

Fj Zhi ʔdc°9°+ZV- X' ([

6hhZhhb Zci	I Zhi	9db V'c	H' ʔaa	9^ Xj ʔn
H6l	GZWʔc\ VcY'L gʔʔc\	HiVcYVgʔ': c\ah]	7dj cYVgZh	
		8dckZci ʔdch		



I

6beeXVg4afj Xe-7

ETgbaT_X

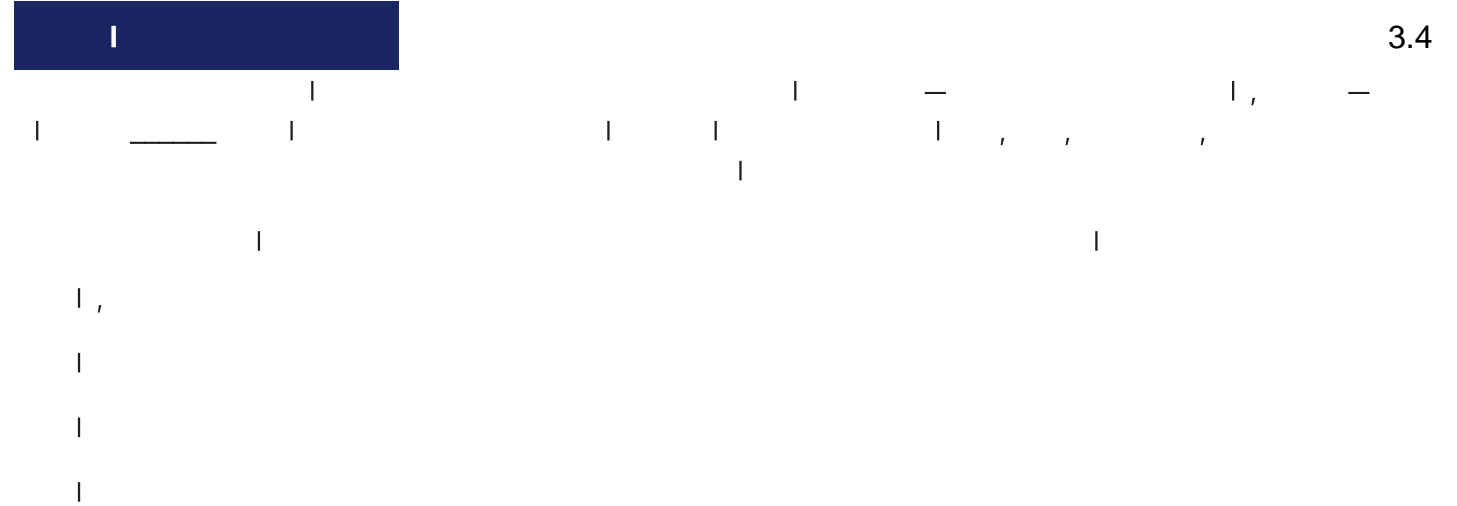
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G[X'g' b'X_X' Xagf''[bj ÅeXZ\ba f°TaW"j [TgÅbVXTa°'j be^gbZXg' XeTf VbbeWaTgXf'gb'Vb` c_Xg'g' X'WkfVc'g'ba
bYj [Tgg' X'g'X' j Tf TU_X'gb'W'g'Xe` ʔaX!5XVThfX'g' XeX'TeX'ba_ 'g' b'VbbeWaTgXf'ʔa'g' ʔf'VTfX'f'f'f'bccbfXWgbT
fXeXf'bYg' eXX'be` beXfZab'chaVghTgba ʔf'aXXWkWUXg XXa'g' X' !

6[b\X'4'ʔf'ʔaVbeeXVgUXVThfX'ab'chaVghTgba ʔf'aXXWkWUXg XXa'g' X'VbbeWaTgXf''[bj ÅeXZ\ba f°TaW"j [TgÅ
bVXTa!'6[b\X'5'ʔf'ʔaVbeeXVgUXVThfX'ab'chaVghTgba ʔf'aXXWkWUXg XXa'g' X'VbbeWaTgXf''[bj ÅeXZ\ba f°TaW
"j [TgÅbVXTa!'6[b\X'6'ʔf'ʔaVbeeXVgUXVThfX'ab'chaVghTgba ʔf'aXXWkWUXg XXa'g' X'VbbeWaTgXf''[bj ÅeXZ\ba f°
TaW"j [TgÅbVXTa!'

DhXfgba 7\EVh_g -; TeW

Fj Zhi ʔdc°9°WW) V(W

6hhZhhb Zci	I Zhi	9db Vʔc	H ʔaa	9^ Xj ʔn
H6l	GZWʔc\ VcYʔL gʔʔc\	HiVcYVgʔʔ: c\ʔhʔ 8dckZci ʔdch	7dj cYVgZh	



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6beeXVg4afj Xe-7

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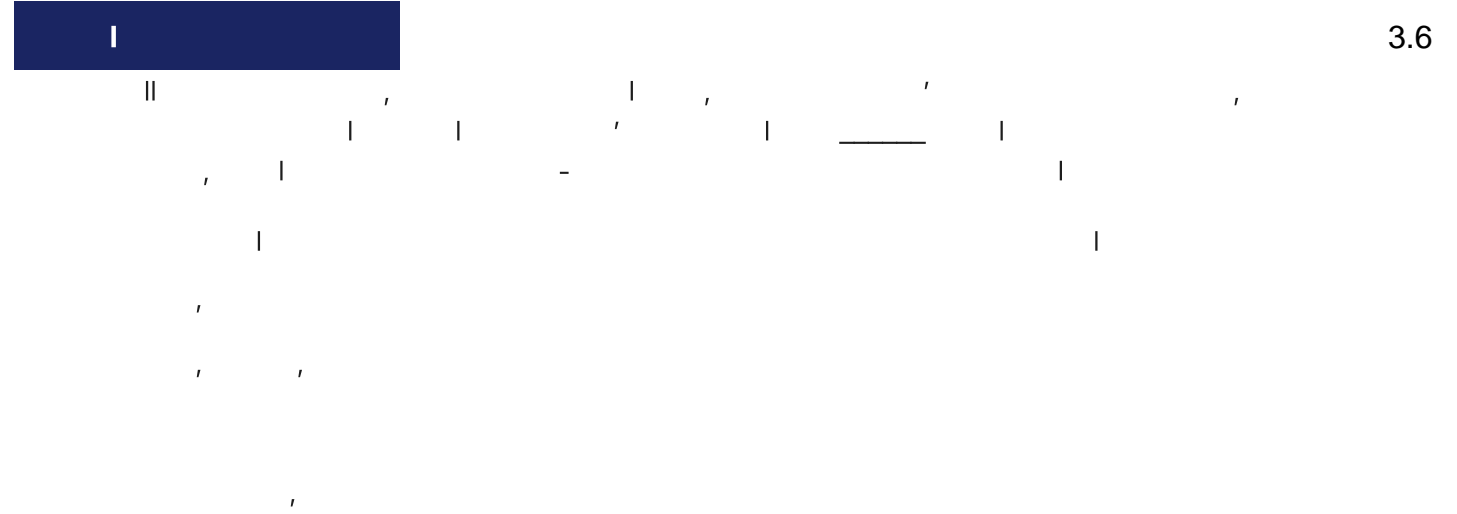
6[bWX'7'f'g' X'UXfgTafj Xd'G[X'aVWcXaVWagV_JhfXf'`exfXTev[Xe?'a'M' V\^f\^`TaW'UI VVfb_j'aZ\A%: CT`VTa UX'ZeT` ` TgVT_ 'fXcTeTgXWUI T'cXebW'G[XI VTa'fgTaWT_baXTf'fXagXaVXfZTaWg'f'f'g' X'ba_ V[bWX'g' Tg _Xg'g' X' Wb'g' Tg

6[bWX'4'f'aVbeeXVg'G[f'V[bWX'exfh_g'`a'T'ZeT` ` TeXeebeVT_XWT'Vb` ` T'fc_VX!'`EXfXTev[Xe?'a'M' V\^f\^`TaW'UI VVfb_j'aZ\A%: CT`TeX'Ub'g' `aVWcXaVWagV_JhfXf'G[XI 'aXXW'g'X'g' XeUX'fXcTeTgXWj' `g' `chaVghTgba _^XT'cXebWbeT'fX' `Wb_baZbe'g' XI 'aXXW'g'UX'VbaaXVgXWUI T'Vb` ` T'TaWT'VbbeWaTgaZ'Vba]haVgba_^X `TaW'`4'Vb` ` T'T_baX'fa'gXabhZ[!6[bWX'5'f'aVbeeXVg'G[f'V[bWX'exfh_g'`a'T'ZeT` ` TeXeebeVT_XWT'ehaz ba'fXagXaVX!'`EXfXTev[Xe?'a'M' V\^f\^`TaW'UI VVfb_j'aZ\A%: CT`TeX'Ub'g' `aVWcXaVWagV_JhfXf'G[XI 'aXXW'g'X'g' XeUX'fXcTeTgXWj' `g' `chaVghTgba_^XT'cXebWbeT'fX' `Wb_baZbe'g' XI 'aXXW'g'UX'VbaaXVgXWUI T'Vb` ` T'TaWT'VbbeWaTgaZ'Vba]haVgba_^X`TaW'6[bWX'6'f'aVbeeXVg'G[f'V[bWX'exfh_g'`a'T'ZeT` ` TeXeebeVT_XW T'ehazba'fXagXaVX!'`EXfXTev[Xe?'a'M' V\^f\^`TaW'UI VVfb_j'aZ\A%: CT`TeX'Ub'g' `aVWcXaVWagV_JhfXf'G[X VbbeWaTgaZ'Vba]haVgba`TaW'fa'gXabhZ[`g'_a^`g' X' UI `g'X_!`J X'aXXWT'Vb` ` TZgbb!

DhXfgba'7\^Vh_g -; TeW

Fj Zhi ʔc°9°, . %X(++

6hhZhhb Zci	I Zhi	9db Vʔc	Hʔ ʔaa	9^ Xj ʔn
H6l	GZWʔc\ VcYʔL gʔʔc\	HiVcYVgʔʔ: c\ʔh]	7dj cYVgZh	
		8dckZci ʔdch		



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6beeXVg4afj Xe-4

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6[b\X'4'ʔf'g' X'UXfgTafj Xd'G[ʔf'V[b\X'hfXf T'fX' \Wb_ba'gb]b'a'g' b'a\XcXa\XagV_ThfXf'fiA T^T_X' UX WbXfa'g]hfg'g' bhZ[°TaW'f[XT_fb'f[Tef!!!ʔʔG[ʔf'V[b\XT_fbTccebceTgX_ ʔaV_h\Xf'°g' bhZ[°ʔa'g' X'Eefg V_ThfXZj [Xe'g'_bZ\WT_ ʔUX_baZf!

6[b\X'5'ʔf'ʔaVbeeXVg'G[ʔf'V[b\X'eXfh_g' ʔa'TZeT' ° TeXeebeVT_XWT'Vb' ° T'fc_VX!'g'ʔaVbeeXVg_]b'a'f'g' b'a\XcXa\XagV_ThfXf'j 'g' ʔba_ T'Vb' ° T'a'fgXTWbYT'Vb' ° T TaWT Vbbe\WaTgaZ Vba]haVgba'_^X'°TaW'be °Uhg'°G[bhZ[°ʔf' T'geTaf'g'ba'j be\Uhg'g'f' a'bgT Vbbe\WaTgaZ Vba]haVgba!'6[b\X'6'ʔf'ʔaVbeeXVg'G[ʔf'V[b\X'eXfh_g' ʔa'T'chaVghTgba'Xeebe'4'fX' \Wb_ba VTa'ba_ ʔUX'hfXWgb_ʔa^'g' b'a\XcXa\XagV_ThfXf'!; bj Xi XeZ'Y °g' bhZ[°ʔf'ʔaV_h\XW\Wa'g' X'fXVbaWW_ThfXZ'g'g'heaf'g' X'fXVbaWW_ThfX'agb T WkXa\XagV_ThfXZfb T'fX' \Wb_ba VTa'g'UX'hfXWT'g'Xe'ʔaYbe' Tgba!'6[b\X'7'ʔf'ʔaVbeeXVg'G[ʔf'V[b\X'eXfh_g' ʔa'TZeT' ° TeXeebeVT_XWT'Vb' ° T'fc_VX!'g'ʔaVbeeXVg_]b'a'f'g' b'a\XcXa\XagV_ThfXf'j 'g' ʔba_ T'Vb' ° T'a'fgXTWbYT'Vb' ° T TaWT Vbbe\WaTgaZ Vba]haVgba'_^X'°TaW'be°Uhg'

DhXfgba'7\ŒVh_g -; TeW

Fj Zhi ʔc°9*. %) Y- ,

6hhZhhb Zci	I Zhi	9db Vʔc	H ʔaa	9^ Xj ʔn
H6l	GZWʔc\ VcYL gʔc\	HiVcYVgʔ: c\ah]	7dj cYVgZh	

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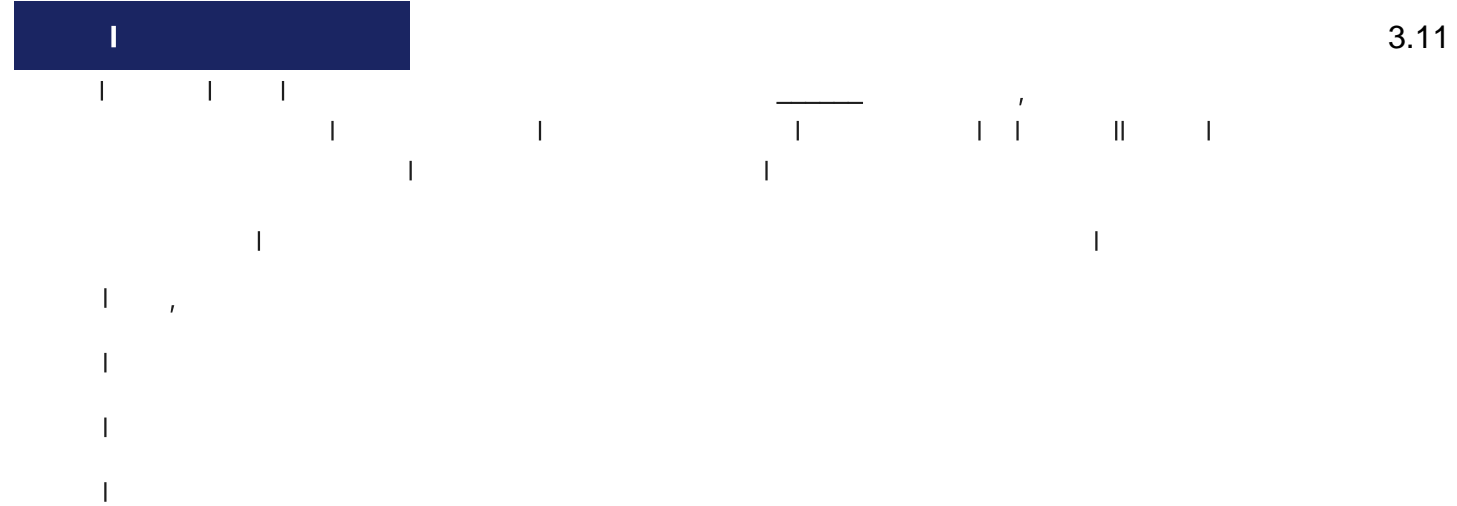
6[b\WX'4'f'g' X'UXfgTafj Xd'G[f' V[b\WX'hfXf T Vb` ` T TaWT VbbeWaTgaZ Vba]haVgba fTaWag]b'a'g b
VaWkcXaWkagV_ThfXf fG[X'GTagTdhWZXbaA'GeUX'JaWGbWTI A'Vbhagel 1/2

6[b\WX'5'f' VaVbeeXVg'G[f' V[b\WX'exfh_g' Va T ZeT` ` TeXeebe^abj a Tf T'ehazba fXagKaVX! G[X'V_ThfXf 'UXYbeX
TaWTYGe'GeUX'Ja'ex'Ubg' VaWkcXaWkag'f'g' Xi aXXWgb UX'fXcTeTgXWj \g' f'b` X'fbegbYchaVghTgba! 6[b\WX'6'f'
VaVbeeXVg'G[f' V[b\WX'exfh_g' Va T ZeT` ` TeXeebe^abj a Tf T'ehazba fXagKaVX! G[X'V_ThfXf 'UXYbeX TaWTYGe
1/4aWJa'ex'Ubg' VaWkcXaWkag'f'g' Xi VTa'gUX'_a^XWj \g']hfgT Vba]haVgba! 4 Vb` ` Tj bh_WT_fb'UX'exdh'exW
6[b\WX'7'f' VaVbeeXVg'G[f' V[b\WX'exfh_g' Va T ZeT` ` TeXeebeVT_XWT Vb` ` T'fc_WX! G[X'V_ThfXf 'UXYbeX TaW
TYGe'GeUX'Ja'ex'Ubg' VaWkcXaWkag'f'g' Xi VTa'gUX'_a^XWj \g']hfgT Vb` ` T! 4 VbbeWaTgaZ Vba]haVgba '_^X
1/4aWbe'Whg'3 bh_WT_fb'UX'exdh'exW

DhXfgba '7\EVh_g -; TeW

Fj Zhi ʔdc°9*.) WYV.)

6hhZhhb Zci	I Zhi	9db Vʔc	H ʔaa	9^ Xj ʔn
H6l	GZWʔc\ VcYʔL gʔʔc\	HiVcYVgʔʔ: c\ʔhʔ 8dckZci ʔdch	7dj cYVgZh	



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6beeXVg4afj Xe-5

ETgbaT_X

6[b\WX'5'ʔf'g' X'UXfgTafj Xed'ʔTeX'g' Tec'ʔʔf' XffXagT_ʔaYbe' Tgba'g' TgVb` c_XgXf'g' X'EefgV_ThfX'ʔ'g' X'Eefg V_ThfX'WbXfa'g'YhaVgba'j' g' bhg'g'Fbj' X'Wba'g'j' Taggb'f'XcTeTgX'g'j' g' chaVghTgba!N

6[b\WX'4'ʔf'ʔaVbeeXVg'G[ʔf'V[b\WX'VeXTgXf' T'chaVghTgba'Xeed'ʔG[X'EX_WbYZXb_bZWT_bVXTabZeTc[I'bj' Xf` hV['gp'4` XeVTa'ZXb_bZVfg'ʔf'haV_XTe-j [W['ZXb_bZVfgTeX'j' X'gT_ʔaZ TUbhg2J' X'aXXWg' X'ʔTeX'G[Tec'ʔʔbe V_Te'g'Zj [W[` XTaf'g'f'XffXagT_ʔaYbe' Tgba TaWf[bh_WabgUX'f'XcTeTgXWUI T'Vb` ` T!N[b\WX'6'ʔf'ʔaVbeeXVg G[ʔf'V[b\WX'VeXTgXf' T'chaVghTgba'Xeed'ʔG[X'EX_WbYZXb_bZWT_bVXTabZeTc[I'bj' Xf` hV['gp'4` XeVTa ZXb_bZVfg'ʔf'haV_XTe-j [W['ZXb_bZVfgTeX'j' X'gT_ʔaZ TUbhg2J' X'aXXWg' X'ʔTeX'G[Tec'ʔʔbeV_Te'g'Zj [W[` XTaf'g'f'XffXagT_ʔaYbe' Tgba TaWf[bh_WabgUX'f'XcTeTgXWUI T'fX` Wb_ba!N[b\WX'7'ʔf'ʔaVbeeXVg'G[ʔf'V[b\WX'VeXTgXf' T'chaVghTgba'Xeed'ʔG[X'EX_WbYZXb_bZWT_bVXTabZeTc[I'bj' Xf` hV['gp'4` XeVTa ZXb_bZVfg'ʔf'haV_XTe-j [W['ZXb_bZVfgTeX'j' X'gT_ʔaZ TUbhg2J' X'aXXWg' X'ʔTeX'G[Tec'ʔʔbeV_Te'g'Zj [W[` XTaf'g'f'XffXagT_ʔaYbe' Tgba TaWf[bh_WabgUX'f'XcTeTgXWUI T'Vb_ba!N

DhXfgba'7\WVh_g -; TeW

Fj Zhi ʔdc°9[YW&+Z' %

6hhZhhb Zci	I Zhi	9db V'c	H' ʔaa	9^ Xj ʔn
H6l	GZWʔc\ VcY'L gʔʔc\	HiVcYVgʔ': c\ʔh]	7dj cYVgZh	
		8dckZci ʔdch		



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6beeXVg4afj Xe-5

ETgbaT_X

6[b\WX'5\ʔf'g\ X'UXfgTafj Xed'G[ʔf'V[b\WX'hfXf'cT\exWchaVghTgba\ʔa'g\ X'ʔbe' bYg' bVb' ʔ Tf'gpfXgbWg\ X
abaXffXagT_c[eTfXʔ\ʔa'g\ X'cebVXff'!

6[b\WX'4\ʔf'\ʔaVbeeXVg'G[X'c[eTfXʔ\ʔa'g\ X'cebVXff'ʔf'T'abaXffXagT_X_X' XagTaWaXXW'g\UXfXgbWj' \g\ cT\exW
chaVghTgba!J X'aXXWT'Vb' ʔ TTYgeʔTaW'g\ TgV[g\ X'baXTYgeʔcebVXff'! 6[b\WX'6\ʔf'\ʔaVbeeXVg'G[X'c[eTfX
ʔ\ʔa'g\ X'cebVXff'ʔf'T'abaXffXagT_X_X' XagTaWaXXW'g\UXfXgbWj' \g\ cT\exWchaVghTgbaZfbj Xj bh_WaXXWT
Wtf[TYgeʔTaW'g\ TgV[g\ X'baX'Yb_bj \ʔaZʔcebVXff'! 6[b\WX'7\ʔf'\ʔaVbeeXVg'G[X'c[eTfXʔ\ʔa'g\ X'cebVXff'ʔf'T
abaXffXagT_X_X' XagTaWaXXW'g\UXfXgbWj' \g\ cT\exWchaVghTgba!J Xj bh_WaXXWT'Vb' ʔ TTYgeʔcebVXff'
g\ TgV[g\ X'baX'Yb_bj \ʔaZʔTaW'

DhXfgba'7\VEVh_g -; TeW

Fj Zhi ʔc°9[- +- Y) (-

6hhZhhb Zci	I Zhi	9db Vʔ	Hʔ ʔaa	9^ Xj ʔn
H6l	GZWʔc\ VcYʔL gʔʔc\	HiVcYVgʔʔ: c\ʔhʔ 8dckZci ʔdch	7dj cYVgZh	

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6beeXVg4afj Xe-6

ETgbaT_X

6[b\X'6'ʔf'g' X'UXfgTafj Xe'G[X'Vbai Xagba 'UX'aZ'gXfgXWf'chaVghTgba 'UXg' XXa T'fhU]XVgTaWT'i XeU!'A b
chaVghTgba 'ʔ'aXXWkWj [Xa'g' X'fhU]XVgbYT'fXagXaVX'ʔ'` XWXTgX_ Yb_bj XWUI T` T'a'i XeU!'a'g' ʔ' ʔTfXZ'g' X
fXagXaVX'f'fhU]XVgf'g' X'aabi Tgi Xj be^f' bY6baZb_XfX'fVh_cgbeTaWTeV[VgXVg5bWf'f'X^>'aZX_Xm'ʔ' Yb_bj XW
UI 'g' X` T'a'i XeU!'ʔ' XeX'XTgheXWZ'aWab'chaVghTgba 'f[bh_WWb` X'UXg' XXa'g' X' !

6[b\X'4'ʔf'ʔaVbeeXVgUXVThfX'ab'chaVghTgba 'ʔ'aXXWkWUXg' XXa'g' X'fhU]XVgTaWg' Xi XeU!'6[b\X'5'ʔf'
ʔaVbeeXVgUXVThfX'ab'chaVghTgba 'ʔ'aXXWkWUXg' XXa'g' X'fhU]XVgTaWg' Xi XeU!'6[b\X'7'ʔf'ʔaVbeeXVgUXVThfX
ab'chaVghTgba 'ʔ'aXXWkWUXg' XXa'g' X'fhU]XVgTaWg' Xi XeU!

DhXfgba 7\VEVh_g -; TeW

Fj Zhi ^{dc} 9 + Y) WZ&Z

6hhZhbb Zci	I Zhi	9db V'c	H' 'aa	9^ Xj 'an
H6l	GZW'c\ 'VcY'L g'f'c\	Hi VcYVg'': c\ah] 8dckZci 'dch	7dj cYVgZh	

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6beeXVg4afj Xe7

ETgNbaT_X

6[bWX'7'f'g' XUXfgTafj' Xd'G[X'Vbai Xagba'UX'aZ'gXfgXWf'g' X'hfX'bYchaVghTgba'UX'g' XXa'gg'Xf TaWcebcXe
abhaf!Ab'chaVghTgba'f'aXXVXWg'fXgbYg' X'cebcXe'abha''J T^T^b'LT' ThV[\`Yeb'` g' X'gg'X'g' TgWkfVeUXf
LT' ThV[V'c'baXXe'aZ'c_Tl j eZ[g'5XVThfX'J T^T^b'LT' ThV[\`f'XffXagT_`aYbe' Tgba'W'WagM'`aZ'g' X
`c'baXXe'aZ'c_Tl j eZ[g'ab'chaVghTgba'f'aXXffTel!

6[b\WX'4`f`aVbeeXVgUXVThfX`ab'chaVghTgba`f`aXXWkWUXYbeX`beTYge'g`X`cebcXe'abha`J`T^T^b`LT`ThV[V`
FXggaZ`g`X`c`Tl`j`eZ[g`f`aT`X`bWj`V`g`Vb` `Tf`fhZZXf`g`g`Tg`gVbh_WUX`eX`bi`XWj`V`g`bhgTYWVgaZ`g`X`
Vb[XeXaVX`bYg`X`fXagXaVXZj`[W[`f`a`g`g`X`VTfX!`6[b\WX'5`f`aVbeeXVgUXVThfX`ab'chaVghTgba`f`aXXWkW`
UXg`XXa`g`X`g`gX`c`baXXeXaZ`c`Tl`j`eZ[g`TaWg`X`cebcXe'abha`J`T^T^b`LT`ThV[V`6[b\WX'6`f`aVbeeXVg`
UXVThfX`ab'chaVghTgba`f`aXXWkWUXg`XXa`g`X`cebcXe'abha`J`T^T^b`LT`ThV[V`TaWg`Xi`XeU`Vb`c`TeXf`!

DhXfgba 7 \E Vh_g -; TeW

Fj Zhi 'dc°9`WY** , X[

6hhZhbb Zci	I Zhi	9db V'c	H' 'aa	9^ Xj an
H6l	GZW'c\`VcY`L g'f'c\`	HiVcYVgY': c\`ah] 8dckZci 'dch	7dj cYVgZh	

9/WY** , X[

3.16

I] Z'gZa/i 'dch] 'e`WZil ZZc`^Zcdb Zh`VcY`Ze^Zcdb Zh`gZkZVh`] dl `XZah1 1] °YZci XVa9C6`YZkZade`Y{[ZgZci TTTTTT1] ZgZVh i] Z`^Zcdb Z`^c`ZVX] `XZaXdciv`chV`Xdb eZiZ`9C6`hZfj ZcXZ!i] Z`Ze^Zcdb Z`Xdch`hih'd[X] Zb `XVaXdb edj cYh'i] Vi YZiZgb `cZ1] X] igV'fh`c'i] Z`hZfj ZcXZ1 `aW`ZnegZhhZY#

L] X] X] d`XZ`Xdb eZiZhi] ZiZni`hd'i] Vi`f`Xdc[dgb h'i'd'i] Z`XdckZci 'dch'd[HiVcYVgY': c\`ah] 4

6#[j cXi 'dch

7#[j cXi 'dch!

8#[j cXi 'dch`VcY!

9#[j cXi 'dch/

9/WY** , X[°6chl Zg

8dggZXi°6chl Zg'9

GVi 'dcVZ

8] d`XZ`9`h'i] Z`WZhi`Vchl Zg#] Z`XdckZci 'dc`WZ`c\`iZhiZY`h'i] Z`j hZ`d[V`Xdadc1 1] `c`V`hZciZcXZ#e'i] `hX] d`XZ!i] Z`Xdadc XdggXian`c'iglyj XZh'i] Z`[daadl `c\`Znea/cVi 'dc'd[i] Z`Y{[ZgZci`ij cXi 'dch'd[\`Zcdb Zh`VcY`Ze^Zcdb Zh#

8] d`XZ`6`h`c`XdggZXi`WZXVj hZ`f`gZhj ah`c`V`g c`dc`hZciZcXZ#] Z`il d`b V`c`Xa/j hZh`L] Z`gZa/i 'dch] 'e [j cXi 'dch`VcY`L] ZgZVh ZnegZhhZY.f`Vg`ij hZY1 1] dj i`ej cXij Vi`dc`VcY\$dgV`Xdc.j cXi 'dc#8] d`XZ`7`h`c`XdggZXi`WZXVj hZ`f`gZhj ah`c`V`Xdb b V`heaXZ#6`Xdb b V`XVci`WZ`j hZY`c'i] h1 Vni'd`_d`c`il d`b V`c`Xa/j hZh`L] Z`gZa/i 'dch] 'e [j cXi 'dch`VcY`.l] ZgZVh ZnegZhhZY.f#8] d`XZ`8`h`c`XdggZXi#L 1] dj i`V`Xdb b V`eg`XZY`c\`!i] Z`Xdc.j cXi 'dc`VcY`XVci`WZ`j hZY`c'i] h1 Vni'd`_d`c`il d b V`c`Xa/j hZh#; j g] Zgb dgZ!.VcY.[V`h'i'd`cY`XViZ'i] Vi1] Vi[dadl h`h`Vc`Znea/cVi 'dc'd['] dl `XZah1 1] °YZci XVa9C6`YZkZade`Y{[ZgZci`ij cXi 'dch#

Fj Zhi 'dc°9^ Xj an/=VgY

Fj Zhi 'dc°9°D * VZ) %

6hhZhhb Zci	I Zhi	9db V'c	H' 'aa	9^ Xj an
H6l	GZW'c\ VcY'L g't'c\	HiVcYVgY': c\ah]	7dj cYVgZh	
		8dckZci 'dch		

9°D * VZ) %

3.17

I] Z`X†n'd[°6b hiZgYVb °eVjcZgY¹ †] `Xdchj áVcihĩd`YZkZade`Ej WdX: nZ Vc`Zi] `XVa6>edl ZgZY`Xgdl Y"b dc†dgc\ TTTTT kYZd`hi gZVb ZY`[gdb `XVb Zg/h°c`] ZVkañĩdj gñiZY`VgZh!i] Z°6>Vàdgt] b `YZiZgb `cZh`Xgdl Y`h`bZh¹ †] dj i!°c`i] Z°ciZgZhi`d[egliZXi`c\°cY`k`Yj Vah°egkVXr!`gZiV`c`c\`i] Z°[ddiV\Z#

L] `Xj `Xj d`XZ`Xdb eāZiZh`i] Z`iZnĩ`hd`i] Vi`†`Xdc[dgb hĩd`i] Z`XdckZci`dch`d[°HiVcYVgY': c\ah] 4

6#hnhizb VcVano`c\

7#hnhizb !VcVano`c\

8#hnhizb #6cVano`c\

9#hnhizb VcVano`c\

9°D * VZ) % °6chl Zg

8dggZXi°6chl Zg'8

GVi`dcVāZ

8] d`XZ°8°h`i] Z`VZhi`Vchl Zg#] Z`XdckZci`dc`VZ`c\`iZhiZY`h`ej cXij Vi`dc`j hZ`VZil ZZc`hZciZcXZh#>c`i] `h`Xj d`XZ!i] Z°eZgdY`h j hZY`XdggZXianĩd`b Vg`i] Z`Vdij cYVgn`VZil ZZc`dcZ`hZciZcXZ`Łi] Z`X†n hnhizb ,†VcY`Vcdi] ZgŁ6cVano`c\ [ddiV\Z,†#] Z eVg`X`e`Vāe] g/hZ`VZ\`cc`c\`¹ †] °VcVano`c\,`b dY^ Zh`i] Z`hj VZXi`d[i] Z`hZXdcY`hZciZcXZ!°,i] Z°6>Vàdgt] b #

8] d`XZ°6°h°c`XdggZXi#Ea/X`c\`V`YVh] `VZ[dgZ°,VcVano`c\,`XgZViZh`V`Xdc[j h`c\`VcY`Vb Waj dj h`b dY†n`c\`Zāb Zci ŁVcVano`c\###/gZh,†VcY`V`Xdb b V`heaXZ`VZil ZZc°,VgZVh,`VcY°,i] Z°6>Vàdgt] b #Ł6`Xdb b V`XVci`VZ`j hZY°c`i] `h¹ Vnĩd`b Vg i] Z`Vdij cYVgn`VZil ZZc`hZciZcXZh#8] d`XZ°7°h°c`XdggZXi`VZXVj hZ°†`gZhj āh°c`V`Xdb b V`heaXZ#6`Xdb b V`XVci`VZ`j hZY°c`i] `h I Vnĩd`b Vg`i] Z`Vdij cYVgn`VZil ZZc`hZciZcXZh#8] d`XZ°9°h°c`XdggZXi`VZXVj hZ°†`gZhj āh°c`V`g`c'dc`hZciZcXZ#1] Z`hZciZcXZh Łi] Z`X†n hnhizb ,VcY°,VcVano`c\ [ddiV\Z,†VgZ`[j hZY¹ †] dj i`ej cXij Vi`dc`VcY\$dgV`Xdc,j cXi`dc#

Fj Zhi`dc°9^ Xj an/ = VgY

Fj Zhi ʔc°9Z. VZZ%ʔ-

6hhZhhb Zci	I Zhi	9db Vʔc	Hʔ ʔaa	9^ Xj ʔn
H6l	GZWʔc\ ʔcYʔL gʔʔc\	HiVcYVgʔʔ: c\ʔhʔ 8dckZci ʔdch	7dj cYVgZh	

9/Z. VZZ%ʔ-

3.18

DcʔCdkZb WZgʔ !ʔ& , ' !ʔb ʔʔghʔc\ iZchʔdchʔ ʔʔ ʔ<gʔVi ʔ7gʔVʔc!ʔ7dhidcʔXdʔcʔhihʔ[dgʔ ZYʔi] Zʔ7dhidcʔ8db b ʔiZZʔd[
8dgʔZhedcYZcXZ#7nʔ& ,) !ʔ] Viʔ] VYʔhiVgZYʔVhʔVʔdXVʔb ZVchʔd[ʔb dWʔbʔc\ ʔj eedgʔ[dgi] ZʔEVigʔdi XʔVj hZʔ] VYʔ\gdʔ cʔʔcid
hdb Zi] ʔc\ [Vgʔb dgʔ TTTTTʔcZiʔ dgʔ d[ʔhʔ X] ʔXdb b ʔiZZhʔiʔ Vi!ʔ[VXʔʔVi ʔc\ ʔXdb b j cʔXVi ʔcʔVb dcʔiʔ] ZʔXdʔcʔZh!ʔ] ZʔæZYʔʔnʔiʔ] Z
ʔgdj cYʔ dgʔ [dgi] Zʔ8dci ʔcʔciVa8dcʔ\gʔhh#ʔ

L] ʔXʔ] Xʔ dʔXZʔXdb eʔZiZhʔiʔ] ZiZniʔhdʔiʔ ViʔʔʔXdc[dgʔ hʔidʔiʔ] ZʔXdckZci ʔdchʔd[ʔHiVcYVgʔʔ: c\ʔhʔ] 4

6#ZniZchʔkZ/Vʔt

7#ZniZchʔkZOV

8#ZniZchʔkZ!ʔʔʔ VhʔVʔt

9#ZniZchʔkZ#6t

9/Z. VZZ%ʔ- ʔ6chl Zg

8dgʔZXi ʔ6chl Zgʔ6

GVi ʔdcVʔZ

8] dʔXZʔ6ʔʔhʔiʔ] ZʔWʔhi ʔchl Zgʔʔ] ZʔXdckZci ʔdc Wʔc\ iZhiZYʔʔhʔiʔ] Zʔ hZʔd[ʔVʔXdʔcʔ ʔʔ ʔcʔVʔhZciZcXZ#ʔʔiʔ ʔʔXʔ] dʔXZ!ʔiʔ] ZʔXdʔcʔʔh
XdggʔXiʔnʔj hZYʔidʔʔcigʔYj XZʔiʔ] Zʔ[dʔdʔ ʔc\ ZneʔʔcVi ʔdcʔd[ʔʔ] Viʔiʔ] ZʔEVigʔdi XʔVj hZʔ] VYʔ\gdʔ cʔʔcidʔWʔʔ& ,) #

8] dʔXZʔ7ʔʔhʔcXdggʔZXi WʔXVj hZʔVʔhZb ʔXdʔcʔXVci Wʔʔj hZYʔʔcʔiʔ ʔʔʔ Vnʔidʔ_dʔcʔiʔ] Zʔb VʔcʔXʔʔj hZʔʔi] Vi ZniZchʔkZʔ ʔcYʔiʔ] Z
ʔj eeʔZb ZciVgnʔZʔZb ZciʔʔVʔcZiʔ dgʔ 8dcʔ\gʔhhʔ#6ʔhZb ʔXdʔcʔʔhʔXdckZci ʔdcVʔnʔj hZYʔidʔ_dʔcʔiʔ dʔb VʔcʔXʔʔj hZʔhʔ!ʔ] ZgʔVhʔV
XdʔcʔʔhʔXdckZci ʔdcVʔnʔj hZYʔidʔʔcigʔYj XZʔVcʔZʔZb Zciʔiʔ Vi ZneʔʔʔchʔdgʔVb eaʔ Zhʔiʔ] Zʔcʔ[dgʔ Vi ʔdcʔʔcʔiʔ] ZʔegʔXZYʔc\ ʔXʔʔj hZ!
b Vʔ ʔc\ iʔ] ZʔXdʔcʔiʔ] ZʔWʔiiZgʔXʔ] dʔXZʔʔcʔiʔ ʔʔhʔXdcʔiZniʔ#8] dʔXZʔ8ʔʔhʔcXdggʔZXi WʔXVj hZʔʔʔgʔhʔ ʔhʔcʔ VʔXdb b VʔheaXZʔʔ] ZʔVYʔʔʔdcʔd[
iʔ] Zʔegʔcdj cʔVcYʔkZgʔWʔʔʔ Vhʔ.[dgʔ hʔiʔ] ZʔhiVgʔ d[ʔVʔcZiʔ ʔb VʔcʔXʔʔj hZʔʔcʔiʔ] ZʔhZciZcXZ!ʔcYʔVʔXdb b VʔXVci Wʔʔj hZYʔʔcʔiʔ] ʔʔʔ Vn
idʔb Vgʔ iʔ] ZʔWʔj cYVgnʔWʔZiʔ ZZcʔiʔ dʔb VʔcʔXʔʔj hZʔhʔ#8] dʔXZʔ9ʔʔhʔcXdggʔZXi WʔXVj hZʔʔʔgʔhʔ ʔhʔcʔ Vʔgʔ ZidgʔXVʔnʔj cVXXZeiWʔZ
hZciZcXZʔ[dʔʔb Zci Wʔc\ ʔccʔc\ʔʔ ʔʔ] ʔVʔcZiʔ dgʔ #

Fj Zhi ʔc°9^ Xj ʔnʔ=Vgʔ

Fj Zhi ʔc°9°(V Y, , Y,

6hhZhhb Zci	I Zhi	9db Vʔ	Hʔ ʔaa	9^ Xj ʔan
H6l	GZWʔc\ ʔcYʔL gʔʔc\	HiVcYVgʔʔ: c\ʔhʔ 8dckZci ʔdch	7dj cYVgZh	

9°(V Y, , Y,

3.19

ʔcʔi] Zʔ& *%hʔcdkZaVj YʔʔiZX] cda\ ʔhVadl ZYʔi] ZʔVYYʔʔcʔd[ʔcdi] Zgʔchig b ZciʔidʔVooʔcYʔhi ʔc\TTTTʔgʔʔi kZanʔj ʔi
ʔchig b Zciʔʔhʔʔi ʔigʔc\Zʔd[ʔdj cYʔ Vhʔ cVanʔj YʔVʔVad\hYZʔi] ZʔVgʔc\ ʔgVhhʔchig b Zcihʔd[ʔi] Zʔʔb ZiʔVadl ʔc\ʔ Vj iʔhih
ʔʔZʔZccʔʔB Vj eʔcʔcYʔ7dWʔʔ=j b eʔ gʔnʔidʔeZgʔdʔ ʔʔ ʔʔdi] ZgʔVoo\gʔVih#

L] ʔʔ ʔʔ dʔXʔXdb eʔZiZhʔi] ZʔiZnʔʔhdʔi] ViʔʔʔXdc[dʔʔ hʔʔdʔi] ZʔXdckZci ʔdchʔd[ʔHiVcYVgʔʔ: c\ʔhʔ] 4

6#b j hʔʔiʔi] Zʔʔ j iZʔV

7#b j hʔʔ#ʔ] Zʔʔ j iZʔV

8#b j hʔʔQ] Zʔʔ j iZʔV

9#b j hʔʔʔi] Zʔʔ j iZ#6

9°(V Y, , Y, ʔchl Zg

8dggʔXi ʔchl Zgʔ9

GVi ʔcVʔZ

8] dʔXʔ9ʔʔhʔi] ZʔVZhi ʔchl Zgʔʔ] ZʔXdckZci ʔcʔVʔc\ʔiZhiZYʔʔhʔi] Zʔj hZʔd[ʔej cXij Vi ʔcʔʔ ʔʔ ʔcʔcYʔVZil ZZcʔhZciZcXZh#ʔcʔi] ʔh
X] dʔXʔʔi] ZʔXdaʔcʔXdggʔXiʔʔcigʔʔj XZhʔi] ZʔcVb Zʔd[ʔi] Zʔchig b Zciʔʔi] Zʔʔ j iZʔʔi] ViʔcdkZaVj YʔʔiZX] cda\ ʔhVadl ZYʔidʔVZ
VYYZYʔidʔVooʔcYʔhi ʔc\#ʔcʔVYYʔʔcʔʔi] ZʔeZgʔdYʔʔhʔj hZYʔidʔXdggʔXiʔʔb Vgʔʔi] ZʔVdʔj cYVgnʔVZil ZZcʔdcZʔhZciZcXZʔʔʔcʔ j iZʔʔ
VcYʔVcdi] Zgʔʔ6ʔgʔʔi kZan \gʔVihʔ#

8] dʔXʔ6ʔʔhʔcʔXdggʔXi ʔVZXVj hZʔʔʔgʔʔj ʔhʔcʔVʔXdb b VʔheaXZ#6ʔXdb b VʔXVci ʔVZʔj hZYʔcʔʔi] ʔhʔ Vnʔidʔdʔcʔʔil dʔb VʔcʔXʔʔj hZhʔʔcʔ
ʔj ʔiʔchig b ZciʔVcYʔʔh \gʔVihʔ#8] dʔXʔ7ʔʔhʔcʔXdggʔXi#ʔcʔhiVcYVgʔʔ: c\ʔhʔ] ʔʔʔhʔj cXdckZci ʔcʔVʔidʔ[dʔʔ ʔʔhZciZcXZʔcʔʔi] ʔh
ʔ Vnʔʔ ʔʔʔil dʔʔj cXddgʔʔcʔViZYʔʔhʔj ʔVZXihʔʔi] Zʔʔ j iZʔVcYʔʔhʔʔi] ʔigʔc\Zʔd[ʔdj cYʔʔʔVcYʔi] ZʔʔʔXʔʔd[ʔVʔXʔVgʔb Vʔcʔʔhʔj ʔVZXiʔgʔʔj ʔhʔcʔ
VcʔVi ʔʔʔ VgʔʔʔʔXdcʔig XiZYʔVcYʔXdcʔj hʔc\ʔhZciZcXZ#8] dʔXʔ8ʔʔhʔcʔXdggʔXi#ʔcʔhiVcYVgʔʔ: c\ʔhʔ] ʔʔʔhʔj cXdckZci ʔcʔVʔidʔ[dʔʔ ʔcʔ
ʔcʔZeZcYZciʔXʔʔj hZʔcʔʔi] ʔhʔ Vnʔʔ ʔʔʔil dʔʔj cXddgʔʔcʔViZYʔʔhʔj ʔVZXihʔʔi] Zʔʔ j iZʔVcYʔʔhʔʔi] ʔigʔc\Zʔd[ʔdj cYʔʔʔVcYʔi] ZʔʔʔXʔʔd[ʔV
XʔVgʔb Vʔcʔʔhʔj ʔVZXiʔgʔʔj ʔhʔcʔVcʔVi ʔʔʔ VgʔʔʔʔXdcʔig XiZYʔVcYʔXdcʔj hʔc\ʔXʔʔj hZ#

Fj Zhi ʔc°9^ Xj ʔan/=Vgʔ

Fj Zhi $\text{dc}^{\circ}9^{\circ}$. X(+(%W

6hhZhnb Zci	I Zhi	9db V'c	H' 'aa	9^ Xj an
H6l	GZW'c\ VcY'L g'f'c\	HiVcYVgY': c\ah] 8dckZci 'tlch	7dj cYVgZh	

9. $X(1) = 1$

3.20

J hC^c^ViJ g^aYZWgh!hJ X] VhYgZYTTTTT^hJ X] Vh^e^a^h^i^X^W^h^O^c^Y^b^d^g^i^g^Y^t^d^c^V^a^V^g^hJ eeaZh!hJ X] Vh^i^g^Z^`^a^Z^!^<^] VcV^Vc^Vg^hi^: Y^; g/c^ ac^<VkJ V^Xg^Z^ViZh] ^h^ig^ ^c^\\N^xxxx V^V^x^6[g^X^V^c^b^Vh^h!^]] ^X]] Z^] deZh^X^V^c^] Zæ^k^Zl Zgh^g^Zi] ^c^`^] dl^`^l^ VhiZ^h^j hZY^c^i] Z^g^Xdb b j c^f^Zh#

L] X] X] dXZ`Xdb eaZiZh'i] ZiZm'hdi] Vi`↑Xdc[dgb h'i'd'i] Z`XdckZci`dch`d[`HiVcYVgY': c\ah] 4

6#zVkJh!°b Vc"b WYZ°igVh] /

7#zVkhCb Vc"b VYZ'igVh]!

8#aZVkJh!°b Vc"b WYZ°igWh]!

9#zVkJhCb Vc"b VYZ'ig/h] 0

9/1. X(+(%N'6chl Zg

8dggZXi °6chl Zg/7

GV i ^dcVaZ

8] d'XZ'7'h'i] Z'VZhi'Vchl' Zg#] Z'XdckZci'dc'VZ'e'i'ZhiZY'h'i] Z'ej' cXij' Vi'dc'd[Z'aZb' Zcih'e'V'Xdb' e'aZmhZgZh#;h
XdckZci'dc'Va'id'j' hZ'V'hZb' Xdad'c'id'hZeVg/iZ'fZb' h'e'V'Xdb' e'aZmhZgZh'i' f] 'ciZg'Vaej' cXij' Vi'dc!'VcY'e'i] 'h'X] d'XZ'i] Z
hZb' Xdad'c'V[iZg' aVkZh' h'XdckZci'dc'Van'j' hZY'id'hZeVg/iZ'i] Z' ghi'fZb' f'cVij' g'aYZVgh'h'j' X] 'Vh'YgZY'aVkZh'i' VcY'i] Z
hZXdcY'fZb' f'c'V' Vc'b' VYZ'ig/h]'h'j' X] 'Vh'e'a'hi'X'VW'h'i'f'c'i] Z'hZgZh'd['b' ViZgV'h'j' hZY'Vh'<Vkj' V#; j' g] Zg'i] Z'Xdb' b' VV[iZg'
'ig/h]' XdgZ'Xian'hZeVg/iZ'h'i] Z'cdj' c'e] g'hZ' b' Vc'b' VYZ'ig/h]' .[g' b' i] Z'h'j' eeZb' ZciVg'ne] g'hZ' f'c'j' X] 'Vh'e'a'hi'X'VW'h'i'f'c'i] Vi
YZhXgVZh'f#

8] d'XZ'6'h'cXdgZXi WZXVj hZVXdb b VV[iZg, aVkJh, YdZhci b ViX] i] Z'hZb Xdadcj hZY a/iZgid hZeVg/iZi] Z'hZXdcY VcY
i] g'fZb h'c i] Z'hZgZhLb Vc"b VYZ###W\h, VcY, VcY### a Z, i#6YYf'dcVan'f'h'cdi XdckZci 'dcVaid'j hZV'Xdad'c'c i] h' Vn'id
hZeVg/iZV'hj eeZb ZciVgn'e] g/hZL'hj X] V'h'e a/h'X'W\h, i] [gdb i] Z'cdj c'e] g/hZ'f'b dY^ ZhLb Vc"b VYZi g/h] i#8] d'XZ'8'h
cXdgZXi WZXVj hZVXdb b VV[iZg, aVkJh, YdZhci b ViX] i] Z'hZb Xdadcj hZY a/iZgid hZeVg/iZi] Z'hZXdcY VcYi] g'fZb h'c
i] Z'hZgZhLb Vc"b VYZ###W\h, VcY, VcY### a Z, i#8] d'XZ'9'h'cXdgZXi WZXVj hZ'f'h'cdi XdckZci 'dcVaid'j hZV'hZb Xdad'c'c i] h
I Vn'id hZeVg/iZV'hj eeZb ZciVgn'e] g/hZL'hj X] V'h'e a/h'X'W\h, i] [gdb i] Z'cdj c'e] g/hZ'f'b dY^ ZhLb Vc"b VYZi g/h] i#

Fj Zhi ^dc°9^ Xj an/=VgY