

Jc[Y`gWXYi WXYb']a 'K YhhVYk YfV.'; fc» FUX]gWX 'ZY]Yfh'?]fgWXYbZYgh'&\$&) °

5a '%+"'> b]'&\$&) 'Z]bXYh']b'; fc» 'FUX]gW\'XYf'hfUX]h]cbY``Y Jc[Y`gW\Yi W\Ybk YhhVYk YfV'ni a '?]fgW\YbZYgh'ghUhh"'GY]Yb G]Y'XUVY]°



; fc » F UX]gWX ž:8 Yi hgWX `Ub X !! *b ; fc » F UX]gWX ž'Y]bYa
a U`Yf]gWX Yb 8 cfZ]a @Ub X_fY]g'; Of`]hnž'k]fX Yg Ua __ca a Yb XYb
GUa ghU['k]YXYf Vi bhi bX `i gh]['ni [Y\Ybž'XYbb 'XYf 'hfUX]h]cbY``Y
J c[Y`gWX Yi WX Ybk YhhVYk YfV 'ghY\h'j cf 'XYf 'HØf" '8]Y
J cfVYfY]hi b[Yb 'XUZØf ``Ui ZYb 'VYfY]hg'Ui Z' < cWX hci fYb "
C f[Ub]gUhcf]bbYb 'GUV]bY ' < c\`ZY`Xž'; UV] 'GU[Yf'i bX 'I fgi `U
: f]hgWX Y `\ UVYb 'g]WX 'a]hij]Y``9`Ub 'Ub 'X]Y '5 fVY]hi[Ya UWX h" '8 Yf
K YhhVYk YfV 'Z]bXYh'\Yi Yf 'ni a '' \$"'A U``ghUhhi bX __Ubb 'Ui Z'Y]bY
`Ub[Y 'HfUX]h]cb 'ni f@W_V`]W_Ybž'X]Y '%- -) ']\fYb '5 bZUb['bU\a ž'U`g
\$\approx UWX]a 'i bX 'A Uf`]Yg'A]hgWX_Y 'XUg'9j Ybh']bg'@YVYb'f]YZYbž'YfnÀ\`h
XYf'A 8 F"

A]h']bg[YgUa h'bYi b'ØVYf`YVYbg[fc» Yb'i bX'_fYUh]j Yb

Jc[Y`gWXYi WXYb`k]fX`XYf`K YhhVYk YfV`Ui Z`XYa `: Yghd`Uhn YfÒZZbYhži bX`VYgcbXYfg`X]Y`5Vgh]a a i b[`XUfØVYfž'k Y`WXY`XYf?i bghk Yf_Y`X]Y`cf][]bY``ghY`]ghž'k]fX`X]Y`8cfZVYk c\bYf`i bX 6Ygi WXYf`VY[Y]ghYfb"` K]f`\UVYb`j cb`_`Ugg]gWXYb`<c`n_fYi nYb V]g`\]b`ni `ZUbhUg]Yj c```[YghU`hYhYb`:][i fYb`U``Yg`XUVY] ž'j YffÀh <c\`ZY`X"I a `XYb`HY]`bY\a Yfb`X]Y`K U\``ni `Yf`Y]WXhYfbž'ghY\Yb XUZØf`@cghÒdZY`VYfY]h"

?i`hifY``Y'< O\Ydib_hY'XYg'?]fgW\YbZYghg

 $5VYf'b]WXh'bi f'X]Y'Jc[Y`gWXYi WXYb'ghY\Yb']a :: c_i g' :XUg ?]fgWXYbZYghž'X]Y'VYXYi hYbXghY'JYfUbghU`hi b[:XYg'?i`hi f!'i bX < Y]a Uhj YfY]bgž'Z]bXYh'YVYbZU``g'Ua :K cWXYbYbXY'ghUhh''8 Ug': Ygh ZÀ``h'Ui Z'XYb'nk Y]hYb'<math>\Rightarrow$ `]k cWXYbYbXY'i bX'k]fX'gY]h'%, *%'[YZY]Yfh'' \Rightarrow `X]YgYa : \Rightarrow J\f'k]fX'X]Y'Jc[Y`gWXYi WXY'Ui g'Ghfc\VU``Ybž'X]Y'Ua 9]b[Ub['ni a :: Yghd`Uhn'Ui Z[YghY``h'k]fXž'gc[Uf']b'UWXh'Ghi bXYb < UbXUfVY]h'[YZYfh][h''8]YgYg'HY]``k]fX'X]Y'6Ygi WXYf'gWXcb'Yhnh Ui Z'X]Y': Y]Yf`]WX_Y]hYb'Y]bgh]a a Ybž'k]Y'X]Y'GÀWXg]gWXY'NY]hi b[VYf]WXhYh'

 $8 \ Ug'? \]fgWXYbZYgh'Vf]b[\ h'X]Y'8cfZ[\ Ya\ Y]bgWXUZh'ni\ gUa\ a\ Yb'''J\]Y'Y\\ 6 \ \emptyset f[\ Yf'Ui\ g';\ fc > 'F UX]gWX'i\ bX'XYf'BUWXVUf[\ Ya\ Y]bXY\\ < c \ YbXi \ VfUi\ `\ UVYb'g]WX'_fÀZh][\ ']bg'NYi [\ '[\ Y'Y[\ hž'i\ a\ 'XYb'5i\ ZVUi\ ni 'i bhYfghØhnYb'''6YgcbXYfg'X]Y'GYb]cfYb''Y]ghYb'k \ Yfhj c``Y'<]`ZYž k Ybb'Yg'XUfi a '[\ Y\hž'X]Y'6Ø\bY'ZØf'X]Y'nU\`fY]WXYb\\ 8 UfV]Yhi b[\ Yb'j cfni \ VYfY]hYb'''5i WX'@UbXk]fhY'i bX; Yk YfVYhfY]VYbXY'Ui g'XYf'FY[]cb'i bhYfghØhnYb'XUg': Ygh Z]bUbn]Y``'i bX'a UhYf]Y``''$

9]b : Ygh ZØf X]Y [UbnY : Ua]`]Y

± X]YgYa → J\f`XØfZYb g]W\ X]Y 6Ygi W\Yf`Ui Z'j]Y ZÀ`h][Y 5_h]cbYb ZfYi Yb"8]Y Cfhgk Y\f`k]fX k]YXYf`X]Y VY`]YVhYb; Ui X]!Gd]Y Y UbV]YhYbži bX Ua `GUa ghU[bUW\a]hhU[`ghY\h`Y]b : Ua]`]YbbUW\a]hhU[`Ui Z'XYa `Dfc[fUa a ž'XYf`[Ya Y]bgUa `a]h`XYf dc`b]gW\Yb `DUfhbYf[Ya Y]bXY `Gi `]_ck `cf[Ub]g]Yfh`k]fX" <]Yf nY][Yb i bhYf`UbXYfYa `X]Y `HUbn[fi ddY `K Y][YfgXcfZ'i bX `X]Y A chcfgdcfh[Ya Y]bgW\UZh`B]Yg_m`]\f`? ÒbbYb" '9]bY `VYgcbXYfY

, VYffUgWki b['g]bX'X]Y'K]bX`]WkhYf'Ui g'U`hYb'; `ÀgYfb'a]h ?]fgWka ch]j Ybž'X]Y'YVYbZU``g'HY]`'XYg'Dfc[fUa a g'k YfXYbž'gc'X]Y Òfh`]WkYb'Cf[Ub]gUhcfYb'j cb'CghgUWkgYb"

9]b'k Y]hYfYg'<][\`][\h']gh'XYf'5i Zhf]hh'XYf'?]fgWXYbZfUi ; UVf]Y`Y GU[Ufž'X]Y'Ua 'GcbbhU[bUW\a]hhU['a]h'XYa '9]bni ['XYf?]fgWXYbk U[Yb'ZØf'Gh]a a i b['gcf[Yb'k]fX"'I bX'bUhØf`]WX'XUfZ Ui WX'X]Y'UVYbX`]WXY'G\ck Y]b`U[Y'XYg'?UfbYj U`Wi Vg'B]Yg_m'b]WXh ZY\`Ybž'X]Y'X]Y'DUfhmgh]a a i b[']a ': YghnY`h'dYfZY_h'a UWXh" Fi bXi a 'k YfXYb'X]Y'6Ygi WXYf'a]h'U``Yf`Y]'_fYUh]j Yb'6Y]hfÀ[Yb i bX', VYffUgWXi b[Yb'j Yfk Ò\bhž'i bX'Y]b'8Ub_YgWX Òb'ZØf'X]Y < Y`ZYf'fi bXYh'XUg': Ygh'UV"

; fc» `FUX]gW. ž'VY_Ubbh'ZØf'gY]bY'?]fgW.VÀi a Y'i bX'X]Y'\Yff`]W.Y I a [YVi b[ž'`ÀXh'U``Y'Y]bž'X]YgYg'gW.ÒbY': Ygh'ni 'ZY]Yfb"'K Yf Y]ba U``X]Y'\Yff`]W.Y'5i gg]W.h'j ca 'VYfØ\a hYb'A cbi a YbhVYf[[YbcggYb'\Uhž'k]fX'b]W.h'bi f'j cb'XYf'BUhi fž'gcbXYfb'Ui W.'j cb XYf'\Yfn`]W.Yb'8cfZ[Ya Y]bgW.UZh'VYY]bXfi W_h'gY]b"'K YfZYb'G]Y Y]bYb'6`]W_'Ui Z'X]Y'JYfUbghU`hi b[Yb'i bX'[Yb]Y»Yb'G]Y'XUg?]fgW.YbZYgh']b'XYf'CVYf`Ui q]hn°

 $: \emptyset f `k Y] h Y f Y ` \pm D Z c f a U h] c b Y b ` n i \ a ` K Y h h V Y k Y f V ` i \ b X ` X Y b ` C Y g h `] W Y b ` G] Y ` X] Y ` Z c ` [Y b X Y b ` G Y] h Y b . ` A 8 F ž ` G A W g] g W Y ž ` C g h g U W g Y b "$

8 YhU]`g	
Cfh	; fc» FUX]gW\ž'8Yi hgW\`UbX
EiY``Yb	• k k k "a Xf"XY
	k k k "gUYWX g]gWX Y"XY
	cghgUWX gYb"XY

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