrqtc\kqp"
- " " Tgeuqp'hqt"pqv'vtgevkpi "kv'eu'e'uwdukf ket {<
- " " " Curqo qu" Gpgti {"Eqtrqtcvkqp"j cu" dggp"f gvgto kpgf " vq" dg" c" lqkpvn{" eqpvtqmgf "eqo r cp{"r wtuwcpv"vq"Ctvkeng"397"qh"vj g"\$Ko r ngo gpvcvkqp" I wkf cpeg"qp"vj g'Ceeqwpvkpi "Uvcpf ctf "hqt"Dwukpguu"Eqo dkpcvkqpu"cpf " vj g"Ceeqwpvkpi "Uvcpf ctf "hqt"Dwukpguu"F kxgurkwtgu\$"*vj g"Ceeqwpvkpi " Uvcpf ctf u" Dqctf " qh" Icrcp" *\$CUDL\$+" Ceeqwpvkpi " Uvcpf ctf " Ko r ngo gpvcvkqp"I wkf cpeg"P q0'32+"cpf "gzenwf gf "htqo "vj g"ueqr g"qh" eqpuqnkf cvkqp"vq"crrn{"vj g"ceeqwpvkpi "o gvj qf "uko krct"vq"vj g"gs wkx{" o gvj qf 0'
- *4+" O cwgtu'eqpegtpkpi 'y g''cr r nkecvkqp''qh''y g''gs wkx{ "o gy qf "
- " *k+" P qp/eqpuqnkf cvgf "uwdukf kctkgu"cpf "chhkrlcvgu"vq"y j kej "vj g"gs wkv{ "o gvj qf "ku"cr r nkgf <"
 - " P wo dgt" qh" pqp/eqpuqnkf cvgf "uwdukf kctkgu" qt "chhkrkcvgu" vq" y j kej " yj g" gs wkv{ " o gyj qf "ku" cr rkgf <" 4; "eqo r cpkgu"
 - "Pco gu'qh'y g'o clqt 'eqo rcpkgu<' Cuvqo qu'Gpgti { 'Eqtrqtcvkqp''

Kf go kww'Etgf kv'Eq0''Nvf 0'
RU'Ler ep'Eqtr qtevkqp''
Rtko g'Rqn(o gt''Eq0''Nvf 0'

Pijk'Uqp'Tghlpgt{"cpf'Rgvtqej go lecn'NNE"

Uj qy c'Uj gml'Ugmk(w'M0M0'

- " *kk+" Pqp/eqpuqnkfcvgf" uwdukfkctkgu" cpf " chhkrkcvgu" vq" y j kej " vj g" gs wkv{ " o gvj qf " ku" pqv' crrnkgf <"
 - " P co gu'qh''y g''o clqt "eqo r cpkgu<" Wpkqp "Ugnk{ w'Mqi {q'Eq0'Nvf0' Mwq'J qtpi 'Eq0'Nvf0'
- " " Tgcuqp'hqt'pqv'crrn(kpi ''y g''gs wkv{ "o gyj qf ''vq''uwej ''eqo rcpkgu<"
- Vj g"pgv"kpeqo g"qt"nquu"*dcugf "qp"vj g"Eqo r cp{)u"gs wkv{ "kpvgtguv+"cpf "
 tgvckpgf "gctpkpi u"*dcugf "qp"vj g"Eqo r cp{)u"gs wkv{ "kpvgtguv+"qh"gcej "
 eqo r cp{"j cxg"pq"uki pkhkecpv"ko r cev"qp"vj g"eqpuqrkf cvgf "hkpcpekcn"
 uvcvgo gpvu"cpf "ku"qh"pq"ko r qtvcpeg"kp"i gpgtcn"
- " *kkk+' Ur gekcn'o cwgt "eqpegtpkpi "yj g"r tqegf wtg"vq"crrn("yj g"gs wkx("o gyj qf <"

"

Y ký "tgi ctf "vq" ý g"gs wkw{"o gyj qf "eqo r cpkgu" y j qug" dcrcpeg" uj ggv" f cvgu" f q"pqv" eqttgur qpf "vq" ý g"eqpuqrkf cvgf "dcrcpeg" új ggv" f cvg. "Uj qy c"Uj gm" Ugnk{ w"MOMO wugu" ý g" hlpcpekcn" uvcvgo gpvu" ý cv" ctg" dcugf "qp" ý g"vgo r qtct { "hlpcpekcn" tguwnu" qdvckpgf "qp" ý g" eqpuqrkf cvgf "dcrcpeg" új ggv" f cvg. "cpf "qyj gt "eqo r cpkgu" wug" ý g"hlpcpekcn" uvcvgo gpvu" hqt" ý g"eqo r cp{øu" tgur gevkxg" hluecn" { gctuO'

Cuvqo qu" Gpgti {"Eqtrqtcvkqp" j cu"crrkqf" y g" gs wkx{"o gyiqf" vq" kuu" uwdukf kctkgu0' J gpeg." y g"pgv"kpeqo gu"qt" quugu"*dcugf "qp" y g"eqo rcp{)u"gs wkx{"kpvgtguv+"qh" y g" uwdukf kctkgu"ctg"kpenwf gf "kp"kxu"kpeqo g"qt" quu0'

" "5. "/" *5+" O cwgtu'eqpegtpkpi "ej cpi gu'kp"yj g'ueqr g"qh'eqpuqrkf cwkqp"cpf "yj g'ueqr g"qh'cr r rkecwkqp" qh'yj g''gs wkw{ "o gyj qf "

*k+" Ej cpi g'kp''y g'ueqr g''qh''eqpuqrkf cvkqp<"

"

 " P wo dgt "qh" pgy "eqpuqrkf cvgf " uwdukf kct kgu

Vy q'eqo r cpkgu"

 " P co gu"qh'y g"pgy "eqpuqrkf cvgf" uwdukf kctkgu

Kf go kuw'Nwdg''Xkgvpco 'Eq0''Nvf 0'

K go kuw'Nwdg'O kf f rg'Gcuv'('Cht kec'H\ G'' Dqyi "eqo r cpkgu''ctg'kpenwf gf 'kp''yi g''ueqr g'' qh''eqpuqrkf cvkqp''y kyi "eqpukf gtcvkqp''hqt''yi gkt'' ko r qtvcpeg0'

 " P wo dgt 'qh'uwdukf kctkgu'gzenwf gf " htqo 'vj g'ueqr g'qh'eqpuqrkf cvkqp<"

Hkxg"eqo r cpkgu"

 P co gu'qh'y g'uwdukf kct kgu" gzenwf gf 'Intqo ''y g'ueqr g'qh'' eqpuqrkf cvkqp<'' Kf go kuw'Dqi i cdtk'Eqcn'Rv{0'Nko kgf "

Kf go kuw!'Rgvtqrgwo ''WM''Nvf 0'

cpf 'vj tgg"qvj gt"eqo r cpkgu"

K go kuw'Dqi i cdtk'Eqcri'Rv(0'Nko kgf 'ku' gzenwf gf 'htqo ''y g''ueqr g''qh''eqpuqnkf cvkqp'' y ky ''eqpukf gtcvkqp''hqt 'kwu'ko r qtvcpeg=" K go kww'Rgvtqngwo ''WM'Nvf 0'cpf ''y tgg'' qy gt ''eqo r cpkgu''ctg''gzenwf gf 'htqo ''y g'' ueqr g''qh''eqpuqnkf cvkqp''cu''c''tgwwn''qh''y g'' Eqo r cp{øu''ucng''qh''y g''uj ctgu''qh''uwej '' eqo r cpkgu0'

*kk+" Ej cpi g'kp''y g'ueqr g''qh''cr r nkecvkqp''qh''y g''gs vkv{ ''o gyj qf <'

P qv'cr r nlecdrg"

"

*6+" O cwgtu'eqpegtpkpi 'yj g'hkuecn'{ gctu'qh'eqpuqnkf cvgf 'uwdukf kctkgu''

*7+" P qvgu"qp"ceeqwpvkpi "r qrkekgu"

*k+" Dcuku'cpf 'o gyj qf 'qh'xcnwcvkqp''qh'o clqt''cuugvu<

*c+" Dcuku'cpf "o gyj qf "qh'xcnwcvkqp"qh'ugewtkxkgu<"

Dqpf u'\q'dg"j grf '\q'o cwtkv{<"

Cv'co qtvk gf 'equv'*uvtcki j √nkpg'o gyj qf +"

Uwdukf kctkgu)'uvqem'cpf 'chhkrkcvgu)'uvqem'.'

Cv'equv.'f gvgto kpgf "d{"vj g"o qxkpi "cxgtci g"

o gyj qf"

Qyj gt 'ugewt kukgu<'

 Vj qug'y kij 'o ctngv'xcnwg<' Cv'o ctngv'xcnwg. 'y j kej 'ku'f gvgto kpgf 'd{ 'vj g"

cxgtci g''qh''y g''emukpi ''o ctmgv'r tkegu''hqt''qpg'' o qpyj "rtkqt"vq"yj g"enqug"qh"yj g"hkuecn'{gct0' Tgxcnvcvkqp"fkhhgtgpegu"ctg"cm"vtcpuhgttgf"

fktgevn{'vq'pgv'cuugw0'

Ces wkukkqp"equvu."y j kej "uj cm'dg"eqo r ctgf " y kj "o ctngv"xcnvg."ctg"f gvgto kpgf "d{"vj g"

o qxkpi "cxgtci g"o gyj qf . "kp"r tkpekr ng0"

Cv'equv."f gvgto kpgf "d{"vj g"o qxkpi "cxgtci g" Vj qug'y kj qw'o ctmgv'xcnwg<'

o gyj qf "

*d+" Dcuku'cpf "o gyj qf "qh'gxcnwcvkqp"qh'kpxgpvqtkgu<"

Cv"equv."f gvgto kpgf "d{"vj g"i tquu"cxgtci g"

o gyj qf. "kp"r tkpekr ng"

Vj g"dcmpeg"uj ggv"xcnwgu"ctg"ecnewncwgf "d{" yj g"y tkwg/f qy p"o gyj qf "dcugf "qp"f genkpgf "

o cti kpu0'

*e+" Dcuku'cpf "o gyj qf "qh'gxcnxcvkqp"qh'f gtkxcvkxgu<"

Cy'o ctngy'xcnwg"

*kk+" Ogyj qf "qh"fgrtgekcvkqp"qh"korqtvcpv"fgrtgekcdng"cuugvu<"

*c+" Vcpi kdrg'hkzgf 'cuugvu'' "

D{"yi g"uvtcki j √nkpg"o gyj qf."kp"r tkpekr ng" *gzenwfkpi 'ngcug'cuugvu+<'

*d+" Kovepi kdrg"hkzgf "cuugvu"

D{"yj g"uxtcki j \sqrt{nkpg" o gyj qf ."kp" r tkpekr ng=" *gzenwfkpi 'ngcug'cuugvu+<''

rtqxkfgf." j qy gxgt." yj cv" uqhwy ctg" hqt" kpvgtpcn'wug'ku'co qtvk gf 'd{'vj g'uvtcki j √nkpg" o gyj qf " qp" yj g" guvko cvgf " wughwn' nkhg" qh"

kpvgtpcn'wug'*hkxg"{gctu+0'

D{" yig" uvtckij √nkpg" o gyjqf " qp" yig" *e+" Ngcug'cuugvu<"

> cuuwo r vkqp'yi cv'yi g'hgcug'r gtkqf 'ku'yi g'wughwn' nkhg'qh'vj g'r tqr gtv{ "cpf 'vj g'tgukf wcn'xcnwg'ku"

gtq"

Kp"cffkkqp.'hkpcpeg'hgcug'tcpucetkqpu'y j kej " f q"pqv" vtcpuhgt "qy pgtuj kr. "hqt" y j kej " yj g"

/"63"/"

eqo o gpego gpv'f cvg''qh'vj g''vtcpucevkqpu''y cu'' O ctej '' 53.'' 422: '' qt'' vj gtgvqhqtg.'' cp'' ceeqwpvkpi ''o gyj qf ''uko krct''vq'vj g''o gyj qf 'hqt'' qtf kpct { ''ngcug''vtcpucevkqpu''ku''crrnkgf 0'

*kkk#" Dcuku'hqt'ceeqwpvkpi 'hqt'ko rqtvcpv'cmqy cpegu'cpf 'tgugtxgu<"

*c+" Cmy cpeg'hqt'f qwdvhwn'ceeqwpwk'

Vq" o ggv' nquugu" htqo " nqcp" f ghcwm." yi g" Eqo r cp{" ugwi" cukf g" cp" gurko cvgf " wpeqngevkdng" co qwpv." d{" vcnkpi " kpvq" eqpukf gtcvkqp"yi g"cewcn'nquu'tcvg"kp"tgur gev' qh" i gpgtcn' etgf kwi" cpf " yi g" kpf kxkf wcn' r quukdkrkkgu" qh" eqngevkqp" kp" tgur gev' qh" ur gekhke" encko u." uwej " cu" r tqdcdng" pqp/ r gthqto kpi "etgf kw0'

*d+" Cmy cpeg'hqt'dqpwugu<"

Vq" o ggv' yj g" r c { o gpv' qh' dqpwugu" vq" go r mq { ggu." yj g" Eqo r cp { " ugvu" cukf g" yj g" r qt kqp" hqt" yj g" eqpuqrkf cvgf " hkuecn' { gct" wpf gt" t gxkgy " qh" cp" guvko cvgf " co qwpv' qh" dqpwugu' vq" dg'r ckf 'kp' yj g'hwwt g0'

*e+" Tgugtxg"hqt"tgrckt"y qtmı<"

Vq"o ggv'y g"r c {o gpv'hqt"tgr ckt "gzr gpugu"kp" y g" hwwtg." y g" Eqo r cp {" ugvu" cukt g" y g" r qtvkqp" hqt" y g" eqpuqutt cvgf " hkuecn' {gct" wpf gt "tgxkgy "qh"cp"co qwpv'qh"gzr gpugu"qh" kpur gevkqp" cpf " tgr ckt" vq" dg" f ghtc {gf " kp" tgur gev'qh"y g"qkn'vcpmu"cpf "o cej kpgt {"cpf" gs vkr o gpv'cpf "xguugnu"y cv'tgs vkt g"r gtkqf ke" tgr cktu'kp'y g'hwwtg0'

*kx+" O gyj qf "qh'ko r qt vcpv'j gf i g'ceeqwpvkpi "

*c+" O gyj qf "qh"j gf i g"ceeqwpvkpi <"

F ghgttch'j gf i g'ceeqwpvkpi 'ku'cr r nkecdng0'

*d+" J gf i kpi 'kpuvtwo gpvu'cpf 'j gf i gf 'kvgo u<"

J gf i kpi "kpurtwo gpvu<"

Hqty ctf" gzej cpi g" eqpvtcevu." hqtgki p" ewttgpe{" f gdvu" r c{cdrg." ewttgpe{" qr vkqp" vtcpucevkqpu." etwf g" qkri' cpf" r gvtqrgwo " r tqf wevu" uy cr " vtcpucevkqpu." hwwwtgu" vtcpucevkqpu."kpvgtguv'tcvg"uy cr u."kpvgtguv'tcvg" cpf "ewttgpe{"uy cr u."cpf "qr vkqp"\tcpucevkqpu0'

J gf i gf 'kvgo u≺'

Hqtgki p"ewttgpe{"tgegkxcdrgu"cpf "r c{cdrgu." hqtgki p"ewttgpe{"kpxguvo gpv'ugewtkkgu."etwf g" qkricpf "r gvtqrgwo "r tqf wevu."gs wkv{ 'kpvgtguvu'kp" qxgtugcu'uwdukf kctkgu'cpf "f gdvu'r c{cdrg0' "

*e+" J gf i kpi 'r qrke {<"

Vj g"Eqo r cp{"cpf "uqo g"qh"ku"eqpuqrkf cvgf " uvdukf kctkgu." kp" ceeqtf cpeg" y kj " vj gkt"

/'64''/''

tgur gevkxg"twrgu."ectt {"qwv"j gf i g"vtcpucevkqpu" y kij kp" vj g" ueqr g" qh" cewcri" tgs wktgo gpwu" vq" j gf i g"tkurn'qh"r tkeg"ej cpi gu. "kpvgtguv'tcvg"cpf " ewttgpe {" hrwewcvkqpu" y kij " tgi ctf " vq" vj g" j gf i gf 'kvgo u0'

*f+" O gyj qf "qh"gxcnxcvkpi "yj g"ghhgevkxgpguu"qh"c"j gf i g<"

Vj g'o gyi qf 'qh'gxcnxc\kpi ''y g'ghhge\kxgpguu'qh' c"j gf i g''ku''\q''eqphkto ''yi g''eqo r nkcpeg''qh''yi g'' j gf i kpi ''kpuxtwo gp\u''y kyj ''yi g''j gf i gf ''k\go u0' '' P q''gxcnxc\kqp''ku''o cf g''cu''\q''yi g''ghhge\kxgpguu'' qh'' cp{" \utcpuce\kqp'' kp" y j kej " \uto r qt\cp\u'' eqpf k\kqpu''ctg''eqo o qp''hqt''yi g''j gf i gf ''cuug\u'' cpf ''nkcdkt\k\gu''qt''\uej gf \uxoftygf ''\utocuce\kqpu''cpf '' r t\egy ej cpi gu'' qt'' ecuj " \underset hqp\u''epi gu'' ctg'' cuuwo gf ''\underset kcpeg''\underset \underset qhu\ugy''\underset qp''\underset g'' eqo o gpego gp\u''qh''\underset g'' j gf i \underset kpi ''cpf ''eqp\underset kp\ugy'' \underset q'' \underset g'' g'' gf i \underset kpi ''cpf ''eqp\underset kp\ugy'' \underset q'' g'' gf j gf i \underset kpi ''cpf ''eqp\underset kp\ugy'' \underset q'' g'' gf gf i \underset kpi ''cpf ''eqp\underset kp\ugy'' \underset q'' g'' gf j gf i \underset kpi ''cpf ''eqp\underset kp\ugy'' \underset g'' g'' gf j gf i \underset kpi ''cpf ''eqp\underset kp\ugy'' \underset kp\ugy ''y g'' gf gf j gf i \underset kpi ''cpf ''eqp\underset kp\ugy ''y g'' gf gf j gf i \underset kpi ''cpf ''eqp\underset kp\ugy ''y g'' gf gf j gf i \underset kpi ''cpf ''eqp\underset kp\ugy ''y g'' gf gf j gf i \underset kpi ''cpf ''eqp\underset kp\ugy ''y g'' gf gf j gf i \underset kpi ''cpf ''eqp\underset kp\ugy ''y g'' gf gf j gf i \underset kpi ''cpf ''eqp\underset kp\ugy ''cpf ''cpf ''eqp\underset kqp\underset kp\underset g'' \underset kqp\underset kqp\underset kqp\underset g'' \underset kqp\underset kqp

*x+" Co qt vk cvkqp"qh'i qqf y km<"

I qqf y km'ku'co qt√k gf 'wukpi ''y g'uvtcki j √nkpg''o gyj qf ''qxgt''y g''guvko cvgf ''wughwn'nkhg''qh'' i qqf y km'*hkxg''{ gctu+0'

*xk+" Qyi gt"ko rqtvcpv"o cwgtu"hqto kpi "yi g"dcuku"qh"rtgrctcvkqp"qh"eqpuqrkf cvgf "hkpcpekcn" uvcvgo gpvu<"

*c+" Dcuku'qh''\tcpurc\kqp"qh''cuug\u''cpf ''kcdkrk\kgu''f gpqo kpc\vgf 'kp'hqtgki p''e\uttgpekgu''kp\vq'' y g''Icr cpgug''e\uttgpe{<"

Hqtgki p"ewttgpe{"tgegkxcdrgu"cpf"rc{cdrgu"ctg"tcpurcygf"kpvq"Lcrcpgug"{gp"cv''yi g"urqv''tcvg"rtgxckrkpi "qp"yi g"eqpuqrkf cvgf "dcrcpeg" uj ggv''fcvg"cpf "vcpurcykqp"fkhrgtgpegu"ctg"vgcvgf "cu"ickpu"cpf "muugu0' "Cuugwu"cpf "kcdkrkkgu"qh"qxgtugcu"uwdukfkctkgu"ctg"vcpurcygf "kpvq"Lcrcpgug"{gp"cv''yi g"urqv''tcvg"rtgxckrkpi "qp"yi g"eqpuqrkf cvgf "dcrcpeg"uj ggv''fcvg0' "Kpeqo g"cpf "gzrgpugu"ctg"vtcpurcygf"kpvq"Lcrcpgug"{gp"cv'yi g"cxgtci g"tcvg"hqt"yi g"rgtkqf"cpf"vtcpurcykqp"fkhrgtgpegu"ctg"kpenwfgf"kp"vtcpurcykqp"fkhrgtgpegu"ctg"kpenwfgf"kp"vtcpurcykqp"fkhrgtgpegu"ctg"kpenwfgf"kp"vtcpurcykqp"fkhrgtgpegu"ctg"kpenwfgf"kp"vtcpurcykqp"flwuvogpvu"cpf"pqpeqpvtqrrkpi "kpvytguvu"wpfgt"yi g"pgv''cuugwu"ugevkqp"qp"yi g"eqpuqrkfcvgf"dcrcpeg"uj ggv0'

*d+" Dcuku'qh'ceeqwpvkpi 'hqt'hkcdkrkv{ 'hqt'go r m{ggu)'tgvktgo gpv'dgpghkuv'

Vq'o ggv'y g'r c{o gpv'qh't gwt go gpv'dgpghku'vq'' go r m{ggu.'y g'Eqo r cp{'r tqxkf gu'cp'co qwpv'' qdvckpgf "d{"f gf wewpi "y g"co qwpv''qh''r ncp'' cuugw'' htqo "tgwt go gpv'' dgpghkv'' qdrki cwqpu.'' dcugf "qp"y gkt "t gur gewx g"guwo cvgf "co qwpw'' cu''qh''y g"gpf "qh'y g"eqpuqrkf cvgf "hwecn'{gct"

wpf gt"tgxkgy ."cu"c"nkcdkrkv{"hqt"go r mq{ggu)"
tgvktgo gpv'dgpghkvu0'

Cewctkcn'f khretepegu'ctg''tgcvef 'cu''gzr gpugu."
dcugf " qp" yi g" uvtcki j v" rkpg" o gyi qf " hqt" c"
ur gekhle" r gtkqf " qh" {gctu" *vgp" {gctu+" pqv'
gzeggf kpi " yi g" cxgtci g" tgo ckpkpi " {gctu" qh'
ugtxkeg"qh"go r mq {ggu."htqo "yi g"eqpuqrkf cvgf "
hluecn' {gct"pgzv'hqmqy kpi " yi g"eqpuqrkf cvgf "
hluecn' {gct"y j gp'uwej "f khretepegu'qeewt0'
Rtkqt" {gct" ugtxkeg" rkcdkrkkgu" ctg" vtgcvgf " cu'
gzr gpugu" kp" c" nwo r" uwo " f wtkpi " yi g"
eqpuqrkf cvgf "hluecn' {gct "y j gp'uwej "rkcdkrkkgu"
qeewt0'

Wptgeqi pk gf " cewctkcn' f khtgtgpegu." chwgt" cf lwurkpi " hqt" vczgu." ctg" tgeqi pk gf " cu" c" tgyktgo gpy'dgpghky'nkcdkrk/{ "cf lwuro gpy'wpf gt" ceewo wrcygf "qy gt"eqo rtgj gpukxg"kpeqo g"kp" yj g'pgy'cuugwl'ugeykqp0'

*e+" Ceeqwpvkpi "vtgcvo gpv'qh'f ghgttgf "cuugvu<"

Dqpf "kuuwcpeg" gzr gpugu" cpf "uvqem' kuuwcpeg" gzr gpugu" ctg" cm' vtgcvgf "cu" gzr gpugu" wr qp" rc{o gpv'yi gtgqh')'

*f+" Ceeqwpvkpi "ttgcvo gpv"qh"eqpuwo r vkqp"\czgu."gve0\"

Eqpuwo r wlqp" wzgu" cpf " mecn' eqpuwo r wlqp" wzgu'ctg"gzenwf gf 'htqo "gcej "ceeqwpv'uwdlgev' vq'uwej "wzgu0'

*g+" Qkrlhkgrf "r t go kwo "cuugvu"cpf "rkcdkrkkkgu<"

Y ky "tgi ctf" vq" rtgo kwo u" rc{cdrg" vq" y g" cuuki pgt"qh'y g"Upqttg"o kpkpi "rqv'r wtuwcpv'vq" y g"ci tggo gpv'gpvgtgf 'kpvq'wr qp"y g'r wtej cug" qh'y g'o kpkpi "rqv.'y g"Eqo rcp{"j cu"guvko cvgf" cp"co qwpv'vq"dg"rc{cdrg"kp"y g"hwwtg"dcugf" qp"y g"etwf g"qkritgugtxgu"cpf "etwf g"qkrithwwtgu" rtlegu" vq" tgeqi pkt g" cp" co qwpv' chrgt" f gf wevkqpu'cu'qkrithkgrf "rtgo kwo "hcdkrkkkgu'cpf" y g"uco g"co qwpv'cu"qkrithkgrf "rtgo kwo "cuugwu" uko wrcpgqwun{0" Qkrithkgrf "rtgo kwo "cuugwu" y krri'dg"f grtgekcvgf "kp"rtqrqtvkqp"vq"y g"{kgrf" cpf" qkrithkgrf" rtgo kwo "cuugwu" y krri'dg"f grtgekcvgf "kp"rtqrqtvkqp"vq"y g"{kgrf" cpf" qkrithkgrf" rtgo kwo "rkcdkrkkgu" y krri' dg" ceetwgf "kp"y g"cewcri'co qwpv'qh'rc{o gpv0'

*8+" Ej cpi g'kp"ceeqwp\kpi "r qrkekgu"

P qv'cr r rlecdrg"

*9+" Ej cpi g'kp'r tgugpvckqp'o gyj qf u"

P qv'cr r rkecdrg"

'

"

*: +" Ej cpi g'kp''ceeqwpvkpi ''guvko cvgu''

P qv'cr r rlecdrg"

40' P qvgu'vq'vj g'eqpuqnkf cvgf 'dcrcpeg'uj ggv'

*3+" Cuugwi'r rgf i gf "cpf "eqttgur qpf kpi "rkcdkrkskgu"

Cuugwi'r ngf i gf "

* k +"	Heevqt { 'hqwpf cwlqp'o qtvi ci g<'	"
"	Nepf "	Ø559.; 85"o kmkqp"
*kk+"	Qyjgt"rngfigu<"	"
"	Kpx guvo gpv'uge wtkkkgu"	Ø .2: : "o kmkqp"
"	Vqvcn''	Ø568.273"o kmkqp"

 $\label{thm:complex} \begin{tabular}{ll} $\tt Kp"cffkkqp"vq"vj\ g"cdqxg."vj\ g"Eqo\ r\ cp{"r\ ngfi\ gf"kpxguvo\ gpv'ugewtkkgu"kp"Pij k'Uqp" Tghkpgt{"cpf"Rgvtqej\ go\ kecn'NNE"*$PUTR$+."co\ qwpvkpi"vq"Ø14.894"o\ knkqp"cpf"nqpi/vgto "mcpu"tgegkxcdng"htqo "PUTR."co\ qwpvkpi"vq"Ø14.973"o\ knkqp."cu"eqmcvgtcn'hqt" PUTR)u''dqttqy kpi u'htqo 'hkpcpekcn'kpvvkwvkqpu0' \\ \end{tabular}$

Nkcdkrkskgu'y ky "cuuguu'r ngf i gf "

"

"	Hocevert { "Inqweef cykep" o qt vi ci g<"	

Ceeqwpw'r c{cdrg/qyi gt"	Ø86.796"o kmkqp"
Vqvcn'	Ø86.796"o kmkqp"

 $\label{eq:comparison} Vj \ g"ceeqwpuu"r \ c \ \{ cdng/qvj \ gt "y \ gtg"tgncvgf "vq"r \ c \ \{ o \ gpv'qh'i \ cuqnkpg"vcz0" \ "" \ c \ gnv'qh'i \ cuqnkpg"vcz0" \ "" \ c \ gnv'qh'i \ cuqnkpg"vcz0" \ "" \ c \ gnv'qh'i \ c \ gnv'qh'i$

Kp"cf f kklqp"\q"\j g"cdqxg."cnj qwi j "\j g"hce\qt { "hqwpf c\lqp"y cu'uwdlge\gf "\q"c" tgxqrxkpi "o qtvi ci g"tgrc\gf "\q"dcpm\tcpuce\lqpu."\j gtg"y gtg"pq"uwdu\cp\kcn'nkcdkrk\lgu" y kj "cuug\u"r rgf i gf 0'

*4+" Ceewo wrcvgf "f gr t gelcvkqp"qh"vcpi kdrg"hkz gf "cuugvu" Ø4.367.644"o kmkqp"

*5+" Eqpvkpi gpv'rkcdkrkvkgu"

"	I wctcpvgg"qh"qdrki cvkqpu"	Ø82.; 2; "o knkqp"
"	O cpci go gpv'f ktgevkxg"o go qtcpf wo u"	Ø75"o kmkqp"
"	Eqpurt werkqp"eqor rgrkqp"i wetcpvgg"	Ø886.798"o krrkgp"
"	Vqvcn''	Ø397.75; "o kmkqp"

*6+" Ncpf "tgxcnwcwlqp"

 $\label{eq:control_problem} \begin{tabular}{ll} $K_p''' ceqtf cpeg''y k j ''y g''Ncpf 'Tgxcnwc kqp''Cev'' Cev''P q0'56.''r tqo wi cvgf ''qp''O ctej ''53.'' 3; ; : +''qh''Lcr cp''cpf ''y g''Cev''q''Co gpf ''Rctv'qh''y g''Ncpf ''Tgxcnwc kqp''Cev'''Cev''P q0'3; .'' r tqo wi cvgf ''qp''O ctej ''53.''4223+''qh''Lcr cp.''y g''Eqo r cp{}u'''rcpf ''wugf ''hqt''dwukpguu''ku'' } \end{tabular}$

"

tgxcnwcvgf "cpf "cp" co qwpv' gs wkxcrgpv' vq" vcz gu" qp" yj g"f kthgt gpeg" qp" tgxcnwcvkqp" ku" kpenwf gf "kp"nkcdkrkvkgu"cu"\$f ghgt tgf "vcz "nkcdkrkvkgu"wr qp" tgxcnwcvkqp\$"cpf "vj g'f kthgt gpeg" qp" tgxcnwcvkqp"o kpwu"yj g"co qwpv'qh'uwej "vcz gu'ku'kpenwf gf 'kp"pgv'cuugvu'cu'\$tgxcnwcvkqp" f kthgt gpeg"qh'ncpf \$0'

*k+" Ogyj qf "qh"tgxcnwcvkqp<"

Ncpf "tgxcnwc\dp"ku"o cf g"kp"ceeqtf cpeg"y kj "y g"o gy qf qh"ecnewc\dp"d{"o cnkpi" tgcuqpcdrg"cf lwwo gpwl"q"y g"cuuguugf "xcnwg"qh"hzgf "cuugwl"cu"ugv"hqty "kp"Ct\kerg"4." kgo "5"qh"y g"Qtf kpcpeg"\q"Ko r rgo gpv"y g"Ncpf "Tgxcnwc\dp"Cev"*Ecdkpgv'Qtf gt"P q0' 33; ."rtqo wi cvgf "qp"O ctej "53."3; ;: ="\y g"\Qtf kpcpeg\+."\y g"o gy qf qh"ecnewc\dp"d{" o cnkpi "tgcuqpcdrg"cf lwwo gpwl"vq"y g"rcpf "xcnwgu"y cv'hqto "y g"dcuku"qh"rcpf "vcz" ecnewc\dppu"cu"ugv'hqty "kp"Ct\kerg"4."kgo "6"qh"y g"Qtf kpcpeg."cpf "crrtckucnu"d{"tgcn' gwcyg"crrtckugtu"cu"ugv'hqty "kp"Ct\kerg"4."kgo "7"qh"y g"Qtf kpcpeg0'

*kk+" Tgxcnvcvkqp'fcvg<"

Octej '53.'4224"

*kkk:" F khogt gpeg "qh'yi g "o ctnogv'xcnwg "cv'yi g "gpf "qh'yi g "eqpuqnkf cvgf 'hkuecn' { gct 'wpf gt 't gx kgy " qh'yi g 'hcpf 't gx cnwc vkq p < ' g g dqqnh'x cnwg 'yi gt gqh'ch yt 'uwej 't gx cnwc vkqp < '

\$\\D866.497\"o kmkqp+\"

50' P qvgu'vq'vj g'eqpuqnkf cvgf 'uvcvgo gpvu'qh'kpeqo g''

Nquu'qp"tcpukkqp"\q'f ghkpgf "eqpvtkdwkqp"r gpukqp"r rcp"

Vj g'Eqo r cp{ "tcpuhgttgf "cmqy cpegu"r tgxkqwun("r tqxkf gf "cu"c"r ctv'qh"go r mq{ggøu" eqo r gpucvkqp"r cenci gu"vq"c"f ghkpgf "dgpghku"r gpukqp"u{uvgo "kp"vj g"eqpuqnkf cvgf "hkuecn" {gct"wpf gt"tgxkgy "cpf "tcpukxkqpgf "vq"c"f ghkpgf "eqpvtkdwkqp"r gpukqp"u{uvgo "ghhgevkxg" Cr tkn"3."423: 0" "Vj g"nquugu"f wg"vq"vj ku"vtcpukxkqp"ctg"tgeqtf gf "cu"gzvtcqtf kpct {" gzr gpugu0'

60' P qvgu'vq''yi g''eqpuqnkf cvgf ''uvcvgo gpv'qh''uj ctgj qrf gtu)''gs wkv{.''gve0'

*3+" O cwgtu'eqpegtpkpi 'vj g'vqvcn'pwo dgt'qh'kuwgf 'vij ctgu'

Ercuu'qh' uj ctgu''	P wo dgt "qh'uj ctgu"cu qh'Cr tkri3."4239"	Kpetgcug'kp'vjg'' pwo dgt''qh'uj ctgu'' f wtkpi 'vjg''{gct''	F getgcug'kp'vj g" pwo dgt"qh'uj ctgu" f wtkpi 'vj g"{gct"	P wo dgt ''qh''uj ctgu'' cu''qh''O ctej ''53." 423: "
Uj ctgu'qh'	382.222"yj qwucpf"	6: .222"yj qwucpf "	/!!	42: .222"yj qwucpf "
eqo o qp'uvqe	em' uj ctgu"	uj ctgu"	/	uj ctgu"

*P qvg+" Vj g"vqvcn'pwo dgt"qh''kuuwgf "uj ctgu''kpetgcugf "d{ "6: .222" yj qwucpf "uj ctgu''cu''c" tguwn/'qh''yj g" ecr kxcn'kpetgcug''yj tqwi j ''r wdrke "qh'ngtkpi 0'

*4+" O cwgtu'eqpegtpkpi 'yj g'pwo dgt'qh'uj ctgu'qh'utgcuwt { 'uvqem'

Ercuu'qh' uj ctgu"	P wo dgt ''qh''uj ctgu''cu qh''Cr tkri'3.''4239''	Kpetgcug'kp''y g" pwo dgt''qh''uj ctgu'' f wtkpi ''yj g''{ gct''	F getgcug'lp'\j g" pwo dgt'qh'uj ctgu" f wtlpi '\j g''{ gct"	P wo dgt "qh"uj ctgu" cu"qh"O ctej "53." 423: "
Uj ctgu'qh' eqo o qp'uvqem'	69"yj qwwpf" uj ctgu"	2"yj qwucpf 'uj ctgu"	/"	69''y qwwcpf" uj ctgu"

*P qvg+" Vj g"pwo dgt"qh'uj ctgu'qh''vtgcuwt { "uvqem'kpetgcugf "d { "2" yj qwucpf "uj ctgu'cu''c "tguwny'qh''yj g" uj ctgj qrf gtu)'tgs wguwi'hqt'r wtej cugu'd { "yj g'Eqo r cp { "qh'hguu/ yj cp/qpg/wpky'uj ctgu0'

*5+" O cwgtu'eqpegtpkpi 'yj g'f kwtkdwkqp"qh'tgvckpgf "gctpkpi u"

*k+" Co qwpv'qh'r c{o gpv'hqt'f kxkf gpf u."gve0\"

O cwgtu"eqpegtpkpi "vj g"f kxkf gpf u"f gwgto kpgf "d{"tguqnwkqp"cv'vj g"o ggwkpi "qh'vj g" Dqctf "qh'F ktgevqtu"j grf "qp"O c{"37."4239<"

• " Ci i tgi cvg"co qwpv'qh'f kxkf gpf u" Ø5.; ; : "o kmkqp"

• " Co qwpv'qh'f kxkf gpf 'r gt 'uj ctg" Ø47"

" Tgeqtf 'f cvg" Octej '53.'4239"
 " Ghgevkxg'f cvg" Lwpg": .'4239"

O cwgtu'eqpegtpkpi ''y g'f kxkf gpf u'f gwgto kpgf ''d{ ''tguqnwkqp''cv''y g''o ggwpi ''qh''y g'' Dqctf ''qh'F ktgevqtu'j grf ''qp'P qxgo dgt''36.''4239<''

• " Ci i tgi cvg"co qwpv'qh'f kxkf gpf u" Ø .53: "o kmkqp"

• " Co qwpv'qh'f kxkf gpf 'r gt 'uj ctg" Ø62"

• " Tgeqtf "f cyg" Ugr wo dgt "52."4239"

• " Ghlgevkxg"f cvg" F gego dgt '9. "4239"

*kk+" F kxkf gpf u"hqt"y j kej "vj g"tgeqtf "f cvg"hcmu"f wtkpi "vj g"eqpuqrkf cvgf "hkuecn' { gct "wpf gt" tgxkgy "dwv'j g"ghgevkxg'f cvg'hcmu'f wtkpi "vj g"pgzv'eqpuqrkf cvgf 'hkuecn' { gct <"

Vj g'hqmqy kpi "o cwgtu'y gtg'f gvgto kpgf "d{"tguqnwkqp"cv'yj g'o ggvkpi "qh''y g'Dqctf" qh'F ktgevqtu'j grf "qp'O c{"37."423: <"

• " Ci i tgi cvg"co qwpv'qh'f kxkf gpf u" Ø .53: "o kmkqp"

• " Co qwpv'qh'f kxkf gpf 'r gt'uj ctg" Ø62"

• " Tgeqtf 'f cvg" Octej '53.'423: "
• " Ghgevkxg'f cvg" Lwpg'9.'423: "

70' P qvgu'qp'hkpcpekcn'kpuvtwo gpvu"

*3+" O cwgtu't grc kpi '\q'\j g'uvcwu'qh'hkpcpekcn'kpuvt wo gpvu"

Vj g''I tqwr "tckugu"tgs wktgf "hwpf u"*r tkpekr cm{ "d{"dcpm'rqcpu"cpf "vj g"kuuwcpeg"qh'dqpf u+" ceeqtf kpi "vq"r rcpv'cpf "gs wkr o gpv'r rcpu0' "Vj g''I tqwr "kpxguvu"vgo r qtct{"uwtr nwu"hwpf u"kp" j ki j /ugewtkv{ 'f gr quku"cpf 'qvj gtu"cpf 'tckugu"uj qt√vgto "qr gtcvkpi 'hwpf u'vj tqwi j 'dcpmllqcpu" cpf "eqo o gtekcn'r cr gtu0'

Vj g"I tqwr "wkrk gu"f gtkxcvkxgu"vq"o kki cvg"tkum'tgrcvkpi "vq"ku"cewcn'tgs vktgo gpvu"cpf "gpi ci gu'kp''pq''ur gewrcvkxg''vtcpucevkqp0'

Vq"tgf weg"erlepvu)"etgf kl"tkumu"tgrcvkpi "vq"pqvgu"cpf "ceeqwpvu"tgegkxcdrg/vtcf g. "vj g"I tqwr " j cu"uvkr wrcvgf "ku"etgf kl"o cpci go gpv"twrgu"cpf "etgf kl"ucrgu"o cpci go gpv"twrgu0' " Y kj " tgi ctf "vq"kpxguvo gpv"ugewtkkgu. "y j kej "ctg"r tkpekr cm{"uvqemu"qh"erkgpv"eqo r cpkgu"y kj " y j kej "vj g"I tqwr "j cu"dwukpguu"vkgu. "vj g"o ctnrgv"r tkegu"qh"rkuvgf "uvqemu"ctg"tgeqi pk gf "hqt" gcej "s wctvgt"cpf "y kj "tgi ctf "vq"wprkuvgf "uvqemu. "vj g"hkpcpekcn"r qukkkqpu"qh"vj g"kuuvgtu"ctg" tgeqi pk gf "hqt"gcej "hkuecn"{gct0'

Y ký "tgi ctf "vq" hqtgki p" ewttgpe{"ceeqwpw"rc{cdrg/vtcf g"tgrcvkpi "vq" korqtwi"qh"tcy "o cvgtkcnı."ý g"I tqwr "wkrk gu'hqty ctf "gzej cpi g"eqpvtcewi"q"tgf weg'hqtgki p"ewttgpe{"tkm0'

Vq"cxgtv"kpvgtguv'tcvg"tkum'tgrcvkpi "vq"mpi/vgto "mqcpu"r c{cdrg."vj g"I tqwr "gpi ci gu"kp" kpvgtguv'tcvg'uy cr u'cpf 'hkzgu'kpvgtguv'gzr gpugu0' "Kp'cf f kkdqp."vq'tgf weg'o ctngv'tkum'tgrcvkpi "vq"etwf g"qkn'cpf "r gvtqrgwo "r tqf wevu."vj g"I tqwr "gpi ci gu'kp"r tqf wev'uy cr "vtcpucevkqpu"cpf "hwwtg'vtcpucevkqpu0'

Vj g"I tqwr "gpi ci gu"kp"f gtkxcvkxgu"cm'kp"ceeqtf cpeg"y kyj "vj g"r qrke{"cr r tqxgf "hqt"gcej "hkuecn'{gct'dcugf "qp'kxu'kpvgtpcn'vtcf kpi 'twrgu'cpf 'y kyj kp'cewcn'tgs wktgo gpvu0'

*4+" O cwgtu'eqpegtpkpi 'ewttgpv'xcnwgu. 'gve0'qh'hkpcpekcn'kpuvtwo gpwi'

Vj g" hqmqy kpi " ej ctv" uj qy u" vj g" eqpuqnkf cvgf " dcrcpeg" uj ggv" co qwpvu" qh" hkpcpekcn" kpuvtwo gpvu"cu"qh"O ctej "53."423: ."cmpi "y kj "vj gkt"ewttgpv"xcnwgu"cpf "vj g"xctkcpegu<"

*o kmkqp" { gp+" Eqpuqrkf cvgf " dcmpeg'uj ggv' Ewttgpv'xcnwg" Xctkcpeg" co qwpv" ::.646" ::.646" *3+" Ecuj 'cpf 'f gr qukv' 6: 8.3: 7" 6: 8.3: 7" *4+" Pqvgu'cpf 'ceeqwpw'tgegkxcdrg/vtcfg" 42: .834" 42: .554" *4: 2+" *5+" "Kpxguvo gpv'ugewtkkgu" 78.56: " 78.56: " *6+" "Nqpi/vgto "mqcpu"tgegkxcdmg" : 5; .792" : 5; .4: ; " *4: 2+" Vqvcn'cuugvu'' 64; .772" 64; .772" *3+" "P qvgu'cpf "ceeqwpvu'r c{cdrg/vtcf g" 364.: 95" 364.: 95" *4+" "Uj qt√vgto "dqttqy kpi u" 35: .223" 35: .223" *5+" "Eqo o gteken'r er gtu" 47.222" 47.222" *6+" "Ewttgpv'r qt wkqp"qh'dqpf u" 62.222" 62.576" 576" *7+" "Dqpf u" 768.393" 76: .2; 7" 3.; 45" *8+" "Nqpi /vgto "f gdv" 3.543.7; 9" 3.545.: 97" 4.499" Vqvcn'rkcdkrkvkgu" *9.974+" *9.974+" F gtkxcvkxgu'*, +"

*P qvg+" O cwgtu" eqpegtpkpi " yi g" ecnewrcwkqp" o gyi qf " qh" yi g" ewttgpv" xcnwgu" qh" hkpcpekcn' kpuntwo gpwu. "cu'y gm'cu'ugewtkxkgu"cpf "f gtkxcvkxgu≺"

Cuugw<

*3+" Ecuj "cpf "f gr qukv"

Vj g'dqqm'xcnwg'ku'wugf 'hqt'f gr quku. 'cu''y g'ewttgpv'xcnwg'ku'pgctn{ 'gs wcn'\q'\y g'dqqm'xcnwg'' cu''c''tguwn'qh'\y gt''uj qtv'\gto u0'

*4+" P qvgu'cpf 'ceeqwpvu'tgegkxcdrg/vtcf g"

Vj g"dqqm'xcnwg"ku'wugf "hqt" vj gug"kygo u. "cu" vj g"ewttgpv'xcnwg"ku"pgctn{ "gs wcn'vq" vj g"dqqm' xcnwg"cu"c"tguwn/'qh' vj gkt'uj qtv'ugwngo gpv'r gtkqf u0'

^{*, +&}quot; P gv'tgegkxcdrgu'cpf 'r c {cdrgu'tguwnkpi 'htqo 'f gtkxcvkxgu'vtcpucevkqpu'ctg'r tgugpvgf 'qp'' pgv'dcug0' "Vj g'vqvcn'pgv'r c {cdrgu'ctg'r tgugpvgf 'kp'r ctgpyj gugu0'

*5+" Koxguvo gpv'ugewtkukgu"

Y kij "tgi ctf "vq"kpxguvo gpv'ugewtkkgu"y kij "o ctngv'xcnvg."vj g"ewttgpv'xcnvg"qh'uvqemu"ku" f gvgto kpgf "d{"vj g"r tkeg"vj gtgqh"vtcf gf "qp"cp"gzej cpi g0' "Hqt"dqpf u."vj g"xcnwg"ku" f gygto kpgf "d{"yj g"r tkeg"cppqwpegf "d{"yj g"Eqo r cp{)u"hkpcpekcn"kpuvkwykqpu0" "Wprkuygf" uj ctgu' *Ø435.: 46"o kmkqp+"vj cv'j cxg"pq"o ctngv'r tkeg"ctg"pqv'kpenxf gf "kp"vj g"cdqxg"vcdrg" cu'f gygto kpkpi "yj g"o ctngy'xcnwg"ku'tgeqi pk gf "cu'dgkpi "gz vtgo gn('f khhkewn0'

*6+" Napi/vgto 'nqcpu'tgegkxcdrg"

Vj g'ewttgpv'xcnwg'ku'ecnewncygf 'htqo 'vj g'r tgugpv'xcnwg'qh'vj g'hwwtg'ecuj 'hnqy 'f kueqwpygf'' cv'c'tcvg''uwr r qukpi ''c''uko krct''nqcp''ku''pgy n{ ''gzvgpf gf 0'

Nkcdkrkkkgu<

*3+" "P qvgu'cpf "ceeqwpw'r c {cdrg/vtcf g.'*4+"Uj qtv'vgto "dqttqy kpi u.'*5+"Eqo o gtekcn'r cr gtu."cpf " *6+'Ewttgpv'r qtvkqp"qh'dqpf u" "

Vj g'dqqm'xcnwg''ku'wugf ''hqt''vj gug''kygo u. "cu''vj g''ewttgpv'xcnwg''ku''pgctn("gs wcn'vq''vj g''dqqm' xcnwg'cu'c'tguwn/qh'vj gkt'uj qtv'ugwrgo gpv'r gtkqf u0'

*7+" Dqpf u"

Vj g'ewttgpv'xcnwg'ku'dcugf 'qp''yj g'o ctngv'r tleg0'

*8+" Nqpi/vgto "f gdv"

Vj g'ewttgpv'xcnwg'ku'ecnewrcygf 'htqo ''vj g'r tgugpv'xcnwg''qh'vj g''vqvcn'r tkpekr cn'cpf 'kpvgtguv' f kueqwpygf "cv"c"tcyg"uwr r qukpi "uko krct"dqttqy kpi u"ctg"pgy n{ "eqpf weygf 0"

<u>Fgtkxcvkxgu</u><"

"

Vj g'ewttgpv'xcnwg'ku'ecrewrcygf 'dcugf 'qp''yj g'hqty ctf 'gzej cpi g'tcyg. ''yj g'hwwtgu'r tkeg''cpf " yj g'r tkeg"cpf "qyj gt"kphqto cykqp"uj qy p"d{ "'yj g"Eqo r cp{)u"eqwpygtr ctykgu0"

80' P qvgu'qp't gcn'guvcvg'hqt'hgcug. "gve0'

*3+" O cwgtu't grcvkpi "vq'vj g'uvcwu'qh't gen'guvcvg'hqt 'hgeug. "gve0'

Vj g'Eqo r cp{ "cpf "uqo g"qh'kuu 'uwdukf kctkgu'r quuguu 'qhhkeg"dwknf kpi u'hqt 'ngcug. "qkn'uvqtci g" vcpmı. "eqo o gtekcn"guvcdrkuj o gpvu. "gve0"kpenvf kpi "rcpf +"kp"Vqm(q. "Qucmc"cpf "qvj gt"ctgcu" kp"Lcr cp"cpf "qxgtugcu0" "Hqt" y g"eqpuqrkf cvgf "hkuecn" {gct "wpf gt" tgxkgy . "y ky "tgi ctf "vq" tgcn"guvcvg"hqt"ngcug."gve0"kpeqo g"qp"ngcug"y cu"Ø455"o kmkqp"*ngcug"kpeqo g"cpf "ngcug" gzr gpugu'ctg'ceeqwpvgf 'hqt'kp'pgv'ucrgu'cpf 'ugmkpi .'i gpgtcn'cpf 'cf o kpkuvtcvkxg'gzr gpugu." tgur gevkxgn(.'kp'r tkpekr rg+.''nquu''qp''f kur qucn'cpf ''ucrgu''qh'hkzgf ''cuugvu''y cu''Ø3.669''o kmkqp'' *ceeqwpvgf "hqt"kp"gzvtcqtf kpct { "kpeqo glgzr gpugu+"cpf "ko r ckto gpv'nquu"qp"hkzgf "cuugvu" y cu'lØ6; 6"o kmkqp"*ceeqwpvgf "hqt'lkp"gzvtcqtf kpct { "gzr gpugu+0"

*4+" O cwgtu'eqpegtpkpi 'ewttgpv'xcnwgu. 'gve0'qh'tgcn'guvcvg'hqt'ngcug. 'gve0'

*o kmkqp"{gp+"

Eqpuqnkf cvgf "dcrcpeg"uj ggv'co qwpv'	Ewttgpv'xcnwg"
324.344"	: 7.88: "

*Pqvg'3+" Vj g"eqpuqnkf cvgf "dcrcpeg"uj ggv'co qwpv'ku"cp"co qwpv'qdvckpgf "d{"f gf wevkpi "htqo "vj g'ces wkukkqp"equv'vj g'ceewo wrcvgf "f gr t gekcvkqp"qh'vcpi kdrg'hkz gf 'cuugw' cpf "vj g'ceewo wrcvgf 'nquu'qp'ko r ckto gpv0'

*P qvg''4+" Vj g''ewttgpv''xcnwg''cu''cv''vj g''enqug''qh''vj g''eqpuqnkf cvgf ''hkuecn''{ gct ''wpf gt ''tgxkgy '' ku''cp''co qwpv''*kpenwf kpi ''cp{ ''cf lwuvo gpv'o cf g''wukpi ''kpf gzgu. ''gve0+"ecnewrcvgf '' d{ ''vj g''Eqo r cp{ ''r tkpekr cm{ ''kp''ceeqtf cpeg''y kj ''kwu''\$Tgcn''Guvcvg''Crrtckucn'' Uvcpf ctf u\$0'

90' P qvgu'qp'vj g'kphqto cvkqp'r gt'vj ctg"

3+" P gv'cuugwi'r gt 'uj ctg'{gp+<"

6.399062"

4+" P gv'kpeqo g'r gt''uj ctg''{gp+<"

: 67039"

*P qvg+" F knwgf 'pgv'kpeqo g'r gt'uj ctg'ku'pqv'ecnewrcvgf 'hqt''j g'eqpuqnkf cvgf 'hkuecn'{ gct''wpf gt'' tgxkgy ''dgecwug''pq'f knwkxg''uj ctgu''gzknv0'

: 0' P qvgu'qp''cuugv't gvkt go gpv'qdrki cvkqpu''

Cuugv'tgsktgo gpv'qdrki cskqpu'tgeqtf gf "qp" yj g"eqpuqrkf cvgf "dcrcpeg" uj ggv."

*3+" Uwo o ct{"qhi'vj g"cuugv'tgvktgo gpv'qdrki cvkqpu<"

Tgurkwrkqp"qdrki crkqpu"kp"eqppgerkqp"y kij "tgcrl'gurcrg"rgcug"ci tggo gpwl'y kij "tgi ctf "vq" rcpf "hqt"hcekrkrkgu"qh"ugtxkeg"urcrkqpu. "gzr gpugu"qh"tgo qxcrl'qh"qkrl'cpf "eqcrl'r tqf werkqp" hcekrkrkgu'wr qp"vgto kpcrkqp"qh"r tqf werkqp"qt"o kpkpi "tki j wl'cpf "qvj gt"ksgo u'ctg"tgcuqpcdn{" gurko cryf "cpf "tgeqtf gf"cu"cuugv'tgrktgo gpv'qdrki crkqpu0"

*4+" O gyj qf "qh"ecnewrcvkqp"qh"yj g"co qwpvu"qh"yj g"cuugv"t gvkt go gpv"qdrki cvkqpu<"

Vj g'r gtkqf u'r tqlgevgf 'r tkqt''vq'f ghtc{o gpv'ctg''dcugf ''qp.''y kj ''tgi ctf ''vq''ugtxkeg''uvcvkqpu." yj g''wughwrl'nkxgu''qh'r tkpekr cri'hcekrkvkgu''yj gtgqh''cpf ''y kj ''tgi ctf ''vq''qkri'f gxgrqr o gpv.''eqcn'' gwe0''o kpkpi ''nkxgu''htqo ''yj g''eqo o gpego gpv''qh''qr gtcvkqpu0' '' Crrnkecdrg''f kueqwpv''tcvgu'' tcpi g''htqo ''30'' ''vq''702' 0'

"

*5+" Ej cpi gu'l\p''\j g'\q\cn'co q\p\v'\qh'\\j g'\cuug\tg\ktgo gp\v'\qdr\ki c\kqpu'f \text{wtpi "\j g''eqpuqr\kf c\vgf "} h\kuecn'\{gct'\wpf gt'\tg\ktgy <"

	*o kmkqp"{gp+"
Dempeg"ev'dgi kppkpi "qh"{get"	9: .; ; 4"
Kpetgcugf "co qwpv'kp"eqppgevkqp"y kyj "vj g" ces wkukkkqp"qh"vcpi kdrg"hkzgf "cuugvu"	; ; "
Cflwwo gpw'd{"hcrug"qh"vko g"	4.9: 9"
F get gcugf "co qwpv'cu"c"t guww'qh'cuugv't gwt go gpv' qdrki cwqpu"	*5: 4+'
Kpetgcugf '*f getgcugf +'co qwpv'cu'c'tguwn'qh' ej cpi gu'kp'guwo cvgu'*ugg'P qvg'3+"	35; '
Qy gt "kpet gcugf" "f get gcugf +"co qwpv" "ugg" P qvg" 4+"	*52.3; : +'
Dcmpeg"cv"gpf "qh"{ gct "	73.659"

*P qvg''3+" F wtkpi "vj g"eqpuqnkf cvgf "hkuecn" { gct "wpf gt"tgxkgy ."vj g"Eqo r cp { "ej cpi gf "guvko cvgu"r tkpekr cm{ "dgecwug"kv'dgeco g"engct"vj cv'vj g"gzr gpugu"vq"dg" kpewttgf "wr qp"vgto kpcvkqp"qh"r tqf wevkqp"qt"o kpkpi "tki j wı"d{ "uqo g"qxgtugcu" eqpuqnkf cvgf " uvdukf kctkgu" y qwrf " kpetgcug" qt" f getgcug0' " Vj g" kpetgcugf " *f getgcugf +'co qwpv'eqo r tkugu"cp"kpetgcug'qh"Ø4.468"o knkqp"cpf "c"f getgcug'qh"Ø4.329"o knkqp"f wg'vq'vj g"cdqxgo gpvkqpgf "tgcuqp0'

*Pqvg''4+" \$Qvj gt "kpetgcugf "*f getgcugf +"co qwpv\$"y cu'i gpgtcvgf "r tkpekr cm{ "d{" vj g'ucrg''qh''qxgtugcu''eqpuqrkf cvgf ''uwdukf kctkgu0'

POP/EOPUONIF CVGF 'DCNCPEG'UJ GGV'' *Cu'qh'O ctej '53.'423: +"

	4 o*	mkqp"{gp+"
CUUGVU'	**	**
Ewttgpv'cugw≼'	**	; 85.6: 5''
Ecuj 'cpf 'f gr quk'	"	3: .9: 7"
P qvgu't gegkxcdrg/vtcf g"	"	429"
Ceeqwpwl'tgegkxcdng/wtcf g"	"	595.58; "
O gtej cpf kıg"cpf 'hkpkıj gf 'i qqf u"	"	47: .727"
Tey "o cygtken'epf "uwr r nkgu"	"	422.3; 2"
Rtgr clf "gzr gpugu"	"	5.229"
Uj qt√vgto "mcpu"tgegkxcdrg"	"	49.; 66"
Fghgttgf "vcz"cuugvu"	"	34.824"
Qyj gt "ewttgpv"cuugvu" "	"	8; .889"
Cmy cpeg'hqt'f qwdvhwi'ceeqwpuu"	"	*9; 9+
Hzgf 'ċungw≼'	**	3.627.369"
Vcpi klıg'lıkzgf 'cungwi'	**	: 26.837"
Dwkrf kpi u"	"	69.; 39"
Utvewtgu"	"	84.359"
Qkri'cpmi''	"	45.373"
O cej kpgt { "cpf "gs wkr o gpv"	"	9; .5; 2"
Xgj kengu'cpf "tcpur qtvcvkqp"gs wkr o gpv"	"	3.83: "
Vqqnı.'hwtpkwtg'cpf 'hkz wtgu''	"	7.59; "
Ncpf"	"	798.; 87"
Eqpurtwevkqp'kp'rtqitguu''	"	: .277"
Kpvepi klug'lhzgf 'euugwi'	**	33.549''
Ngcugj qrf 'tki j vu''	"	: .4: 7"
Uqhwy ctg"	"	4.869"
Qyj gt 'kpvcpi kdrg'hkzgf ''cuugvu''	"	5; 6"
Kpxguwo gpwi'cpf 'qyj gt 'cuugwκ' '	**	7:;.427''
Kpxguvo gpv'ugewtkukgu"	"	58.9: 2"
Kpxguvo gpvu'kp''uj ctgu''qh''chhkkcvgu''	"	673.284"
Napi/vgto 'macpu't geglacdrg''	"	36.3; 8"
Fghgttgf'vcz''cuugvu''	"	63.273"
Qyj gt "kpxguvo gpvu"	"	68.38: "
Cmy cpeg'hqt'f qwdvhwrlceeqwpwi"	"	*76+
VQVCN'CUGVU'	"	4.58: .853"

 $\label{eq:prop} $$ P qvg+"Hki wtgu"ctg"kpf kecvgf "d{"f kuectf kpi "htcevkqpu"rguu"vj cp"qpg"o kmkqp"{gp0"} }$

NKCDKNK/KGU' "	"	*o knkqp"{gp+"
Ewttgpv'flcdkkklgu<'	11	3.286.58: "
Ceeqwpu'r c{cdrg."tcf g"	"	563.3: ; "
Uj qt√vgto ''dqttqy kpi u''	"	345.79: "
Eqo o gteken'r er gt"	"	35: .223"
Ewttgpv'r qtvkqp"qh'dqpf u"	"	47.222"
Ceeqwpwl'r c { cdrg. "qyj gt"	"	4; 2.; : 4"
Ceetwgf "gzr gpugu"	"	4.765"
Cf xcpegu't geglxgf "	"	44.644"
F gr quk/t gegkx gf "	"	; 4.38: "
Cmy cpeg'hqt "dqpwigu"	"	8.372"
Qyj gt 'ewtt gpv'rkcdkrkkgu'' ''	"	44.553"
Nqpi/vgto 'ilcdkisigu<'	11	896.579''
Dqpf u"	"	62.222"
Napi /vgto 'f gdv'	"	69; .344"
F ghgttgf 'vez'nkedkrkskgu'vr qp'tgxenweskqp''	"	: 9.; 94"
Tgyktgo gpy'cmy cpegu'hqt"go r m{ggu"	"	34.538"
Tgugtxg'hqt'tgr ckt''y qtmu''	"	47.449"
	"	4; .93; "
Qyj gt"rqpi /vgto "rkcdkrkkgu" "	"	4, .93, 3.95: .948 "
Vqveniiledlalsdgu''	"	3.33: .340
PGV'CUUGVU'	***	**
Uj ctgj qrfgtu)'gs wks{ ''	11	686.; : 2''
Eqo o qp'inqeni'	11	38: .573"
Cf f kkqpcnirckf/kp'ecrkscn'''	11	349.566"
Ecr ken't gugt xg"	"	338.;; 2"
Qyj gt "cf f kkqpcn"r ckf /kp"ecr kxcn"	"	32.576"
Tgw pgf 'gct plpi u''	11	38; .639"
Tgvckpgf "gctpkpi u"tgugtxg"	"	3.2: 3"
Qy gt 'tgvckpgf 'gctpkpi u''	"	38: .558"
Tgugtxg'hqt'ur gekcn'f gr tgekcvkqp''	"	; 63"
Tgugtxg'hqt'hquu'qp'qxgtugcu'kpxguvo gpv.''gve0'	"	958"
Tgugtxg'hqt'f ghgttgf 'kpeqo g'\cz'qp'hkzgf 'cuugvu'	"	54.66: "
Tgwkpgf "gctpkpi u"ecttkgf "hqty ctf" "	"	356.432"
Vt gcuwt { 'inqemi'	11	*355+
Xenweylap'epf 'vt epureylap'ef lwwo gpwi'	11	386.; 46"
Wptgcnk gf 'j qnf kpi 'i ckpu'qp'qvj gt'ugewtkkgu''	"	9.; 23"
Fghgttgf 'i chou's'nquu+"qp "j gf i gu"	"	*3.36: +
Tgxcnwcvqp'fkhgtgpeg'qh'rcpf"	"	37: .393"
Vqv:npgv'cugwi'	"	84;.;26"
VOVCN'NKCDKNKVKGU'CPF'PGV'CUUGVU'	11	4.58: .853"

$\underline{PQP/EQPUQNKFCVGF'UVCVGOGPV'QHKPEQOG''}$

*Cr tkd3."4239"vq'O ctej "53."423: +"

*o kmkgp"{ gp+"

C IKT H		*o kmkqp"{gp+"			
Ceeqwpv'Vkng''	Co qv	Co qwpv'			
11					
Pgvitcrgu''	"	4.968.;:3"			
Equv'qh'tic rgu'	"	4.654.874"			
"Itquu'rtqhky'"	"	536.54; "			
Ugnlpi .'i gpgt cn'cpf 'cf o lpkmt cvlxg'gzr gpugu'	"	432.756''			
Qrgtcvkpi 'kpeqo g''	"	325.9; 6"			
"	"	´ "			
Pqp/qrgtcvlpi 'lpeqo g''	"	"			
Kpvgtguv'kpeqo g"	995"	"			
Fkxkfgpf 'kpeqog''	49.87: "	"			
Uwdukf { 'kpeqo g''	4.986"	"			
Qyj gtu"	94: "	53.; 46"			
"	"	"			
Pqp/qrgtcvlpi 'gzrgpugu''	"	"			
Kpvgtguv'gzr gpugu"	8.268"	"			
Nquu'qp'hqtgki p"gzej cpi g.'pgv'	75"	"			
Qyj gtu"	7.335"	33.435"			
Qtf lpct{'lpeqo g''	"	346.727''			
"	"	"			
Gzvtcqtf lpct { 'lpeqo g''	"	"			
I ckp"qp"ucrgu"qh'hkzgf"cuugvu"	3.8: 5"	"			
I ckp"qp"ucrgu"qh"kpxguvo gpv"ugewtkkkgu"	636"				
I ckp"qp"ucrg"qh"chhkrkcvg"uvqem"	5.5: 7"	7.6: 5"			
"	"	"			
Gzvtcqtf lpct { 'gzrgpugu'	2 025"	"			
Korcktogpv'nquu'qp'hkzgf'cuugvu'	3.935"	"			
Nquu'qp'ucrg'qh'hkz gf ''cuugvu''	48: "	"			
Nquu'qp'f kur qucri'qh'hkz gf ''cuugvu''	5.265"	"			
Nquu''qp''t gxcnvcvkqp''qh''chhkrkcvg''uvqem'	34.5::"				
Nquu'qp''tcpukkqp''vq'f ghkpgf 'eqpvtkdwkqp''r gpukqp'	35.: 32"	"			
r æp" Qyj gtu"	3.377"	54.59; "			
Kpeqo g'dghqtg'kpeqo g'tczgu'	3.377	;9.82: "			
Kpeqo g'\czgu'\'ewttgpv'	3.;;6"	, 7.04.			
Kpeqo g"\czgu"/"f ghgttgf"	6.566"	8.55: "			
Pgv'lpeqo g''	"	:3.492"			

^{*}P qvg+"Hki wtgu'ctg'kpf kecvgf 'd{"f kuectf kpi 'htcevkqpu'nguu'vj cp''qpg''o kmkqp"{gp0'

$\frac{ \text{POP/EQPUQNKFCVGF'UVCVGO GPV'QHEJ CPI GUKP'UJ CTGJ QNFGTU)'GS WKV[.'GVE0' *Cr tkn'3.''4239''vq''O ctej ''53.''423: +'' }$

*o kmkqp"{gp+"

	Uj ctgj qrf gtu)'gs wkv{ "					11 (81				
		Cf f kkqpcn'r ckf /kp''ecr kxcn'			Tgwkpgf "gctpkpi u"					
				3 .7 !!				gf "gctpkpi u"		
n .	Eqo o qp" uvqem'	Eer ken' tgugtxg"	Qyj gt" cf f kwlqpcn' r ckf /kp" ecr kvcn'	Vqvcn' cf f kskqpcn' r ckf /kp'' ecr kscn'	Tgvckpgf" gctpkpi u" tgugtxg"	Tgugtxg'hqt" urgekch' fgrtgekckkqp"	Tgugtxg'hqt" nquu'qp" qxgtugcu" kpxguvo gpv." gve0"	Tgugtxg"hqt" f ghgttgf" kpeqo g"kcz" qp"hkzgf" cuugvu"	Tgwkpgf" gctpkpi u" ecttkgf" hqty ctf"	Vqv:n' tgv:lpgf " gctplpi u"
Derepeg'cv'Cr tkrl'3.'4239"	32: .828"	79.467"	32.576"	89.7;;"	3.2: 3"	3.476"	646"	55.66; "	73.; 54"	::.362"
Ej cpi gu'f wtkpi ''y g''{ gct ''	"	"	"	"	ıı	"	"	"	"	"
Kuwcpeg'qh'pgy 'trqem'	7; .966"	7; .966"	"	7; .966"	"	"	"	"	•	,
Fkutkdwkqp"qh"tgvckpgf "gctpkpi u" "	"	=	"	=	"	"	=	"	*34.538+	*34.538+
P gv'kpeqo g"	"	"	"	=	"	"	"	"	; 3.492"	; 3.492"
Ces wkukskqp"qh"vtgcuwt { "uvqem"	"	"	"	=	"	"	"	"	"	,,
Cffkkqpu'\q'qyjgt'tgvckpgf 'gctpkpi u''	"	"	"	=	"	"	56; "	3.348"	*3.698+	/"
Tgxgtucn'qh'qvj gt'tgvckpgf "gctpkpi u"	"	=	=	=	"	*534+	*58+	*4.349+	4.698"	/"
Tgxgtucn'qh'tgxcnwcvkqp"f khhgtgpeg"qh" rcpf "	"	"	"	"	"	"		"	4.546"	4.546"
Ej cpi gu'l\p'l\sgo u'q\yj gt'\yj cp" uj ctgj qnf gtu)'gs wkx{ 'f wtl\pi '\yj g''{ gct" *pgv+"	"	"	"	"	"	"	"	"	"	"
Vqvcn'ej cpi gu'f wtkpi 'vj g''{ gct ''	7; .966"	7; .966"	/"	7; .966"	/"	*534+	534"	*3.222+	: 4.499"	: 3.499"
Dcmpeg'cv'O ctej '53.'423: "	38: .573"	338.; ; 2"	32.576"	349.566"	3.2: 3"	; 63"	958"	54.66: "	356.432"	38; .639"

*o kmkqp"{gp+"

"	Uj ctgj qnf	gtu)'gs wkv{ "		n (S)			
	Vtgcuwt{"uvqemu"	Vqvcn' uj ctgj qrf gtu)'' gs vkv{ ''	Wptgcrk gf " j qrf kpi "i ckpu"qp" qyj gt"ugewtkkgu"	F ghgttgf 'i ckpu'' *nquu+"qp'j gf i gu''	Tgxcnwcvkqp" f khhgtgpeg"qh" ncpf"	Vqvcn'xcnwcvkqp" cpf "vtcpurcvkqp" cf lwwo gpvu"	Vqvcn'pgv'cuugvu"
Dempeg"ev"Crtkij3."4239"	*353+	486.437"	8.667"	*4.: 46+	377.763"	37; .384"	645.599"
Ej cpi gu'f wtkpi '\j g''{ gct''	"	=	"	,	,	=	"
Kuwcpeg'qh'pgy 'twqem'	"	33; .6: ; "	"	,	,	=	33; .6: ; "
Fkwkdwkqp"qh'tgvckpgf "gctpkpi u" "	"	*34.538+	"	"	"	п	*34.538+
P gv'kpeqo g"	"	; 3.492"	"	"	"	п	; 3.492"
Ces wkukkqp"qh"vtgcuwt { "uvqem"	*3+	*3+	"	"	"	п	*3+
Cf f kkqpu"vq"qyj gt"tgvckpgf "gctpkpi u"	"	/"	"	"	"	=	/"
Tgxgtucn'qh'qyj gt'tgvckpgf "gctpkpi u"	"	/"	"	"	"	"	/"
Tgxgtucn'qh'tgxcnwcwlqp"f khhgtgpeg"qh' rcpf"	"	4.546"	"	11	*4.546+	*4.546+	/"
Ej cpi gu'kp'kgo u'qyj gt''yj cp'' uj ctgj qrf gtu)'gs wkx{ "f wtkpi "'yj g''{gct'' *pgv+"	п	11	3.677"	3.898"	6.; 75"	: .2: 8"	: .2: 8"
Vqvcn'ej cpi gu'f wtkpi ''y g''{ gct ''	*3+	422.986"	3.677"	3.898"	4.84; "	7.984"	428.749"
Dcmpeg'cv'O ctej '53.'423: "	*355+	686.; : 2"	9.; 23"	*3.36: +	37: .393"	386.; 46"	84; .; 26"

^{*}Pqvg+" Hki wtgu'ctg'kpf kecvgf 'd{ ''f knectf kpi 'htcevkqpu'nguu'vj cp'qpg''o knkqp''{gp0'}

POVGUVO'P OP/EQPUQNKF CVGF 'HKP CPEKCN'UVCVGO GPVU'

30' O cwgtu'eqpegtpkpi 'uki pkhecpv'ceeqwpwkpi 'r qnkekgu'' *3+" Dcuku'cpf 'o gyj qf 'qh'xcnxcvkqp'qh'cuugvu'' Dcuku'cpf 'o gyj qf 'qh'xcnwcvkqp'qh'ugewtkxkgu<" Cv'co qtvk gf 'equv'*uvtcki j v rkog'o gvj qf +" c0' Dapf u'va'dg'i grf 'va'o cwtkv{< d0' Cv'equv''f gvgto kpgf "d{"vj g"o qxkpi "cxgtci g" Ecr kvcn'uvqemu'qh'chhkrkcvgu<" o gyj qf" e0' Qyj gt 'ugewtkkgu<' " "Vj qug"y kij "o ctmgv"xcnwg<" Cv'o ctngv'xcnvg."y j kej "ku"f gvgto kpgf "d{ "vj g" cxgtci g"qh"yj g"emukpi "o ctngv"r tkegu"hqt"qpg" o qpyj "rtkqt"vq"yj g"enqug"qh"yj g"hkuecn' {gct0'" Tgxcnvcvkqp" f khhgtgpegu" ctg" cml' vtcpuhgttgf " fktgevn{'vq'pgv'cuugvu0' Ces wkukkqp"equvu."y j kej "uj cm'dg"eqo r ctgf " y kj "o ctngv" xcnvg." ctg" f gvgto kpgf "d{" vj g" o qxkpi "cxgtci g"o gyj qf 0" " • "Vj qug'y kyj qw'o ctngv'xcnwg<' Cv'equv."f gvgto kpgf "d{"vj g"o qxkpi "cxgtci g" o gyj qf" *kk+" Dcuku'cpf 'o gyj qf ''qh''gxcnvcvkqp''qh''kpxgpvqtkgu<'' O gtej cpf kug"cpf 'hkpkuj gf 'i qqf u."cpf " " " Tcy 'o cygtken'epf 'uwr r nkgu<' Cv' equv." f gvgto kpgf "d{" yj g" i tquu" cxgtci g" o gyi qf. 'kp'r tkpekr rg'*yj g'dcrcpeg''uj ggv'xcnwgu'' ctg" ecrewrcygf " d{" yj g" y tkyg/f qy p" o gyj qf " dcugf 'qp'f gerkpgf 'o cti kpu+0' *kkk+" Dcuku"cpf "o gyj qf "qh"gxcnwcvkqp"qh"f gt kxcvkxgu<" " Cv'o ctngv'xcnwg" *4+" Ogyj qf "qh"f gr tgekcvkqp"qh"hkzgf "cuugvu" Vcpi kdrg'hkz gf "cuugwu" *k;" *gzenwf kpi 'ngcug'cuugvu+<' D{"yj g"uvtcki j √nkpg"o gyj qf " *k+" Kovepi kdrg'hkzgf "cuugwu" *gzenwfkpi 'ngcug'cuugvu+<'' j qy gxgt." yj cv" uqhvy ctg" hqt" kpvgtpcn" wug" ku" co qt vk gf "d{"yi g"uvtcki j √nkpg"o gyi qf "qp"yi g" guvko cvgf "wughwn' nkhg" qh" kpvgt pcn' wug" *hkxg" {gctu+0'

*kkk+" Ngcug"cuugvu<"

D{"y g"untcki j vnkpg"o gyi qf "qp"y g"cuuwo r vkqp" yj cv'yj g''rgcug''r gtkqf "ku''yj g''wughwn'rkhg''qh''yj g'' rtqrgtv{"cpf"'yjg"tgukfwcn'xcnwg'ku"|gtq0"

Kp"cffkkqp."hkpcpeg"rgcug"vtcpucevkqpu"y j kej " f q" pqv" vtcpuhgt" qy pgtuj kr ." hqt" y j kej " vj g" eqo o gpego gpv'f cvg"qh'y g"vtcpucevkqpu"y cu" O ctej '53.'422: 'qt'\j gtg\qhqtg.'cp'ceeq\p\kpi " o gyj qf "uko krct" vq" yj g" o gyj qf "hqt" qtf kpct {" ngcug'tcpucetkqpu'ku'cr r nkgf 0'

*5+" Dcuku'hqt''ceeqwpvkpi 'hqt''cmqy cpegu''cpf 'tgugtxgu''

Cmy cpeg'hqt'f qwdvhwiceeqwpuk'

Vq" o ggv" muugu" htqo " mqcp" f ghcwn." yj g" Eqorcp{" ugvu" cukfg" cp" guvko cvgf" wpeqmgevkdng" co qwpv." d{" vcnkpi " kpvq" eqpulf gtclqp"yj g"cewcn'hquu'tcvg'lp"tgur gev'qh" i gpgtcn'etgf ku'cpf 'y g'kpf kxkf won'r quukdkrkkgu'' qh" eqmgevkqp" kp" tgur gev' qh" ur gekhke" encko u." uwej "cu'r tqdcdrg"pqp/r gthqto kpi "etgf ku0"

*kt:" Cmy cpeg'hqt'dqpwugu<"

Vq'o ggv'ij g'r c{o gpv'qh'dqpwugu'\q'go r mq{ggu." yj g"Eqo r cp{"ugvu"cukf g"yj g"r qt vkqp"hqt"yj g" hkuecn' {gct" wpf gt" tgxkgy " qh" cp" gurko cvgf " co qwpv'qh'dqpwugu'\q'dg'r ckf 'kp'\j g'hwwtg0'

*kkk+" Tgvktgo gpv'cmqy cpegu'hqt"go rm{ggu<"Vq"o ggv'yj g'rc{o gpv'qh'tgvktgo gpv'dgpghku'\q" go rm{ggu.'yj g'Eqo rcp{'rtqxkf gu'cp'co qwpv' gusko cvgf "vq"ceet wg"cv" y g"enqug"qh" y g"hkuecn" {gct"wpf gt"tgxkgy ."dcugf "qp" yj g"guvko cvgf " tgyktgo gpv" dgpghky" qdrki cykqpu" cpf "r gpukqp" r ncp"cuugvu'cu'qh'vj g"enqug"qh'gcej 'uwej 'hkuecn' {gct0'

Cewctlen'f khgtgpegu''ctg''ttgcvgf "cu''gzr gpugu." dcugf " qp" yj g" uvtcki j v" rkpg" o gyj qf " hqt" c" ur gekhke" r gtkqf " qh" {gctu" *vgp" {gctu+" pqv" gzeggf kpi " yj g" cxgtci g" tgo ckpkpi " {gctu" qh" ugtxkeg"qh"gornq{ggu."htqo "yjg"hkuecn"{gct" pgz v" hqmqy kpi " vj g" hkuecn" {gct " y j gp" uwej " fkhlgtgpegu" qeewt0' " Rtkqt" {gct" ugtxkeg" nkcdkrkskgu"ctg"vtgcvgf "cu"gzr gpugu"kp"c"nwo r " uwo "f wtkpi " yj g" hkuecn' {gct "yj gp" uwej " nkcdkrkkkgu'qeewt0'

*kx+" Tgugtxg'hqt'tgrckt'y qtmı<"

Vq"o ggv"yj g"rc{o gpv"hqt"tgrckt"gzrgpugu"kp" yj g'hwwtg."yj g'Eqo r cp{ 'ugwl'cukf g'\j g'r qt\kqp" hqt'vj g'hkuecn'{gct'wpf gt'tgxkgy ''qh'cp''co qwpv'' qh"gzr gpugu"qh"kpur gevkqp"cpf "tgr ckt"vq"dg" f ghtc { gf " kp" tgur gev" qh" yj g" qkn" vcpmu" cpf "

o cej kpgt{" cpf " gs wkr o gpv' vj cv' tgs wktg" r gtkqf ke'tgr cktu'kp''yj g'hwwxtg0'

*6+" O gyj qf "qh"j gf i g"ceeqwpvkpi "

*k+" O gyj qf "qh"j gf i g"ceeqwpvkpi <"

F ghgttch'j gf i g'ceeqwpwlpi 'ku'cr r nlecdng0'

*kk+" J gf i g'kpuvtwo gpvu'cpf 'j gf i gf 'kvgo u<"

J gf i g'kpuvtwo gpvu<"

Hqty ctf "gzej cpi g"eqpvtcevu."ewttgpe{"qr vkqp" vtcpucevkqpu."hqtgki p"ewttgpe{"f gdvu"r c{cdrg." hwwtgu"vtcpucevkqpu."etwf g"qkri'cpf "r gvtqrgwo" r tqf wevu" uy cr " vtcpucevkqpu." kpvgtguv" tcvg" uy cr u. "kpvgtguv'tcvg"cpf "ewttgpe{"uy cr u."cpf " qr vkqp"vtcpucevkqpu0'

J gfigf'kygo u≺'

Hqtgki p"ewttgpe{"tgegkxcdrgu"cpf"rc{cdrgu." hqtgki p"ewttgpe{"kpxguvo gpv!ugewtkkgu."gs wkx{" kpvgtguvu"kp"qxgtugcu"uwdukf kctkgu."etwf g"qkrl"cpf"r gvtqrgwo "rtqf wewl"cpf "f gdvu"rc{cdrg0'

*kkk+" J gf i kpi 'r qnke{<"

"

Vj g"Eqo r cp{."kp"ceeqtf cpeg"y kj "ku"twrgu." ecttkgu" qw" j gf i g" vtcpucevkqpu" y kj kp" y g" ueqr g"qh"cewcn'tgs wktgo gpvu"q"j gf i g"tkum'qh" r tkeg" ej cpi gu." kpvgtguv" tcvg" cpf " ewttgpe{" hnwewcvkqpu"y kj "tgi ctf "vq"j g"j gf i gf "ksgo u0' Vtcf kpi "xqnwo gu"kp"kpvgtguv"tcvg"uy cr u"cpf " hqty ctf " gzej cpi g" eqpvtcevu" ctg" nko ksgf " y kj kp"cewcn'tgs wktgo gpvu0'

*kx+" O gyj qf "qh"gxcnwcvkpi 'vj g"ghhgevkxgpguu'qh"c"j gf i g<"

Vj g'o gyi qf 'qh'gxcnwcvkpi ''y g'ghhgevkxgpguu'qh' c''j gf i g''ku''vq''eqphkto ''yi g''eqo r nkcpeg''qh''yi g'' j gf i kpi ''kpuntwo gpwu''y kyj ''yi g''j gf i gf ''kwgo u0' '' P q''gxcnwcvkqp''ku''o cf g''cu''vq''yi g''ghhgevkxgpguu'' qh'' cp{" vtcpucevkqp" kp" y j kej " ko r qtvcpv' eqpf kklqpu''ctg''eqo o qp''hqt''yi g''j gf i gf ''cuugwu'' cpf ''nkcdkrkkgu''qt''uej gf wrgf ''vtcpucevkqpu''cpf '' r tkeg" ej cpi gu'' qt" ecuj " hrqy " ej cpi gu'' ctg'' cuuwo gf "kp''cf xcpeg" vq''dg''qhhugv''wr qp'' yi g'' eqo o gpego gpv'qh''yi g''j gf i kpi ''cpf ''eqpvkpwg'' vq''dg''qhhugv'yi gtgchwgt0'

*7+" Qyi gt'ko r qtvcpv'o cvvgtu'hqto kpi 'yi g''dcuku''qh'r tgr ctcvkqp''qh'hkpcpekcn'uvcvgo gpvu''

*k+" Ceeqwpvkpi "tgcvo gpv'qh'f ghgttgf "cuugvu<"

Dqpf "kunwcpeg" gzr gpugu" cpf "uvqem' kunwcpeg" gzr gpugu" ctg" cm' vtgcvgf "cu" gzr gpugu" wr qp" rc{o gpv'yj gtgqh0'

*kk+" Ceeqwpvkpi '\tgcvo gpv'qh'eqpuwo r vkqp'\czgu.''gve0\'

/'7; "/"

Eqpuwo r klqp" vczgu" cpf " rqecn' eqpuwo r klqp" wzgu'ctg'gzenwf gf 'htqo 'gcej 'ceeqwpv'uwdlgev' vq'uwej '\czgu0'

*8+" Ej cpi g'kp'ceeqwp\kpi 'r qrkekgu"

P qv'cr r nlecdng"

*9+" Ej cpi gu'kp'r tgugpvcvkqp'o gyj qf u''

P qv'cr r nlecdrg"

40' P qvgu''vq''vj g''pqp/eqpuqnkf cvgf ''dcrcpeg''uj ggv''

*3+" Cuuguu'r ngf i gf "cpf "eqtt gur qpf kpi "rkcdkrkskgu"

Cuugwi'r ngf i gf "

*k+"	Hoevqt { 'hqwpf cvkqp'o qtvi ci g<'	"
"	Nepf "	Ø559.; 85"o kmkqp"
*kk+"	Qý gt"r mgf i gu<"	"
"	Kpxguvo gpv'ugewtkukgu"	Ø7.2:: "o kmkqp"
"	Kpxguvo gpvu'kp''uj ctgu''qh''chhkrlcvgu''	Ø5.222" o kmkqp"
"	Vqvcn'	Ø568.273"o knkqp"

Kp"cffkkqp"\q"\j g"cdqxg."\j g"Eqorcp{"rngfigf"kpxguvo gpv"ugewtkkgu"*kpxguvo gpvu"kp" uj ctgu" qh" chhkrkcvgu+" kp" P i j k" Uqp" Tghkpgt {" cpf " Rgvtqej go kecn' NNE" *\$P UTR\$+." co qwpvkpi "vq"Ø, 2.867"o kmkqp."cu"eqmcvgtcn"hqt"P UTR)u"dqttqy kpi u"htqo "hkpcpekcn" kpurkwwkqpu0'

Nkcdkrkkgu'y ky "cuuguu'r ngf i gf "

Heevat { 'havpf evkap'o atvi ei g<'

	Ceeqwpw'r c {cdrg/qyj gt"	Ø86.796"o kmkqp"
"	Vqvcn'	Ø86.796"o kmkqp"

Vj g"ceeqwpuu'r c{cdrg/qyj gt"y gtg"tgrcvgf "\q"r c{o gpv'qhl'i cuqrl\pg"\cz0"

Kp"cffkkkqp"\q"vjg"cdqxg."cnjqwij"yjg"hcevqt{"hqwpfckkqp"ycu'uwdlgevgf"\q"c" tgxqrxkpi "o qtvi ci g'tgrcvgf 'vq''dcpm'vtcpucevkqpu. "vj gtg"y gtg"pq'uwduvcpvkcn'rkcdkrkkgu" y ky 'cuuguu'r ngf i gf 0'

 $\varnothing 8.925.32$; "o kmkqp" *4+" Ceewo wrcvgf "f gr tgekcvkqp"qh"vcpi kdrg"hkz gf "cuugvu"

*5+"	Eanskoi	gpv'rkcdkrkkgu<"
<i>J</i> 1		Sp / II Calling a \

I wctcpvgg"qh"qdrki cvkqpu"	Ø34; .3; ; "o kmkqp"
O cpci go gpv'f ktgevkxg"o go qtcpf wo u"	Ø75"o kmkqp"
Eqpuvtwevkqp"eqo r ngvkqp"i wctcpvgg"	Ø886.798" o kmkqp"
Vqvcn'	Ø4; 5.: 4; "o kmkqp"

*6+" Tgegkxcdrgu"htqo "chhkrlevgu"cpf "r c { cdrgu"vq"chhkrlevgu<"

* k +"	Uj qt√vgto 'tgegkxcdrgu'htqo ''chhkrkcvgu<''	Ø88; .687"o knkqp"
*kk+"	Nqpi/vgto 'tgegkxcdrgu'htqo 'chhkrkcvgu<'	Ø86.3; 8"o kmkqp"
*kk+"	Ujqt√vgto 'rc{cdngu'vq'chhknkcvgu<'	Ø866.527"o kmkqp"
*kx+"	Nqpi/vgto "rc{cdrgu'\q"chhkrlcvgu<"	Ø 46"o knkqp"

*7+" Nepf "tgxcnwedqp"

Kp"ceeqtf cpeg"y ky "vj g"Ncpf "Tgxcnxcvlqp"Cev*CevPq056."r tqo wri cvgf "qp"O ctej "53." 3; ; : +"qh"Icr cp"cpf "vj g"Cev'vq"Co gpf "Rctv'qh"vj g"Ncpf "Tgxcnxcvlqp"Cev*Cev'Pq03; ." r tqo wri cvgf "qp"O ctej "53."4223+"qh"Icr cp."vj g"Eqo r cp{)u"rcpf "wugf "hqt"dwukpguu"ku" tgxcnxcvgf "cpf "cp"co qwpv"gs wkxcrgpv"vq"vczgu"qp"vj g"f khtgtgpeg"qp"tgxcnxcvlqp"ku" kpenxf gf "kp"nkcdkkkgu"cu"\$f ghgttgf "vcz"nkcdkkklgu"wr qp"tgxcnxcvlqp\$"cpf "vj g"f khtgtgpeg" qp"tgxcnxcvlqp"b gy g"f khtgtgpeg"qp"tgxcnxcvlqp"b fktgtgpeg"ktgxcnxcvlqp"b gy g"co qwpv'qh'uwej "czgu'ku'kpenxf gf 'kp'pgv'cuugw'cu'\$tgxcnxcvlqp" fkthgtgpeg"qh'rcpf \$0'

*k+" Ogyj qf "qh"tgxcnvcvkqp<"

Ncpf "tgxcnwc\qp"ku"o cf g"kp"ceeqtf cpeg"y kj "y g"o gyj qf qh"ecrewrc\qp"d{"o cnkpi "tgcuqpcdrg"cf lwuvo gpwu"q"y g"cuuguugf "xcnwg"qh"hkz gf "cuugwu"cu"ugv"hqty "kp"Ct\kerg"4." kgo "5"qh"y g"Qtf kpcpeg"vq"Korngo gpv"y g"Ncpf "Tgxcnwc\qp"Cev"*Ecdkpgv"Qtf gt"Pq0'33; ."rtqo wri cvgf "qp"O ctej "53."3; ; : ="y g"\$Qtf kpcpeg\$+:"y g"o gyj qf qh"ecrewrc\qp"d{"o cnkpi "tgcuqpcdrg"cf lwuvo gpvu"vq"y g"rcpf "xcnwgu"y cv"hqto "y g"dcuku"qh"rcpf "vcz" ecrewrc\qpu"cu"ugv"hqty "kp"Ct\kerg"4."kgo "6"qh"y g"Qtf kpcpeg."cpf "crrtckucnu"d{"tgcn' guvcy"crrtckugtu"cu"ugv"hqty "kp"Ct\kerg"4."kgo "7"qh"y g"Qtf kpcpeg0'

*kk+" Tgxcnwcvkqp"fcvg<"

Octej '53.'4224"

*Net" F khogt gpeg "qh" yi g"o ctnogv"xcnwg "cv" yi g"gpf "qh" yi g"hkuecn" { gct "wpf gt "tgxkgy "qh" yi g"ncpf "tgxcnwc vkqp<" yi g"dqqm"xcnwg "yi gtgqh"chogt "uwej "tgxcnwc vkqp<"

*10866.497"o kmkqp+"

50' P qvgu''vq''vj g'pqp/eqpuqnkf cvgf 'uvcvgo gpv'qh'kpeqo g''

*3+" Vtcpucevkqpu'y kyj "chhkrkcvgu<"

* k ⊹"	Ucrgu√"	Ø948.372"o kmkqp"
*kk+"	Rwtej cugu<"	Ø5: 7.529"o kmkqp"
*kk+"	Vtcpucevkqpu"qyj gt"yj cp"qtfkpct{"dwukpguuk"	Ø46.46; "o knkqp"

*4+" Nquu'qp'\tcpukkqp'\q'f ghkpgf 'eqp\tkd\wkqp'r gpukqp'r rcp"

 $\label{thm:continuous} Vj\ g"Eqo\ r\ cp \{ "vtcpuhgttgf\ "cmqy\ cpegu"r\ tgxkqwun \{ "r\ tqxkf\ gf\ "cu"c"r\ ctv"qh"go\ r\ m \{ ggøu"eqo\ r\ gpukqp"r\ cenci\ gu"vq"c"f\ ghkpgf\ "dgpghku"r\ gpukqp"u \{ uvgo\ "kp"vj\ g"hkucn" \{ gct"wpf\ gt"tgxkgy\ "cpf\ "vtcpukkqpgf\ "vq"c"f\ ghkpgf\ "eqpvtkdwkqp"r\ gpukqp"u \{ uvgo\ "ghhgevkxg"Cr\ tkrl'3."423:0"Vj\ g"hquugu"f\ wg"vq"vj\ ku"vtcpukkqp"ctg"tgeqtf\ gf\ "cu"gzvtcqtf\ kpct { "gzr\ gpugu0"}$

$60^{\prime}_{\rm ''}$ P qvgu''vq''vj g''pqp/eqpuqrkf cvgf ''uvcvgo gpv''qh''uj ctgj qrf gtu)''gs wkv{ .''gve0'

O cwgtu'eqpegtpkpi ''y g''pwo dgt''qh''uj ctgu''qh''tgcuwt { ''uvqemc''

Encuu''qh''uj ctgu''	P wo dgt "qh"uj ctgu" cu"qh"Cr tki'3."4239'	Kpetgcug'kp'yi g" pwo dgt'qh'uj ctgu" f wtkpi 'yi g"{gct"	F get gcug'kp''y g" pwo dgt''qh''uj ct gu'' f wtkpi ''y g''{ gct''	P wo dgt "qh"uj ctgu" cu"qh"O ctej "53." 423: "
Uj ctgu''qh'' eqo o qp''uvqem'	69''y qwucpf'' uj ctgu''	2''y qwucpf ''uj ctgu''	/"	69"yj qwucpf" uj ctgu"

*Pqvg+" Vj g'pwo dgt ''qh''uj ctgu''qh''utgcuwt { ''uvqem'kpetgcugf ''d { ''2" y qwucpf ''uj ctgu''cu''c'tguwn''qh''y g'' uj ctgj qnf gtu)'tgs wguvu'hqt'r wtej cugu''d { ''y g'Eqo r cp { ''qh''nguu' y cp/qpg/wpk'uj ctgu0'

70' P qvgu''qp''vcz ''ghhgev''ceeqwpvkpi ''

"

"

Rt kpekr cn'eqo r qpgpvu'qh'f ghgttgf 'vcz 'cuugvu'cpf 'f ghgttgf 'vcz 'nkcdkrkkgu<'

"	*F	ghgttgf "vcz"cuugvu+"	"	"	*o kmkqp"{gp+"
"		Vcz "muu"ectt { 'mty ctf u"	"		5; .839"
"		Tgugtxg'hqt'tgrckt'y qtmi"	"		9.946"
"		Vcz "głłgev"qp" lpxguvo gpvu"	"		9.8: 8"
"		Korcktogpv'hquu'qp'hkzgf'cuugvu''	"		8.8; 3"
"		Tgltgo gpv'cmy cpegu'hqt 'go r nq { ggu''	"		7.; 87"
"		Ceeqwpwl'rc{cdrg'wrqp'\tcpukkqp'\q'fghkpgf" eqpvtkdwkqp'rgpukqp'rrcp"	"		6.38: "
"		Uqhy ctg"	"		5.: 59"
"		Gurko cvgf "ucrgu"r tlegu"	"		4.983"
"		Cmpy cpeg'hqt'dqpwigu" "	"		3.::5"
"		Fghgttgf 'nquu'qp'j gfi gu''	"		3.668"
"		Dwukpguu'untwewstg'kortqxgogpv'gzrgpugu"	"		626"
"		Wptgcrk gf 'j qrf kpi 'i ckpu''qp''qyj gt''ugewtkkgu''	"		46"
"		Qý gtu"	"		5.626"
"	"	Uwdvqvcn'qh'f ghgttgf 'vcz "cuugvu"	"		: 7.838"
"	"	Xcnvcvlqp"tgugtxg"	"		*34.72: +"
"	"	Vqvcn'f ghgttgf 'vcz''cuugvu''	"	"	95.329"
"	*F	ghgttgf "\cz"n\cdkn\kgu+"	"		"
"		Tgugtxg'hqt'f ghgttgf 'kpeqo g'\cz'qp'hkzgf 'cuugwi'	"		*36.542+"
"		Wptgcrkł gf "j qrf kpi "i ckpu"*rquu+"qp "qyj gt "ugewtkkgu"	"		*5.675 + "
"		Fghgttgf 'i ckpu'*nquu+"qp'j gfi gu"	"		*, 5; +"
"		Tgugtxg'hqt'ur gekcn'f grtgekcvkqp"	"		*637+"
"		Tgugtxg'hqt'nquu'qp''qxgtugcu'kpxguvo gpv'	"		*547+"
"		Vqvcn'f ghgttgf "\cz"n\cdkrkkgu"	"		*3; .676+"
"		Pgv'fghgttgf'vcz''cuugwi''	"		75.875"

80' $P q vgu''qp''vj g''hkz gf ''cuugwu''wugf ''d { ''ngcug''} ''$

"

' Vj g'pqvgu''ctg''qo kwgf ''dgecwug''y g{ ''ctg'kpuki pkhecpv0'

90' P qvgu'qp''tcpucevkqpu''y kyj 'tgrcvgf 'r ctvkgu''

Cwtkdwg"	Vtcf g'pco g"	Ecr kcn'uvqem' *o knkqp"{gp+"	Rt kpekr cn'd wukpguu"	Tcwq"qh'xqwpi " tki j w"qy pgf "d{"y g" Eqo r cp{ "qy pgf " kp"y g" Eqo r cp{+" +"	Tgrcvkqpuj kr'	Vtcpucevkqp"	Vtcpucevkqp" co qwpv" *o knkqp"{gp+"	Ceeqwpv" ksgo "	Gpf/qh/{gct" dcrcpeg" *o knkqp"{gp+"
Uwdukf ket { "	K go kuw' Cwintcikc" Tguqwtegu'Rv{" Nvf 0'	C&328.8; : " yj qw.cpf "	Koxguvki cvkqp." gzr nqtcvkqp." f gxgnqr o gpv'cpf " ucng"qh"eqcnı"	322Œ"	P qpg"	Ceeqo o qf cvlqp"qh" uwtr nwu'hwpf u" " *P qvg"3+"	49.5; ; "	F gr qukv''	49.578"
						I wetepygg"qh" qdrki cykqpu'*P qyg"4+"	78.692"	/"	/"
Uwdukf ket { "	K go kuw'' Kpygtpcylqpen'' *Culc+'Ryg0' Nvf 0'	WU&467.378" yj qw.cpf "	Ko r qtv."gzr qtv'cpf " vtcf kpi "qh'etwf g"qkn" r gvtqrgwo " r tqf wevu."gve0'	322Œ"	P qpg"	Rwtej cug"qh" r gwtqrgwo "r tqf wew." gwe0*P qwg"5+"	424.986"	Ceeqwpwi" rc{cdrg/" vtcf g"	53.587"
						I wctcpvgg"qh" qdrki cvkqpu"*P qvg"6+"	56.8; 6"	/"	/"
Chholeog"	Kigo kuw! Etgf k!Eq0" Nvf 0'	3.; 72"	Etgf k/ectf "cpf " etgf k/i wctcpwgg" dwukpguu"	72 œ "	P qpg"	Eqngevkqp"qh'vtcf g" tgegkxcdngu" *P qvg"7+"	3.237.25: " *P qvg'8+"	Ceeqwpw" tgegkxcdrg/" qyjgt"	67.97: "
Chhklevg"	Rtko g" Rqn{ o gt"Eq0" Nvf 0'	42.222"	Rtqf wevkqp"cpf 'ucrg" qh"ej go kecri' rtqf wevu."gve0'	57 © "	P qpg"	Ucrg''qh' r gwtqej go kecri' r tqf wew. "gwe0' *P qvg9+"	;:.484"	Ceeqwpw" tgegkxcdrg/" vtcf g"	49.374"
Chholeog"	Pijk"Uqp" Tghkpgt {"cpf" Rgvtqej go kecn" NNE"	WW4.584.945" yj qw.cpf ""	Qkiltghkpgt { "cpf " rtqf wevkqp"cpf "ucrg" qh'r gytqej go kecri" rtqf wevu"	5708"	P qpg"	Eqpust weslqp" eqor gylqp" i wetepygg"*P qyg": +"	386.798" "*P qvg"; +"	/"	/"

^{*}Pqvg"3+"Vjg"Eqorcp{"fgvgto kpgu"yjgvjgt"vq"ceeqooqfcvg"kuu'uwtrnwu'hwpfu'ykj"eqpukfgtcvkqp"hqt"octngv'kpvgtguv'tcvgu0'
*Pqvg"4+"Vjg"Eqorcp{"iwctcpvggu"qdrkicvkqpu"rtkpekrcm("hqt"dcpmhqcpu0'
*Pqvg"5+"Vjg"Eqorcp{"fgvgto kpgu"yjgvjgt"vq"rwtejcug"rtqfwevu."gve0ykj"eqpukfgtcvkqp"hqt"octngv'rtkegu."gve0'
*Pqvg"6+"Vjg"Eqorcp{"iwctcpvggu"qdrkicvkqpu"rtkpekrcm("hqt"rwtejcukpi"iqqfu0'

*P qvg'7+"Vj g'Eqo r cp{"tgegkxgu"htqo "K go kuw'Etgf k/'Eq0'Nvf 0'r ctv'qh'vj g''tcf g''tgegkxcdrgu'qh''r gvtqrgwo "r tqf we'u. "gve0'hqt "gzenwikxg"f kuvkdwqtu''*chwgt "qhhugwi'd{" uwej "gzenwikxg"f kuvkdwqtu''ci ckpuv'etgf k/'tgegkxcdrgu'htqo "K go kuw'Etgf k/'Eq0'Nvf 0#0'
*P qvg''8+"Vj g''tcpucevkqp''co qwpv'tgr tgugppw''vj g''qvcn'cppwcn'eqnrgevkqp''co qwpv0'
*P qvg''9+"Vj g'Eqo r cp{"f gygto kpgu'y j gvj gt''q'ugm'kwi'r tqf we'u. "gve0'y kyj "eqpulf gtcvkqp'hqt'o ctngv'r tkegu. "gve0'
*P qvg'': +"Vj g'Eqo r cp{"j cu'r tqxkf gf "c''eqpuvtwevkqp''eqo r rgykqp''i wctcpvgg'hqt''y g''r tqlgev'hpcpeg'kp'eqppgevkqp'y kyj "vj g''r tqlgev'qh'eqpuvtwevkpi "vj g'P i j k'Uqp''T ghkpgt{"

cpf "Rgvtqej go kecn'Eqo r ngz0' "Kp"cff kkqp. "vj g"Eqo r cp{ "r ngf i gf "kpxguvo gpvl'ugewtkkgu" kpxguvo gpvu"kp"uj ct gu "qh"chhkrkcvgu+"kp"P i j k"Uqp"Tghkpgt { "cpf" Rgvtqej go kecn'NNE "%P UTR\$+. "co qwpvkpi "vq"Q, 2.867"o knkqp. "cu "eqnrcvgtcn'hqt "P UTR). "dqttqy kpi u'htqo "hkpcpekcn'kpvkwwkqpu0'

*P qvg"; +"Vj g"tcpucevkqp"co qwpv'tgrtgugpvu"y g"r qtvkqp"qh"y g"i wctcpvgg"co qwpv'r tqxkf gf "d{"vj g"Eqo r cp{0"

"
: 0' P qvgu"qp"vj g"lphqto cvlqp"r gt"vj ctg"

3+" P gv'cuugwi'r gt"vj ctg"{gp+<'' 5.24; 02: "

4+" P gv'kpeqo g"r gt"vj ctg"{gp+<'' 697048"

"

/''88''/''

CWF KVQTU)'TGRQTV'QP'VJ G'EQPUQNKF CVGF'HKPCPEKCN'UVCVGO GPVU'

IPFGRGPFGPV'CWFKVQTU)TGRQTV"

Oc{"33."423: "

Vq<' Vj g'Dqctf 'qh'Fktgevqtu'' Kfgo kuw'Mqucp'Eq0''Nvf0'	
" " "	F grqkwg"Vqwej g"Vqj o cww'NNE"
"	Mcrrgk'Kuqo cvc" *ugcnt" F guki pcvgf "Wprko kvgf "Nkcdkrkv{ 'Rctvpgt." Gpi ci go gpv'Rctvpgt." Egtvkhkyf 'Rwdrke'Ceeqwpvcpv'
"	Fck' co co qvq" *ugcn+" F guki pcvgf "Wprko kvgf "Nkcdkrkv{ "Rctvpgt." Gpi ci go gpv'Rctvpgt." E gt vkhkgf "Rwdrke "Ceeqwpvcpv"
"	Oqvq{wnk'Uw wnk' *ugcn+" Fguki pcvgf "Wpnko kvgf "Nkcdkrkv{ "Rctvpgt." Gpi ci go gpv'Rctvpgt." Egtvkhkyf "Rwdrke"Ceeqwpvcpv'
"	P cqcml/Kpci cml/' *ugcml'' F guki pcvgf "Wprko kvgf "Nkcdkrkv{ "Rctvpgt." Gpi ci go gpv/Rctvpgt." E gt vkhkgf "Rwdrke" Ceeqwpvcpv''

Y g"j cxg"cwf kgf " y g"eqpuqrlf cvgf "hkpcpekcn"uvcyo gpvu."pco gn{." y g"eqpuqrlf cvgf "dcmpeg"uj ggv."y g"eqpuqrlf cvgf "lucvgo gpv'qh"kpeqo g."y g"eqpuqrlf cvgf "lucvgo gpv'qh"ej cpi gu"kp" uj ctgj qrf gtu) gs wkv{. "gve0cpf "y g"pqvgu"q "eqpuqrlf cvgf "hkpcpekcn"uvcyo gpvu"qh"lf go kuwlMqucp" Eq0"Nvf0'*y g"\$Eqo r cp{\$+:"cr r rkecdrg"vq"ku"eqpuqrlf cvgf "hkuecn"{gct"htqo "Cr tkn"3."4239"vq" O ctej "53."423: "r wtuvcpv'vq'Ctvkerg'666."r ctci tcr j "6"qh"y g"Eqo r cpkgu"Cev'qh"Lcr cp0'

Ocpci go gpv)u'Tgur qpuldlirkv{ 'hqt 'Eqpuqnlf cvgf 'Hlipcpelicn'Ucvgo gpvu''

 $\label{thm:continuous} Vj g''tgur qpuklkık { "qh''y g''Eqorcp } u''o cpci go gpv''ku''vq''r tgr ctg''cpf "r tgugpv''r tqr gtn { "y gug''eqpuqrkf cvgf "hkpcpekcn'uvcvgo gpvu''kp''ceeqtf cpeg''y ky "eqtr qtcvg''ceeqwpvkpi "uvcpf ctf u'' i gpgtcm { "ceegr vgf "kp''Lcr cp0' "Vj ku''kpenwf gu''o ckpvckpkpi "cpf "kortqxkpi "kpvgtpcn''eqpvtqn'' eqpuklf gtgf "pgeguuct { "d { "o cpci go gpv''vq''r tgr ctg''cpf "r tgugpv''r tqr gtn { "y gug''eqpuqrkf cvgf "hkpcpekcn'uvcvgo gpvu''htgg''qh''o cvgtkcn'o kuuvcvgo gpv''d { 'htcwf "qt''gttqt0'' }$

 $C\,wf\,kqtu)\!\!\top\!gur\,qpukdkrkv\!\{\,"$

Qwt 't gur qpukdktk\{ 'ku'\q'gzr t guu'cp''qr kpkqp''qp''y gug''eqpuqnkf cvgf 'hkpcpekcn'uvcyo gpwu' ht qo ''cp''kpf gr gpf gpv'uvcpf r qkpv.''dcugf ''qp''qwt ''cwf kv''eqpf wevgf 0' " Y g''eqpf wevgf ''qwt ''cwf kv''kp'' ceeqt f cpeg'y kyj ''cwf kkkpi ''uvcpf ctf u'i gpgtcm\{ ''ceegr vgf 'kp''Lcr cp0' " Vj qug''uvcpf ctf u'i gs wktg''wu' vq''hqto wrcvg''cp''cwf kv''r rcp''cpf ''eqpf wev'cp''cwf kv''dcugf ''yj gtgqp''vq''qdvckp''tgcuqpcdrg''cuuwtcpeg'' cdqwv'y j gyj gt''yj gug''eqpuqnkf cvgf ''hkpcpekcn'uvcvgo gpvu''ctg''htgg''qh''o cvgt kcn'o kuuvcvgo gpv0'

Kp" cp" cwf kv." r tqegf wtgu" ctg" vcngp" vq" qdvckp" cwf kv" gxkf gpeg" cu" vq" yj g" co qwpv' kp" eqpuqnff cvgf "hkpcpekcn" uvcvgo gpw" cpf "f kuenquwtg" yj gtgqff)' " Cwf kv"r tqegf wtgu. "qp" qwt" qy p" lwf i o gpv." ctg' ugrgevgf "cpf "cr r nkgf "dcugf "qp" qwt "tkum'cuuguuo gpv'qh'o cvgtkcn'o kuuvcvgo gpv'kp" yj g" eqpuqnff cvgf "hkpcpekcn" uvcvgo gpw" d{"htcwf "qt" gttqt0' " Cp" cwf kv'ku" pqv' eqpvgo r ncvgf "vq" gzr tguu" cp" qr kpkqp" qp" yj g" ghhge vkxgpguu" qh'ikpvgtpcn'eqpvtqn') " J qy gxgt. "kp" cuuguukpi "tkum" y g" cuuguu'kpvgtpcn'eqpvtqn't grcvgf "vq" yj g"r tgr ctcvkqp" cpf "r tqr gt"r tgugpvcvkqp" qh'iyj gug" eqpuqnff cvgf "hkpcpekcn'uvcvgo gpw" vq" hqto "c" r ncp" hqt" cf gs wcvg" cwf kv'r tqegf wtgu" ceeqtf kpi "vq" eqpf kkqpu0' " Cp" cwf kv'cnq "kpenwf gu" cuuguukpi "yj g" ceeqwpvkpi "r qnkekgu" cpf "o gyj qf u" qh' cr r nkecvkqp" yj gtgqh' go r m{gf "d{"o cpci go gpv' cpf "guvko cvgu" o cf g"d{"o cpci go gpv." cu" y gm' cu" gxcnwcvkpi "yj g" qxgtcm'eqpuqnff cvgf "hkpcpekcn'uvcvgo gpv'r tgugpvcvkqp0'

 $Y \; g'' dgrkgxg'' y \; cv'qwt'' cwf \; kv'r \; tqxkf \; gu''uwhhkekgpv''cpf \; ''cr \; r \; tqr \; tkcvg'' cwf \; kv''gxkf \; gpeg''hqto \; kpi \; '' \; c'' dcuku''hqt''qr \; kpkqp0''$

Qr kpkqp"

Y g"ctg"qh" yi g"qr kpkqp" yi cv" yi g"cdqxg"eqpuqrkf cvgf "hkpcpekcri' uvcvgo gpvu"r tgugpv"r tqr gtn{"yi g"hkpcpekcri'r qukkkqp"cpf "r tqhkv"cpf "nquu"qh" yi g"eqtr qtcvg"i tqwr "eqor tkugf "qh" kf go kuw! Mqucp"Eq0"Nvf 0'cpf "kvu"eqpuqrkf cvgf "uvvdukf kctkgu"hqt" yi g"r gtkqf "tgrcvgf "vq" yi g"eqpuqrkf cvgf "hkpcpekcri' uvcvgo gpvu"kp"cm"o cvgtkcri' tgur gevu "kp"eqphqto kv{"y kyi "yi g"eqtr qtcvg" ceeqwpvkpi "uvcpf ctf u'i gpgtcm{"ceegr vgf "kp"Icr cp0'

Kpvgt guv'

Qwt'hkto "cpf ''y g'gpi ci go gpv'r ctvpgtu'f q'pqv'j cxg'cp { 'kpvgtguv'kp''y g'Eqo r cp { ''y j kej " uj qwf ''dg'f kuenqugf ''wpf gt''y g'r tqxkukqpu''qh''y g'Egtvkhkgf ''Rwdrke''Ceeqwpvcpv'Cev'qh''Lcr cp0' /'GP F ''/"

$\frac{\text{CWF KVQTU}'\text{TGRQTV'QP'VJ G'P QP/E QP UQNKF CVGF'HKP CPEKCN''}}{\text{UVCVGO GP VU'}}$

<u>IPFGRGPFGPV'CWFKVQTU)TGRQTV</u>"

Oc{"33."423: "

Vq<' Vj g'Dqctf ''qh'F ktgevqtu'' Kt go kuw'Mqucp'Eq0''Nvf0'			
n	F grqkvg"Vqvej g"Vqj o cvuw"NNE"		
n	Mcrrgk'Kuqo eve" *ugcn+" F guki pevgf 'Wprko kvgf 'Nkedkrkv{ 'Retvpgt." Gpi ci go gpv'Retvpgt." Egt \khkgf 'Rwdrke'Ceeqwpvcpv'		
	Fck' co co qvq" *ugcn+" F guki pcvgf "Wprko kvgf "Nkcdkrkv{ "Rct vpgt." Gpi ci go gpv'Rct vpgt." Egt vkhkgf "Rwdrke 'Ceeqwpvcpv'		
п	Oqvq{wnk'Uv wnk' *ugcn+" F guki pcvgf "Wprko ksgf "Nkcdkrkv{ "Rct vpgt." Gpi ci go gpv'Rct vpgt." Egt vkhkgf "Rwdrke "Ceeqwpvcpv"		
II II	P cqcnk'Kpci cnk' *ugcn+" F guki pcvgf "Wpnko kvgf "Nkcdkrkv{ "Rctvpgt." Gpi ci go gpv'Rctvpgt." Egt \khkgf "Rvvdnke'Ceeqwpvcpv'		

 $Y\ g"\ j\ cxg"\ cwf\ kgf"\ ij\ g"\ pqp/eqpuqrkf\ cvgf"\ lkpcpekcn''\ uvcvgo\ gpvu."\ pco\ gn{.}"\ ij\ g"\ pqp/eqpuqrkf\ cvgf"'\ uvcvgo\ gpv'qh''kpeqo\ g."\ ij\ g"pqp/eqpuqrkf\ cvgf"'\ uvcvgo\ gpv'qh''kpeqo\ g."\ ij\ g"pqp/eqpuqrkf\ cvgf"'\ uvcvgo\ gpv'qh''ej\ cpi\ gu''kp''uj\ ctgj\ qrf\ gtu)'gs\ wkv{.}"gve0'cpf''\ ij\ g"pqygu''vq''pqp/eqpuqrkf\ cvgf''hkpcpekcn''\ uvcvgo\ gpvu."cpf''ij\ g"ceeqo\ r\ cp{kpi "uwrrgo\ gpvcn'uej\ gf\ wgu''qh''Kgo\ kxuw''Mqucp''Eq0''Nxf\ 0'*yj\ g"$Eqo\ r\ cp{$+."cr\ r\ rkecdrg''vq'kxu''325tf' lkuecn'{gct'htqo''Crtkrl3."4239'vq'O\ ctej''53."423: 'r\ wtuvcpv''\ vq'Ctvkerg'658."r\ ctci\ tcr\ j''4."kgo''3"qh'yj\ g"Eqo\ r\ cpkgu''Cev'qh''Lcrcp0''$

Ocpci go gpv)u'Tgurqpukdkrkv{'hqt'Hkpcpekcn'Ucvgogpvu.'gve0'

Vj g"tgur qpukdkkk{ "qh'vj g"Eqo r cp{)u"o cpci go gpv"ku"vq"r tgr ctg"cpf "r tgugpv"r tqr gtn{" vj gug"hkpcpekcn'uvcvgo gpvu"cpf "vj g"ceeqo r cp{kpi "uwr r rgo gpvcn'uej gf wrgu"kp"ceeqtf cpeg"y kyj " eqtr qtcvg"ceeqwpvkpi "uvcpf ctf u'i gpgtcm{ "ceegr vgf "kp"Icr cp0" "Vj ku"kpenwf gu"o ckpvckpkpi "cpf" ko r tqxkpi "kpvgtpcn"eqpvtqn"eqpukf gtgf "pgeguuct{"d{"o cpci go gpv"vq"r tgr ctg"cpf "r tgugpv" r tqr gtn{"vj gug"hkpcpekcn'uvcvgo gpvu"cpf "vj g"ceeqo r cp{kpi "uwr r rgo gpvcn'uej gf wrgu"htgg"qh" o cvgtkcn'o kurvcvgo gpv'd{"htcwf"qt"gttqt0"

Cwf kqtu)'T gur qpukdkrkv{"

Qwt" tgur qpukdktk/{ "ku" vq" gzr tguu" cp" qr kpkqp" qp" vj gug" pqp/eqpuqnkf cvgf "hpcpekcn" ucvgo gpwu"cpf "vj g"ceeqo r cp{kpi "uwr r rgo gpv:n'uej gf wrgu"dcugf "qp"qwt"cwf k/"eqpf wevgf 0' "Y g"eqpf wevgf "qwt"cwf k/"kp"ceeqtf cpeg"y kyj "cwf kklpi "uvcpf ctf u"i gpgtcm{ "ceegr vgf "kp"Lcr cp0' "Vj qug"uvcpf ctf u"tgs wktg"wu"vq"hqto wrcvg"cp"cwf k/"r rcp"cpf "eqpf wev/cp"cwf k/dcugf "vj gtgqp"vq" qdvckp"tgcuqpcdrg"cuuwtcpeg"cdqw"y j gvj gt"vj gug"pqp/eqpuqnkf cvgf "hkpcpekcn'uvcvgo gpvu"cpf "vj g"ceeqo r cp{kpi 'uwr r rgo gpvcn'uej gf wrgu"ctg"htgg"qh'o cvgtkcn'o kuuvcvgo gpv0'

Kp"cp"cwf kv."r tqegf wtgu"ctg"vcmgp"vq"qdvclp"cwf kv"gxkf gpeg"cu"vq"yj g"co qwpv"lp"pqp/eqpuqnlf cvgf "hlpcpekcn"uvcygo gpw"cpf "ceeqo r cp{kpi "uwr r rgo gpvcn"uej gf wrgu"cpf "f kuemuwtg" yj gtgqhl)" "C wf kv"r tqegf wtgu."qp"qwt"qy p"lwf i o gpv."ctg"ugrgevgf "cpf "cr r nkgf "dcugf "qp"qwt"tkum" cuuguuo gpv"qh"o cvgtkcn"o kuuvcygo gpv"lp"yj g"pqp/eqpuqnlf cvgf "hlpcpekcn"uvcygo gpw"cpf "yj g" ceeqo r cp{kpi "uwr r rgo gpvcn"uej gf wrgu"d{"hrcwf "qt"gttqt0" "Cp"cwf kv"ku"pqv"eqpvgo r rcvgf "vq" gzr tguu"cp"qr kpkqp"qp"yj g"ghrgevkxgpguu"qh"kpvgtpcn"eqpvtqn0" "J qy gxgt."kp"cuuguukpi "tkum"y g" cuuguu" kpvgtpcn" eqpvtqn" tgrcvgf "vq" yj g"r tgr ctcvkqp" cpf "r tqr gt" r tgugpvcvkqp" qh" yj gug" pqp/eqpuqnlf cvgf "hlpcpekcn"uvcygo gpvu"cpf "yj g"ceeqo r cp{kpi "uwr r rgo gpvcn"uej gf wrgu"vq"hqto "c" rrcp"hqt"cf gs wcvg"cwf kv"t tqegf wtgu"ceeqtf kpi "vq"eqpf kxlqpu0" "Cp"cwf kv"cnq"kpenwf gu"cuuguukpi "yj g"ceeqwpvkpi "r qrkekgu"cpf "o gyj qf u"qh"cr r nkecvlqp"yj gtgqh"go r rq{gf "d{"o cpci go gpv"cpf" gurko cvgu"o cf g"d{"o cpci go gpv."cu"y gm"cu"gxcnwcvkpi "yj g"qxgtcm"r tgugpvcvkqp"qh"yj gug"pqp/eqpuqnlf cvgf "hlpcpekcn"uvcygo gpvu"cpf "yj g"ceeqo r cp{kpi "uwr r rgo gpvcn"uej gf wrgu0"

 $Y g'' dgr kgxg'' \dot{y} \ cv'' qwt'' cwf \ k''r \ tqxkf \ gu''uwhhekgpv'' cpf'' crr \ tqr \ tkcvg'' cwf \ k''gxkf \ gpeg'' hqto \ kpi'' \ c''' dcuku'' hqt'' qwt'' qr \ kpkqp0''$

Qr kpkqp"

 $Y \; g'' \; ctg'' \; qh'' \; vj \; g'' \; qr \; kpkqp'' \; vj \; cv'' \; vj \; g'' \; pqp/eqpuqrkf \; cvgf \; '' \; hkpcpekcn'' \; uvcvgo \; gpwu'' \; cpf \; '' \; vj \; g'' \; ceeqo \; r \; cp \; \{kpi \; '' \; uwr \; r \; go \; gpwcn'' \; uej \; gf \; wrgu'' \; tghgttgf \; '' vq'' \; cdqxg'' \; r \; tgugpv'' \; r \; tqr \; gtn \; '' \; vj \; g'' \; hkpcpekcn'' \; r \; qukkqp''cpf ''r \; tqhkv''cpf '''nquu''qh'' yj \; g''Eqo \; r \; cp \; {''hqt'' yj \; g''r \; gtkqf ''tgrcvgf ''vq'' yj \; g''pqp/eqpuqrkf \; cvgf '' hkpcpekcn''uvcvgo \; gpwu''cpf ''yj \; g''ceeqo \; r \; cp \; {kpi \; ''uwr \; r \; go \; gpvcn''uej \; gf \; wrgu'kp''cm'o \; cvgtkcn''tgur \; gevu''kp'' \; eqphqto \; kv{ ''y \; kyj \; ''yj \; g''eqtr \; qtcvg''ceeqwpvkpi \; 'uvcpf \; ctf \; u'i \; gpgtcm{ ''ceegr \; vgf ''kp''Lcr \; cp0'' }$

Kpvgt guv''

Qwt'hkto "cpf "vj g"gpi ci go gpv'r ctvpgtu"f q"pqv'j cxg"cp{"kpvgtguv'kp"vj g'Eqo r cp{"y j kej " uj qwrf "dg"f kuenqugf "wpf gt"vj g"r tqxkukqpu"qh"vj g'Egtvkhkgf "Rwdrke"Ceeqwpvcpv'Cev'qh"Lcr cp0' /'GPF"/"

VJ G'DQCTF'QH'UVCVWQT['CWFKVQTU)'CWFKV'TGRQTV''

CWF KV'TGRQTV"

"

 $Y g."vj g"Dqctf "qh"Ucwwqt { "Cwf kqtu"qh"vj g"Eqo r cp{."dcugf "qp"vj g"cwf kv"tgr qtv" r tgr ctgf "d{ "gcej "Ucwwqt { 'Cwf kqt"qp"vj g"r gthqto cpeg"d{ "vj g"F ktgewqtu"qh"vj gkt"f wkgu"f wtkpi "vj g"325tf "hkuecn"{ gct "htqo "Cr tkn"3."4239"vq"O ctej "53."423: ."j cxg"r tgr ctgf "vj ku"cwf kv"tgr qtv" wr qp"f grkdgtcvkqp"cpf "j gtgd{ "tgr qtv"cu"hqmqy u<"$

- 30' Ogyj qf "qh"cwf kv"d{ "'yj g"Ucwwqt { "Cwf kqtu"cpf "'yj g"Dqctf "qh"Ucwwqt { "Cwf kqtu"cpf "'yj g" r ctvkewrctu"'yj gtgqh<"
- *3+" Vj g'Dqctf 'qh'Uvcwvqt { 'Cwf kqtu'f gygto kpgf 'ij g'cwf k/r qrke { .'cuuki po gpv'qh'f wkgu'co qpi " y go .'gve0"tgegkxgf 'htqo "gcej "Uvcwvqt { 'Cwf kqt 'tgr qt uu'qp 'ij g'uvcvg''qh'j ku'r gthqto cpeg" qh'cwf ku'cpf 'ij g'tguwnu'ij gtgqh 'cpf 'cnq'tgegkxgf 'htqo 'ij g'F ktgevqtu.'gve0cpf 'ij g'ceeqwpv' cwf kqtu'F grqkxg"Vqwej g"Vqj o cww'NNE "*yj g"\$Ceeqwpv'Cwf kqtu\$+"tgr qt uu'qp "yj g'uvcvg" qh'r gthqto cpeg'qh'ij gkt 'f wkgu'cpf 'f go cpf gf 'ij gkt 'gzr rcpckqpu'y j gpgxgt 'pgeguuct {0'
- *4+" Gcej "Ucwwqt {"Cwf kqt." r wtuwcpv' vq" yi g"twrgu" qh" cwf ku" d {" yi g"Ucwwqt {"Cwf kqtu" f gvgto kpgf "d {" yi g"Dqctf "qh"Ucwwqt {"Cwf kqtu"cpf "kp"ceeqtf cpeg"y kyi "yi g"cwf kv'r qrke {." cuuki po gpv'qh"f wkgu"co qpi "yi go ."gve0"o ckpvckpgf "eqpuvcpv"eqo o wpkecvkqp"y kyi "yi g" F ktgevqtu."yi g"Kpvgtpcri"Cwf kv"Qhhkeg"cpf "qyi gt"go r rq { ggu."gve0'kp"cp"ghhqtv'vq"eqmgev' kphqto cvkqp"cpf "ko r tqxg"yi g"gpxktqpo gpv'hqt"cwf kvkpi "cpf "eqpf wevgf "qwt"cwf ku"kp"yi g" hqmy kpi "o gyi qf u<"
 - *c+" Y g"cwgpf gf "o ggvkpi u"qh"yi g"Dqctf "qh"F ktgevqtu"cpf "qyi gt"ko r qtvcpv"o ggvkpi u."
 tgegkxgf 'htqo "yi g'F ktgevqtu"cpf "go r m{ggu. "gve0tgr qtvu"qp"yi g"uvcvg"qhl" gthqto cpeg"
 qh" yi gkt" f wkgu." f go cpf gf " yi gkt" gzr ncpcvkqpu" y j gpgxgt" pgeguuct {." kpur gevgf "
 ko r qtvcpv" f gekulqp" f qewo gpvu." gve0" cpf " o cf g" kpxguvki cvkqp" kpvq" yi g" uvcvg" qh!
 cevkxkkgu"cpf "r tqr gtv("cv" yi g"j gcf "qhhkeg"cpf "r tkpekr cn"dwukpguu"qhhkegu"qh" yi g"
 Eqo r cp{0' " Y kyi " tgi ctf" vq" kvu" uvdukf kctkgu." y g" o ckpvckpgf " eqpuvcpv"
 eqo o wpkecvkqp"cpf "gzej cpi gf "kphqto cvkqp"y kyi "yi g"f ktgevqtu."uvcwwqt {"cwf kvqtu."
 gve0' yi gtgqh" cpf "tgs wktgf" yi g" uvdukf kctkgu" vq" tgpf gt" tgr qt vu" qp" yi gkt" dwukpguu"
 qr gtcvkqpu'y j gpgxgt"pgeguuct {0'
 - *d+" Y kj "tgi ctf " vq" y g" f gvckru" qh" y g" tguqnwkqpu" qh" y g" Dqctf " qh" F ktgevqtu" hqt" guvcdrkuj kpi "u{uvgo u"vq"ugewtg"y cv'y g"r gthqto cpeg"d { "vj g"F ktgevqtu"qh"y gkt "f wkgu" y knieqo r n{ "y ky "rcy u"qt"qtf kpcpegu"cpf "vj g"Ctvkergu"qh"kpeqtr qtcvkqp"cu"f guetkdgf " kp" y g" dwukpguu" tgr qtv" cpf " uwej " qvj gt" u{uvgo u" r tqxkf gf " hqt" kp" Ctvkerg" 322." r ctci tcr j u"3"cpf "5"qh"y g"Tgi wcvkqpu"vq"Gphqteg"y g"Eqo r cpkgu"Cev'qh"Lcr cp"cu" pgeguuct { "vq"ugewtg" y g"cf gs wce { "qh"dwukpguu"qh"c"eqtr qtcvg"i tqwr "eqo r tkukpi "c" lqkpvuvqenieqtr qtcvkqp"cpf "ku"uvdukf kctkgu."cu"y gnicu"y g"u{uvgo u"*kpvgtpcnieqpvtqn" u{uvgo u+"guvcdrkuj gf "r wtuwcpv'vq"uwej "tguqnwkqpu."y g"tgegkxgf "htqo "vj g"F ktgevqtu." go r m{ ggu. "gve0"tgr qtvu"qp"c"tgi wct "dcuku." f go cpf gf "y gkt"gzr rcpcvkqpu"y j gpgxgt" pgeguuct { ." cpf " gzr tguugf " qwt " qr kpkqpu." qp" y g" uvcwu" qh" y g" hqto wcvkqp" cpf " qr gtcvkqp"qh"y g"u{uvgo u0" Y ky 'tgi ctf "vq'kpvgtpcnieqpvtqniqxgt'hkpcpekcnitgr qtvkpi ." y g"tgegkxgf "htqo "y g"F ktgevqtu."gve0'cpf "y g"Ceeqwpv'Cwf kvqtu"tgr qtw"qp"y g"vcvg" qh" gxcnwcvkqp" cpf " cwf kwu" qh" y g" kpvgtpcni eqpvtqni cpf " f go cpf gf " gzr rcpcvkqpu"

y j gpgxgt 'pgeguuct {0'

- *e+" Y ký 'tgi ctf ''vq''y g'hwpf co gpvcn'r qrke { ''wpf gt ''Ctvkerg''33: .'r ctci tcr j ''5.''ksgo ''*c+"qh'' y g''Qtf kpcpeg'hqt ''Gphqtego gpv'qh''y g'Eqo r cpkgu''Cev'cu'f guetkdgf ''kp''y g''dwukpguu'' tgr qtv.''y g.''vcnkpi ''kpvq''eqpukf gtcvkqp''y g'f grkdgtcvkqpu''y gtgqh ''gve0'd { ''y g''Dqctf ''qh'' F ktgevqtu''qt''qy gty kug. ''kpxguvki cvgf ''y g''eqpvgpv'y gtgqh0'
- *f+" Y g"cnıq"o qpkqtgf "cpf "xgtkhkgf "y j gy gt"y g"Ceeqwpv'Cwf kqtu"j cf "o ckpvckpgf "cp" kpf gr gpf gpv" r qukkqp" cpf " eqpf wevgf " cf gs wcvg" cwf kuı." cpf " tgegkxgf " htqo " y g" Ceeqwpv'Cwf kqtu"tgr qt vu"qp"y g"uvcvg"qh"r gthqto cpeg"qh"y gkt "f wkgu"cpf "f go cpf gf " yi gkt" gzr ncpcvkqpu" y j gpgxgt" pgeguuct {0' " Kp" cf f kkqp." y g" tgegkxgf " htqo " yi g" Ceeqwpv'Cwf kqtu"c"pqvkeg"y cv\\$u{uvgo u"vq"ugewtg"cf gs wcvg"r gthqto cpeg"qh"f wkgu\\$" *cu"rkuvgf "kp"y g"kgo u"qh"Ctvkerg"353"qh"y g"T wrgu"qh"Eqtr qtcvg"Ceeqwpvkpi +"j cf " dggp"guvcdrkuj gf "kp"ceeqtf cpeg"y ky "yi g"\$Uvcpf ctf "hqt"S wcrkv{ "Eqpvtqn"Eqpegtpkpi " Cwf ku\\$" *yi g" Ceeqwpvkpi " Uvcpf ctf u" Dqctf " qh" Lcr cp. " Qevqdgt" 4: ." 4227+" cpf " f go cpf gf "yi gkt"gzr ncpcvkqpu"y j gpgxgt"pgeguuct {0'

Kp" ceeqtf cpeg" y kj " uwej " o gyj qf u." y g" kpxgurki cygf " y g" dwukpguu" tgr qtv' cpf " ku" uwr r rgo gpvcn' uej gf wrgu." y g" pqp/eqpuqrkf cygf "hkpcpekcn' uvcygo gpvu" *y g" pqp/eqpuqrkf cygf " dcrcpeg" uj ggv." y g" pqp/eqpuqrkf cygf " uvcygo gpv'qh' kpeqo g." y g" pqp/eqpuqrkf cygf " uvcygo gpv'qh' ej cpi gu'kp" uj ctgj qnf gtu) 'gs wkw{ ."gve0'cpf " y g" pqvgu" 'q " pqp/eqpuqrkf cygf "hkpcpekcn' uvcygo gpvu" " y gkt" ceeqo r cp{kpi " uwr r rgo gpvcn' uej gf wrgu." cu" y gm' cu" y g" eqpuqrkf cygf " hkpcpekcn' uvcygo gpvu" *y g" eqpuqrkf cygf " dcrcpeg" uj ggv." y g" eqpuqrkf cygf " uvcygo gpv' qh' kpeqo g." y g" eqpuqrkf cygf " uvcygo gpv' qh' y g" eqpuqrkf cygf " uvcygo gpv' qh' y g" eqpuqrkf cygf " uvcygo

- 40' Tguwnu'qh'cwf kx
- *3+" Tguwnu'qh'cwf kv'qh'vj g'dwukpguu'tgr qtv.''gve0\t'
 - Y g'ctg'qh'y g'qr kpkqp<'
 - *c+" Vj cv'ij g'dwukpguu'tgr qtv'cpf 'kwu'uwr r rgo gpvcn'uej gf wrgu'r tgugpv'hcktn{ ''y g'uvcvg''qh''ij g'' Eqo r cp{ ''kp''ceeqtf cpeg''y kyj ''rcy u''qt ''qtf kpcpegu''cpf ''y g''Ctvkergu''qh''Kpeqtr qtcvkqp="
 - *d+" Vj cvkp'eqppgevkqp'y kij 'ij g'r gthqto cpeg'd { 'ij g'F ktgevqtu'qh'ij gkt'f wkgu. 'pq'f kuj qpguv' cev'qt 'o cvgtkcnhcev'qh'xkqncvkqp'qh'ncy u'qt 'qtf kpcpegu'qt'y g'Ctvkengu'qh'kpeqtr qtcvkqp" gzknvu="
 - *e+" Vj cv''y g"f gvcku''qh''y g"tguqnwkqpu''qh''y g"Dqctf "qh"F ktgevqtu''qp"kpvgtpcn''eqpvtqn'' u{uvgo u" ctg" r tqr gt" cpf " yi cv'' yi g" f guetkr vkqpu'' kp" yi g" dwukpguu'' tgr qtv'' cpf " yi g" r gthqto cpeg'd{''yi g'F ktgevqtu''qh''yi gkt'f wkgu''eqpegtpkpi 'luvej 'kpvgtpcn''eqpvtqn'lu{uvgo u" eqpvckp"pqyi kpi "vq"dg"r qkpvgf "qw0' " Y kyi "tgi ctf "vq"kpvgtpcn''eqpvtqn''qxgt"hkpcpekcn'' tgr qtvkpi .'y g'j cxg'tgegkxgf 'htqo "yi g'F ktgevqtu.''gve0'cpf "yi g'Ceeqwpv'Cwf kqtu'tgr qtvu" yi cv'yi gtg''gz kuvu''pq''o cvgtkcn'lkpcf gs wce{"vq"dg'f kuemqugf "cv'yi g'Vko g''qh''r tgr ctkpi "yi ku" cwf kv'tgr qtv='cpf"
 - *f+" Vj cv'' yj g"hwpf co gpvcn''r qrke{"qp" yj g"kf gcn''qh'' yj g"r gtuqpu" yj q"uj cm''eqpvtqn'' yj g"f gvgto kpcvkqp"qh'hkpcpekcn'cpf ''dwukpguu''r qrkekgu''qh''yj g"Eqorcp{"cu''f guetkdgf ''kp''yj g"dwukpguu''tgr qtv''eqpvckpu''pqyj kpi ''vq''dg''r qkpvgf ''qw0'

(2) Results of audit of the non-consolidated financial statements and their accompanying supplemental schedules:

We are of the opinion that the method and results of the audit made by the Account Auditors are proper.

(3) Results of audit of the consolidated financial statements:

We are of the opinion that the method and results of the audit made by the Account Auditors are proper.

May 14, 2018

The Board of Statutory Auditors Idemitsu Kosan Co., Ltd.

Takanori Kuniyasu	(seal)
Full-time Statutory Auditor	
J	
a	
Sakae Hirano	(seal)
Full-time Statutory Auditor	
•	
Taigi Ito	(seal)
(Outside) Statutory Auditor	
` '	
G1 1 1 1 2 2 1	
Shoichiro Niwayama	(seal)
(Outside) Statutory Auditor	

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