

HUhhcc!?i bgh'[`cVU`'Yf`YVYb.'=b_`UVg Vf]b[h']bhYfbUh]cbU`Y'?Øbgh`Yf'bUW\ 8fYgXYb

9bhXYW_Yb^G]Y^X]Y^]bbcj Uh]j Y^HUhhcc!K Y^hj cb~⊕_`UVgžk c
]bhYfbUh]cbU`Y^; Ugh_Øbgh`Yf^Y]bn][Ufh][Y^8Yg][bg'i bX
HYWXb]_Yb^bUWX^8Yi hgWX^UbX^Vf]b[Yb"@UggYb^G]Y^g]WX^j cb
ØVYf^' \$\$^hU`Ybh]YfhYb^HÀhck]YfYfb^VYfUhYb^i bX^Z]bXYb^G]Y
XYb^dYfZY_hYb^Gh]^^ZØf^⇒\f^]bX]j]Xi Y^`Yg^HUhhcc"'<cWk Yfh][Yf
GYfj]WY^i bX^a cXYfbY^Ghi X]cg^]b^6Yf^]bž^8fYgXYbž^BØfbVYf[
i bX'<U``Y^Yfk UfhYb^G]Y"^J YfY]bVUfYb^G]Y^Yhnh'⇒\f
i bj YfV]bX^]WXYa^6YfUhi b[a[YqdfÀWX^



8]Y 'HUhhcc! K Y `h' $nc[Yb'a]h'] \land fYb'=fYUh]jYb$ 8 Yg][bY `Ya YbhYb 'ZUgn]b]YfYbX ° '8 Ug '8 fYgXbYf' HUhhccghi X]c $=b_`UVg']gh'b]W h'bi f'Y]b'Cfhz'gcbXYfb'Y]b'di `g]YfYbXYg'NYbhfi a$ $ZØf'? Øbgh`Yf'Ui g'U``Yf'K Y `hz'X]Y'\]Yf']\ fY'Y]bn][Ufh][Yb'HU`YbhY$ YbhZU`hYb'''K Ybb'G]Y'Ui Z'XYf'Gi WY'bUWX'Y]bYa 'HUhhcc'g]bXz'XUg $<math>= fY']bX]j \]Xi \ Y``Y''; \ YgWX \]WX hY'YfnÀ\`hz']gh'=b_`UVg'XYf'f]WX h][Y'D`Uhn$ 8 Ug::]bXYb'XYg'dYfZY_hYb'HUhhccg']gh'k]Y'X]Y'Gi W\Y'bUW\'XYa dUggYbXYb'Di nn`YghØW_"'\XYYg'A ch]j 'a i gg'[i h'Xi fW\XUW\h'gY]bž UVYf'XYf'GW\`ØggY``ni 'Y]bYa '[Y'i b[YbYb'?i bghk Yf_'`]Y[h'Ui W\']b XYa '?Øbgh`Yfž'XYf'Yg'YfgW\UZZh"'; YbUi '\]Yf'_ca a h'\b_`\UVg']bg Gd]Y``'A]h'Y]bYf'VYY]bXfi W_YbXYb'5i gk U\`'j cb'ØVYf'' \$\$
]bhYfbUh]cbU`Yb'HUhhcc!?Øbgh`Yfb'Vf]b[h'XUg'Ghi X]c'Zf]gW\Yb'K]bX
]b'X]Y'GnYbY'i bX'Yfa Ò[`]W\h'Yg'YXYa '?i bXYbž'gY]bYb']XYU`Yb

K Ufi a]bhYfbUh]cbU`Y; Ugh_Øbgh`Yf3

9gʻ]ghʻXYfʻ]bhYfbUh]cbUʻYʻ: `U]fžʻXYbʻ\b_`UVgʻ]bʻX]YʻXYi hgWXYʻHUhhcc!
GnYbYʻVf]b[hʻʻ K]fʻʻUXYbʻ[YfbYʻ]bhYfbUh]cbUʻYʻ? ØbghʻYfʻY]bžʻi a
]\fYʻY]bn][Ufh][Ybʻ: À\][_Y]hYbʻ]bʻi bgYfYʻGhi X]cgʻni ʻVf]b[Ybʻi bX
gcʻ_i `hi fY``YʻJ]YʻZUʻh'ni ʻZÒfXYfb žʻj YffÀhʻXUgʻYb[U[]YfhYʻHYUa "
8Yfʻ9fZc`[`X]YgYfʻGhfUhY[]Yʻ]ghʻi bØVYfgY\VUfʻ8]YʻVYgcbXYfY
?ca V]bUh]cbʻUi gʻHU`Ybhʻi bXʻY]bn][Ufh][YbʻHYWXb]_YbʻXYf
; Ugh_Øbgh`YfʻcZZYbVUfhʻg]WXʻ]bʻYXYa ʻY]bnY`bYbʻHUhhcc"

8]Y'5i gk U\`XYf?@bgh`Yf']gh'_Y]b'Ni ZU``"K Yf'VY]'__`\UVg'UfVY]hYhž a i gg'Y]b'ghfYb[Yg'5i gk U\`j YfZU\fYb'Xi fW\`Ui ZYbž'XUg g]W\YfghY``hž'XUgg'bi f'X]Y'hU`Ybh]YfhYghYb'?fYUh]j Yb'Y]b[Y`UXYb k YfXYb"'| bhYf'XYb']bhYfbUh]cbU`'[YZY]YfhYb'; Ugh_@bgh`Yfb'g]bX Ui W\'BUa Yb'k]Y'5bhcb]g'Ui g'; f]YW\Yb`UbX'i bX'HUfUg'G\hUb_c Ui g'XYf'| _fU]bYž'X]Y'a]h']\fYb'Y]bn][Ufh][Yb'HYW\b]_Yb'X]Y ?i bXYb']b'GhUi bYb'j YfgYhnYb"

9f`YVb]g'i bX'GYfj]WY'Ui Z'\ ÒW\ ghYa 'B]j YUi

#D_`UVg`V]YhYh'b]W\h'bi f`?i bghž'gcbXYfb`Ui W\`Y]b`9f`YVb]g``8]Y
j]Yf`Yfgh_`Ugg][Yb`Ghi X]cg`]b`6Yf`]bž'8fYgXYbž'BØfbVYf['i bX'<U``Y
g]bX`k U\fY`K c\`ZØ\`cfhY"'<]Yf`hfYZZYb`gh]`j c``Yg`8Yg][b`i bX
YbhgdUbbhY`5ha cgd\ÀfY`Ui ZY]bUbXYfž'k À\fYbX`XUg`[YgW\i `hY
DYfgcbU``ZØf`XUg`K c\``XYf`?i bXYb`gcf[h"`?cghYb`cgYg`K @5Bž
GbUW_g`i bX'; YhfÀb_Y`gcf[Yb`XUZØfž`XUgg`g]W\`X]Y`HUhhcc!
@]YV\UVYf`k]Y`ni '<Ui gY`ZØ\`Yb`</pre>

 $8]Y `DUfhbYf'j cb`* \\b_`UVg'dfcZ]h]YfYb'j cb`Y]bYf'dfcZYgg]cbY``Yb? ibXYbVYfUhi b[ž'X]Y `YXYb'GWXf]hh'ni 'Y]bYa 'dYfZY_hYb'HUhhccVY[`Y]hYh'''8Yf']bbcj Uh]j Y'9]bgUhn'j cb'a cXYfbghYf'HYWXbc`c[]Yžk]Y `XYf'Z]fa YbY][YbYb'?= <math>b_'5= z'ghY``h'g]WXYfz'XUgg'_Y]b$ K i bgWX'Ui Z'XYf'GhfYW_Y'V`Y]Vh''8]YgY'VU\bVfYWXYbXYHYWXbc`c[]Y'\]`Zh'XUVY]z']bX]j]Xi Y``Y'8Yg][bg'ni 'Ybhk]W_Y`bz'X]Y[Ubn'Ui Z'X]Y'K ØbgWXY'XYf'?i bXYb'ni [YgWXb]hhYb'g]bX' 'Y]bZUWX[Yb]U``

A]h'ØVYf'(\$"\$\$\$'ni Zf]YXYbYb'?i bXYb']b'XYb'`YhnhYb'UW\h'\J\fYb\\Uh'\=b_`UVg'X]Y'XYi hgW\Y'HUhhcc!GnYbY'fYj c`i h]cb]Yfh"'9]bY
6fØW_Y'nk]gW\Yb'j YfgW\]YXYbYb'HUhhcc!?i `hi fYb'i bX'Y]b'Ni [Ub[
ni 'Y]bn][Ufh][Yb'?i bghk Yf_Yb' 'U``XUg'V]YhYh'X]YgYg
Ui »Yf[Yk Ò\b`]W\Y'I bhYfbY\a Yb'gY]bYb'?`]YbhYb"

$$\begin{split} & K \ U[\ Yb \ G]Y \ XYb \ GWX \ f]hhii \ b X \ ``UggYb \ G]Y \ g]WX \ 'j \ c b \ XYb \\ & VYghYb \ ']bhYfb Uh]c b U `Yb \ ? \ \emptyset b gh`Yfb \ VY] \ =b _ `UVg \ [\ YghU`hYb \ `9bhXYW_Yb \ G]Y \ z'k \]Y \ Y]b ZUWX \ Yg \]ghz' = AfY \ HUhhc c! HfÀi a Y \\ & K \]f_`]WX_Y]h'k \ YfXYb \ 'ni \ ``UggYb'' \ J \ YfY]b V UfYb \ 'G]Y \ AfY \ hnh' = Af \\ & i \ bj \ YfV]b X`]WX \ Yg \ GYfUhi \ b [\ g[\ YgdfAWX \ 'i \ b X \ 'ghUfhYb \ 'G]Y \ = Af \\ & d \ YfgOb`]WX \ Yg \ ?i \ bghdfc \ Y_h^\circ \end{aligned}$$

6 Ygi WX Yb 'G]Y 'i bg 'Ui Z. 'a Y]b!VYf`]b "bYh