

' \$'\J\fY'7"<"697?'K =GG9B. \(\daggarrightarrow\) \(\daggarrightarrow\) \(\daggarrightarrow\) \(\daggarrightarrow\) \(\daggarrow\) \(\daggarr

8]Y '6Yn]f_gVØf[Yfa Y]ghYf]b 'j cb 'A]hhY '`ÀXh'ni f \Rightarrow V]`Ài a gdfÀgYbhUh]cb 'XYf'FY]\Y'7"< "697? 'K =GG9B ']b 'XYf D\]`]dd!GWXUYZZYf!6]V`]ch\Y_'Y]b"



6fi bbYbghf"'%, %ž'%\$%%- '6Yf`]bž'8Yi hgW\`UbX'!'5a '%+"' $\stackrel{\cdot}{\Rightarrow}$ b] &\$&) 'k]fX']b'6Yf`]b'Y]b'VYXYi hYbXYg' $\stackrel{\cdot}{\Rightarrow}$ V]`Ài a '[YZY]Yfh 'X]Y '\$!' $\stackrel{\cdot}{A}$ \f][Y'FY]\Y'7"< "697?'K $\stackrel{\cdot}{\Rightarrow}$ G9B"' $\stackrel{\cdot}{\Rightarrow}$ XYf'D\]`]dd!GW\UYZZYf! 6]V`]ch\Y_'k]fX'Ub'Àgg`]W\'X]YgYg'9fY][b]ggYg'Y]bY JYf`U[gdfÀgYbhUh]cb'j ca '&("' $\stackrel{\cdot}{\Rightarrow}$ b]'V]g'ni a '+"'5i [igh'&\$&) ghUhhZ]bXYb"'8]Y'6Yn]f_gVØf[Yfa Y]ghYf]b'j cb'A]hhYž'GhYZUb]Y FYa `]b[Yfž'k]fX'X]Y'JYfUbghU`hi b['YfÒZZbYb'i bX'XUa]h'Ui Z'XYb VYY]bXfi W_YbXYb'K YfXY[Ub['X]YgYf'FY]\Y'Ui Za Yf_gUa 'a UW\Ybž X]Y'%--) 'a]h'bi f'%&'6ÀbXYb'VY[Ubb'i bX'a]hhYfk Y]'Y'ØVYf'+\$\$ gcf[ZÀ`h]['fYW\YfW\]YfhY'A cbc[fUZ]Yb'i a ZUggh''

8]Y'7"<"697?'K ←GG9B!FY]\Y'k i fXY'j cb'j]Y'Yb'U'g
I b]j YfgU'V]V`]ch\Y_'XYg'K]ggYbg 'VYnY]W\bYhž'k]Y'X]Y'BYi Y
NØfW\Yf'NY]hi b['ZYghghY``h"'G]Y'XYW_h'Y]bY'J]Y`nU\``j cb'H\Ya Yb
UVž'Y]bgW\`]Y» `]W\'; YgW\]W\hYž'Dc`]h]_ž'D\]`cgcd\]Y'i bX
BUhi fk]ggYbgW\UZhYb"'Ni a '¾ V]`Ài a 'k YfXYb']a ': fØ\'U\f'&\$&)
nY\b'bYi Y'H]hY``j YfÒZZYbh`]W\hž'XUfi bhYf'gdUbbYbXY'K Yf_Y'j cb
J c`_Yf'FY]b\UfXh'ni f'; YgW\]W\hY'XYf'K Y`h'i bX'Y]bY'_ca dU_hY
6]c[fUZ]Y'j cb'<UbbU\'5fYbXh'j cb'H\ca Ug'A YmYf'Ub`Àgg`]W\']\fYg
) \$"'HcXYghU[q"

6YgcbXYfY'5i gghY``i b[']b'XYf'D\]`]dd! GWXUYZZYf!6]V`]ch\Y_

 $8]Y \cdot 5i gghY \cdot i b[\cdot]b \cdot XYf \cdot D \setminus] \cdot]dd!GW \cdot UY ZZYf!6]V \cdot]ch \setminus Y_ \cdot k \cdot]fX \cdot b]W \cdot h \cdot bi f X]Y \cdot bYi \cdot Yb \cdot H]hY \cdot XYf \cdot 7'' < ''697? \cdot K = G9B!FY] \setminus Y \cdot df AgYbh]YfY b z gcb XYfb \cdot Ui \ W \cdot 9I \ dcb UhY \cdot Ui \ g \cdot XYf \cdot ; \ YgW \]W \cdot hY \cdot XYf \cdot FY] \setminus Y \cdot gY \cdot Vgh nY][Yb'' \cdot 8]Y \cdot Nk \ Y]hYI \ Ya \ d \ UfY \cdot XYf \cdot Ui \ g[YghY \cdots hYb \cdot 60W \ Yf \cdot k \ Yf XYb \ Ui \ g \ Y] \ VUf \ gY]b \ z' k \ A \ fYb X \ X]Y \cdot 5i \ gghY \cdots i \ b[\ gYI \ Ya \ d \ UfY \]a \ 6]V \]ch \ Y_gV \ YghUb X \ j \ YfV \ Y]V \ Yb'' \ 8]Y \ D\] \]dd! \ GW \ UY \ ZZYf! \ 6]V \]ch \ Y_V \ VYZ]b \ XYh \ \ g]W \ \ ']b \ XYf \ 6fi \ bb Yb \ ghf'' \ '%, \ % \ '% \ '% \ - '6Yf \]b \ z' i \ b X' \]gh'j \ cb \ A \ cbhU[\ V \]g' \ fY]hU[\ 'nk \]gW \ Yb \ '% \ .$$ \ ' b X' \ - ' \ $ 'I \ f' \ gck \]Y \ gUa \ ghU[g'j \ cb \ '% \ .$$ \ 'V \]g' \ (.$$ 'I \ f' [Y \ O \ ZZb Yh'' \ \ '$

8]YgY'JYfUbghU'hi b[']gh'HY]'Y]bYg'i a ZUggYbXYb
?i `hi fdfc[fUa a g']b'6Yf`]b!A]hhYž'XUg'Ui WX'XYb
8fUi »Yb@Ui gWXYb.'9fnÀ\`gca a Yf 'i a ZUggh"8]YgY'gdYn]Y``Y
JYfUbghU'hi b['ZØf'?]bXYf'i bX': Ua]']Yb'Z]bXYh'j ca '' \$"'\$ b]'V]g'%, "
\$`]'&\$&) ']b'XYb'@YgY[AfhYb'i bX': fY]ZAWXYb'j cb'gYWXg
6]V`]ch\Y_Yb'ghUhh"8]Y'HY]`bU\a Y'Ub'XYb'9fnA\`i b[Yb']gh
_cghYb`cg'i bX'V]YhYhY]bY'\Yfj cffU[YbXY'; Y`Y[Yb\Y]hž'@]hYfUhi f
]a ': fY]Yb'ni '[Yb]Y»Yb"

7ca]WUi gghY``i b[Yb i bX 6i W\ dfYa]YfYb

 $8 \ Uf \emptyset VYf`\]bUi g`k]fX`X]Y`GhUXhV]V`]ch\ Y_`A]hhY`j ca `&\%''`A U]`V]g ni a `&\$''`$\`]`&\$&) `Y]bY`dUfU``Y`Y`5i gghY``i b[`dfÅgYbh]YfYbž`]b`XYf %- `7ca]Wj Yf`U[Y`]\f`U_hi Y``Yg`Dfc[fUa a `j cfghY``Yb"`8]YgY$

: $\emptyset f$: $fU[Yb cXYf k Y]hYfY <math>\Rightarrow Zcfa Uh]cbYb ghY h XUg 6Yn]f_gUa h A]hhY [YfbY ni f J YfZ<math>\emptyset$ [i b["A YX]YbUbZfU[Yb _\ObbYb Ub X]Y DfYggYghY \ Yi bhYf \ dfYggY 4 \ VU!a]hhY \ "VYf \]b "XY [Yf]WXhYh k YfXYb"

8 YhU]`g	
Cfh	6fibbYbghf":%,%ž:%\$%%-:6Yf`]bž:8YihgWX`UbX
EiY``Yb	• k k k "VYf`]b"XY
	• k k k "W\ V Y W_ "X Y
	• k k k "VYf`]b"XY

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