

$8Y^Ub^TUXcb^TWV^Y]Vh^TVY]^5i ghf]U^K]Yb. J YfhfU[^V]g^&$&+^j Yf^Ab[Yfh^c$

8 Y 'Ub 'F UXcb ']Wj Yf`Àb[Yfh'gY]bYb 'J YfhfU['VY]a ':?'5i ghf]U K]Yb 'V]g'&\$&+'i bX'_Y\fh'bUW\'nk Y]'\\J\fYb'j cb'GJ'Ghf]dZ]b[ni fØW"



K]Yb!: Uj cf]hYbž'² ghYffY]WX '! '8 Yf': ? '5i ghf]U'K]Yb'\Uh'Y]bYb

VYXYi hYbXYb'GWXf]hh']b'gY]bYf'? UXYfd`Ubi b['[Ya UWXh.

♣bYbj YfhY]X][Yf'8 Y'Ub'F UXcb']WV`Y]Vh'XYa 'HfUX]h]cbgj YfY]b'hfYi
i bX'\Uh'gY]bYb'J YfhfU['i a 'nk Y]'∜J\fY'V]g'Gca a Yf'&\$&+
j Yf'Àb[Yfh"'8]Y'cZZ]n]Y``Y'6Y_Ubbh[UVY'YfZc`[hY'Ua': fY]hU[UVYbXž
i bX'XUa]h']gh'XYf'%-!'À\f][Y'Gd]Y`Yf'ni fØW_']b'XYf
?Ua dZa UbbgWXUZh'XYg'J YfY]bgž'k c'Yf'gY]bY'?Uff]YfY'j cf'j]Y`Yb

∜J\fYb'VY[Ubb"

 $FUXcb^{\prime}W_Ua^{\prime}U^{\prime}g^{\prime}5W_h^{\prime}h^{\prime}h^{\prime}h^{\prime}f][Yf^{\prime}nif^{\prime}5ighf]U^{\prime}ibX^{\prime}h^{\prime}g^{\prime}]hXYa$ ni a 'hU`Ybh]YfhYb^5Vk Y\fgd]Y^Yf^Ybhk]W_Y^h"' \pm b^XYb^^YhnhYb^VY]XYb Gd]Y^nY]hYb^k Uf^Yf^VY]a 'GJ^Ghf]dZ]b[']b^XYf^58A \pm 5@^&"'@][U i bhYf^JYfhfU[ž'k c^Yf^]bg[YgUa h') %'DZ]W_hgd]Y^Y^UVgc^j]YfhY"' \pm b

gY]bYb'NY]h']b'Ghf]dZ]b['_cbbhY'Yf'g]W\'U`g'GhØhnY'YhUV`]YfYb'i bX $dUW_hY'Y]b$][Y'k Yfhj c``Y'9fZU\fi b[Yb'Ubž'X]Y'Yf'bi b'k]YXYf']b K]Yb!: Uj cf]hYb'Y]bVf]b[Yb'_Ubb'''6YgcbXYfg']b'9f]bbYfi b[[YV`]YVYb']gh'gY]b'YbhgW\Y]XYbXYf'HfYZZYf']a '2: 6!7i d! 5W\hY`Z]bU`Y'[Y[Yb'XYb'G?'FUd]Xž'XYf'ni f'&.%!: \emptyset \fi b['Z \emptyset \fhY''

$GhUf_YFØW_Y\$

5a '&' "'> b] 'ghUfhYh'F UXcb']Wa]h'XYf'? Ua dZa UbbgW\UZh']b'X]Y
J cfVYfY]hi b['Ui Z'X]Y'_ca a YbXY'GU]gcb"'GdcfhX]fY_hcf'A Ubi Y`
C fh`YW\bYf'\YVh'\Yfj cfž'XUgg'F UXcb']Wb]W\h'bi f'ØVYf'FcVi gh\Y]h
i bX'Nk Y]_Ua dZghÀf_Y'j YfZØ[hž'gcbXYfb'Ui W\'nU\`fY]W\Y'9]bgÀhnY
]b'XYf'GhUfhY`Z'XYf'&"'@][U'j cfk Y]gYb'_Ubb"'8]YgY'5hhf]Vi hY'g]bX
ZØf'X]Y'Dcg]h]cb'XYg'=bbYbj YfhY]X][Yfg'j cb'nYbhfU`Yf'6YXYi hi b[
i bX``UgqYb'Ui Z'Y]bY'j]Y`j YfgdfYW\YbXY'Ni _i bZh`\cZZYb"

8 Yf::? '5i ghf]U'K]Yb'\Uh'a]h'F UXcb']WY]bYb'j]Y'j YfgdfYWXYbXYbGd]Y'Yf'Ub'6cfX'[Y\c'hž'XYf'b]WXh'bi f']b'XYf'8 YZYbg]j Y'ZØfGhUV]']hÀh'gcf[Yb'gc'`ž'gcbXYfb'Ui WX'X]Y'B UWXk i WXgUfVY]h'XYg JYfY]bg'k Y]hYf'ghÀf_h"'9g'V'Y]Vh'UVni k UfhYbž'k]Y'g]WX'X]Y''A b[Y A UbbgWXUZh']a '_ca a YbXYb'A Y]ghYfgWXUZhgnm_`i g'VY\Ui dhYbk]fX"'8]Y': Ubg'_ÒbbYb'g]WX''YXYbZU``g'Ui Z'Y]bY'gdUbbYbXY JcfVYfY]hi b['ZfYi Ybž']b'XYf'FUXcb']Wi bX'gY]bY'?c``Y[Yb'nY][YbkYfXYbž'k Ug']b']\bYb'ghYW_h"

Ni gUa a YbZUggYbX`ZfYi h`g]W\`XYf`7`i V`ØVYf`X]Y`JYf`Àb[Yfi b[`a]hFUXcb^]Wi bX`VYhfUW\hYh`X]YgY`9bhgW\Y]Xi b[`U`g`HY]``Y]bYfGhfUhY[]YžX]Y`j]Y`j YfgdfYW\YbXY`HU`YbhY`]a `Y][YbYb`JYfY]b

`Ub[Zf]gh]['ni '\U`hYb'i bX'[Yn]Y`h'Y]bni gYhnYb"'8Yf'GhUfh']b'X]Y
bYi Y'GU]gcb'Ua '&' "'\$\darkarrangle b]'_ObbhY'ZØf'XYb'hU`Ybh]YfhYb
\darkarrangle bYbj YfhY]X][Yf'i bX'X]Y'JYfY]b'Y]bY'gdUbbYbXY
<YfUi gZcfXYfi b['XUfghY``Yb"</pre>

: Øf'k Y]hYfY' ±bZcfa Uh]cbYb'ni 'XYb'9bhk]W_`i b[Yb']a ⇒ [YbXZi ggVU``ž'X]Y'Ui W\']a 'Ni gUa a Yb\Ub['a]h'UbXYfYb'7`i Vg ghY\Ybž'_ÒbbYb'G]Y'X]Y'8 UhYb'Ui Z'GhUh]ghU'Y]bgY\Ybž'k Ug'X]Y U``[Ya Y]bYb'HfYbXg']b'XYf'BUW\ki W\gZÒfXYfi b['VYhf]ZZh"

 $: \emptyset f `X] Y `b Y i Y g h Y b `B Y i] [_Y] h Y b `i b X `I d X U h Y g `n i `F U X c b '] W i b X `X Y a \\ : ? `5 i g h f] U `K] Y b ``Y g Y b `G] Y `a Y \ f `U i Z `@] [U d c f h U ``i b X `@U c `U %"$

8 YhU]`g	
Cfh	K]Yb!: Ujcf]hYbž ² ghYffY]WX
EiY``Yb	k k k "`][UdcfhU`"Uh
	• k k k "`Uc`U%"Uh
	XY"ghUh]ghU"Wca

6Ygi WXYb G]Y i bg Ui Z. a Y]b!k]Yb bYh