

8]Y'Hcd'%\$': Ua]`]YbUi gZ`i [gn]Y`Y']b 8Yi hgW\`UbX.'GdU» 'ZØf'; fc»'i bX'? `Y]b°

9bhXYW_Yb^G]Y^ZUa]`]YbZfYibX`]W\Y^5igZi[gn]Y`Y^]b 8YihgW\`UbX^a]h^XYb^?]Y`Yf^BUW\f]W\hYb^^H]ddg^ZØf YbhgdUbbhY^?ifnif`UiVY^



; Of`]hnž'8 Yi hgW `Ub X '!': Øf': Ua]`]Ybž'X]Y'bUW 'gdUbbYbXYb
5i gZi [gn]Y`Yb']b'8 Yi hgW `Ub X 'gi W Ybž'[]Vh'Yg'nU\`fY]W Y
C dh]cbYbž'X]Y'gck c\`'5 VYbhYi Yf'ZØf'?]bXYf'U`g'Ui W
9bhgdUbbi b['ZØf'9fk UW gYbY'V]YhYb"'9]b'U_hi Y``Yf'5fh]_Y`'j cb'_b!
cb`]bY"XY'ghY``h'nY\b'Ya dZY\`Ybgk YfhY'FY]gYn]Y`Y'ZØf'Y]bYb
?i fni f`Ui V'j cf"

5b YfghYf'GhY``Y'ghY\h'; **Òf`]hn**']b'GUW\gYbž'X]Y'Ògh`]W\ghY'GhUXh 8 Yi hgW\`UbXg"'; Òf`]hn'VY[Y]ghYfh': Ua]`]Yb'a]h'XYa 'H]YfdUf_ž'XYf ØVYf') \$\$ 'H]YfY'VY\YfVYf[h'i bX'U`g'XUg'VY`]YVhYghY'5i gZi [gn]Y`]b'GUW\gYb'[]`h"'BYVYb'h]Yf]gW\Yb'9f`YVb]ggYb'_ÒbbYb'6Ygi W\Yf X]Y'?i `hi f]bgY``9]bg]YXY``VYgi W\Ybž'Y]b': fY]`i Zha i gYi a 'a]h ?`YhhYfa Ò[`]W_Y]hYb'i bX'Y]bYa '6Ui a \Ui g\chY'ž'XUg'a Y\f'U`g

&\$\$; VYfbUW\hi b[gd`\hnY`UbV]YhYh"`6Ygi W\Yf`_\ObbYb`Ui W\`X]Y; \Of`]hnYf`5`hghUXh`Yf_i bXYb\z'X]Y`GY\Ybgk\\ØfX][_Y]hYb`k]Y`X]Y\DYhYfg_]fW\Y`i bX`XUg`; \Of`]hnYf`FUh\Ui g`i a \ZUggh\z'gck]Y`Ub\GhUXhfi bX\ZU\fhYb`i bX`GW\b]hnY`\U[XYb`hY]`bY\a Yb\z'k]Y`\fY]qY`UbX]U"XY`Ui q\z\O\f`]W\`VYqW\fY]Vh"

K Y]hYfY ZUa]`]YbZfYi bX`]WXY 8 Ygh]bUh]cbYb

; fY]Zgk U`X`]b`A YW_`YbVi f[!J cfdca a Yfb`V]YhYh`a]h`gY]bYa H]YfdUf_`i bX`XYa `BUhi fYf`YVb]gdUf_`; f]ghfck `nU\`fY]W\Y A $O[`]WX_Y]hYb`ZØf`Ci hXccf!5_h]j]hAhYb"`8]Y`GhUXh`]gh`]XYU``ZØf : Ua]`]YbZ`X]Y`Y]b`ZUa]`]YbZfYi bX`]W\Yg`< chY``Ua `; fY]Zgk U`XYf 6cXXYb`gi W\Yb"$

 $= a \cdot b \cdot cfXf \cdot Y]b!k \cdot YghZA^{}[gWX Yb'8 \otimes fYb'][JVhYg'XYb \\ < cWXgY]^{}[UfhYb'< \otimes fh[Ybk U^X'Z\ightaff'5XfYbU^{}]b'1 b_]Yg'i bX'XUg \\ : fY]^{}[WX ha i gYi a '?ca a Yfbž'XUg' \ UbXk Yf_^{}[WXY'5fVY]hYb'nY][h'' : Ua]^{}YbZfYi bX^{}[WXY']bhYf_\ightaffybZhY'Z]bXYh'a Ub']a '< chY^FchYg \\ 9]b \ cfbž'XUg'Ui WX'Y]bYb'Gd]Y^d`Uhn'i bX'Y]bYb'?^Y]bh]Yfncc'V]YhYh''$

 $: \emptyset f'5VYbhYi Yf'i gh][Y'V]YhYh'6UX'@Ub[YbgU`nU']b'H\\emptyset f]b[YbX]Y'?]bXYfYf`YVb]gk Y`h'FiadY`Vif['ibX'XYbK]'X_UhnYb_]bXYfk U`X'a]h'j]Y`gY]h][Yb'Gd]Y`a <math>O[`]WX_Y]hYb''$ NU\`fY]WXY', VYfbUW\hib[gcdh]cbYbž'Y]bgW\`]Y`"]W\']Xm``]gW\Yf: Yf]Ybk c\bib[Ybž'q]bX'YVYbZU``q'jYfZ \emptyset [VUf''

5_h]j]hÀhYb]b UbXYfYb FY[]cbYb

8 UgʻGUUf`UbXʻ]ghʻa]hʻ@cg\Y]a ʻUa ʻGYYʻY]bʻk Y]hYfYg Ya dZY\`Ybgk YfhYgʻN]Y`"'<]Yfʻ_ÒbbYbʻ: Ua]`]Yb 5`dU_Uk UbXYfi b[Ybʻ[Yb]Y»YbʻcXYfʻY]bYʻGW\]ZZZU\fh'Xi fWXʻX]Y $: \emptyset f'BUhi f`]YV\setminus UVYf']gh'XUg'C ghU`V_fY]g']b'6UXYb! \\ K \emptyset fhhYa VYf['Y]b'YW\hYf'; Y\Y]a h]dd'''<]Yf'k UfhYb'h]Yf]gW\Y 6Y[Y[bib[Yb']a '9i 'YbYf`YVb]g'?fUi g'i bX'XYf \\ K U`XYbhXYW_YfdZUX' GW\]bXYfg_`]b[Y 'Ui Z'?]bXYf''8Ug 6Ui a \Ui g\chY``FcgYbVYf['V]YhYhY]bY'VYgcbXYfY , VYfbUW\hi b[gYfZU\fi b["$

5i W. ']b';]Y» Ybž' < YggYbž'_ÒbbYb': Ua]`]Yb']a 'A Uh\Ya Uh]_i a X]Y': Ugn]bUh]cb'XYf'A Uh\Ya Uh]_'Yf`YVYb"'8]Y'GhUXh'\Uh'gck c\`Y]b': fY]VUX'U`g'Ui W. 'XUg']Xm``]gW. '[Y`Y[YbY'GW.`cgg\chY`6fUi bZY`g'ni 'V]YhYb"'

: Øf'FY]gY`i gh][Y']a 'GØXYb'`cW_h': ØggYb']b'6UmYfb'a]h'XYa VYfØ\a hYb'GW\`cgg'BYi gW\k UbghY]b'gck]Y'5_h]j]hÀhYb'k]Y'?Ubi! HcifYb'i bX'Y]bYf'Gca a YffcXY`VU\b"

 $5V[YfibXYhrk]fX:X]Y:@]ghY:XifWX:6Yf`]bža]h:]bhYfU_h]jYb 9f`YVb]ggYb:]a:Gd]cbU[YaigYia:ibX:7cadihYfgd]Y`YaigYia:"8Yf'< \emptysethhYbdU`Ugh:V]YhYh:Y]bn][Ufh][Y,VYfbUWXhib[gaÒ[`]WX_Y]hYbž:X]Y:]a:Y\YaU`][Yb::UVf]_[YVÀiXYibhYf[YVfUWXhig]bX"$

Ni gUa a YbZUggYbX`V]YhYh`8 Yi hgW\`UbX`Y]bY`: \emptyset ``Y`j cb ZUa]`]YbZfYi bX`]W\Yb`5i gZi [gn]Y`Ybž'X]Y`Z \emptyset f'`YXYb`; YgW\a U_Yhk Ug`VYfY]h\U`hYb\"`K]Y`a Y]b[Ybi gg\"XY`ZYghghY``hž'gc``hYb : Ua]`]Yb`VY]`XYf`D`Ubi b[`]\fYf`FY]gY`X]Y`\DhYfYggYb`i bX`XUg`5`hYf]\fYf`?]bXYf`VYf \emptyset W_g]\W\h][Ybž'i a `i bj Yf[Ygg`]\W\Y`9f`YVb]ggY`ni g\W\UZZYb\"

| 8 Y hU]`g | |
|-----------|---------------------------|
| Cfh | ; Òf`]hnž'8 Yi hgW\`Ub X |
| EiY``Yb | • k k k "_b!cb`]bY"XY |
| | • fY]gY`UbX]U"XY |
| | • k k k "a Y]b[Ybi gg"XY |

6 Ygi WX Yb 'G]Y 'i bg 'Ui Z. 'b!U["bYh