

DUc`]b]'j Yf`]Yfh'XfUa Uh]gWk.'Gk]hc`]bU']a J]YfhY`Z]bU`Y'XYf': fYbWk'CdYb°

9`]bU'Gj]hc`]bU'VY[Y]ghYfh'VY]'XYb': fYbW\'CdYb'&\$&) ž k λ fYbX'DUc`]b]'ØVYffUgW\YbX']a '5W\hY`Z]bU`Y'Ui ggW\Y]XYh"



=b^]\fYa ^bAWXghYb^A UhWX^_ObbhY^Gj]hc^]bU^Ui Z'X]Y^U_hi Y^Y

 $H]hY`j YfhY]X][Yf]b`== U`Gk]UhY_`cXYf`X]Y`ghUf_Y`¾`YbU`F mVU_]bU hfYZZYbž`X]Y`VY]XY`]b`XYf`Xf]hhYb`FibXY`UbhfYhYb"`FD`Cb`]bY VYf]W\hYhž`XUgg`X]Y`I_fU]bYf]b`]\fY`@Y]ghib[`VYgh\hX][`ghY][Yfb_cbbhY"$

Bcj U_ 8 ^c_cj]WXca]b]Yfh XUg Hi fb]Yf

9]b k Y]hYfYg`\YfUi gfU[YbXYg`A UhW\``]YZYfhY`Bcj U_'8 $^{\circ}$ _cj]WUV" 8 Yf gYfV]gW\Y`Gi dYfghUf`nY][hY`g]W\`]b '6 YghZcfa `i bX`VYg]Y[hY :]`]d 'A]gc`]Wa]h'*.' $^{\circ}$ Z'*.($^{\circ}$ Z'*.&"'8]Yg`]gh`XUg`bYi bhY`A U``]b`: c`[YŽ XUgg`8 $^{\circ}$ _cj]W]b`Y]bYa '9]bnY`a UhW\`VY]`XYb`: fYbW\`CdYb`c\bY GUhnj Yf`i gh`V`Y]Vhž'k Ug`gY]bY`8 ca]bUbn`Ui Z`XYa `D`Uhn i bhYfghfY]W\h"'=b`XYf`bÀW\ghYb`Fi bXY`hf]ZZh`Yf`Ui Z`7 Ua Yfcb Bcff]Y"'HYbb]g'*) `\YVh`\Yfj cfž`XUgg`8 $^{\circ}$ _cj]WUi W\`j cf`gY]bYa Gd]Y``NY]h`a]h`gY]bYa `Gc\b`GhYZUb`j YfVfUW\hYž'k Ug`gY]bY

 $5VYf'b]WXh'bif'8 ^c_cj]Wgd]Y`h'ghUf_"'5`YIUbXYf'NjYfYj'YffY]WXhYXUg'5WXhY`Z]bU`Yž']bXYa 'Yf': `Uj]c'7cVc``]'a]h'*.&ž'+.*'fh.(\{\frac{1}{2}\text{*}.\%VYg]Y[hY"'=a 'b\AWXghYb'A UhWX'k UfhYh'HU``cb'; f]Y_gdccf'Ui Z'XYb 8Yi hgWXYb"'\{\frac{1}{2}\text{b}}\]_'G]bbYf'nY][hY'YVYbZU``g'Y]bY'VYY]bXfi \(W_YbXY \) @Y]ghi b['i bX'[Yk Ubb'[Y[Yb'\{\frac{1}{2}\text{b}}]''@Y\YW_U'_`Uf'a]h'*.\$\frac{1}{2}\text{*}.\%\frac{1}{2}\text{*}.\%'' \\ =a 'b\AWXghYb'Gd]Y`'hf]ZZh'Yf'Ui Z'5bXfY'^Fi V`Yk''$

BY[Uh]jY, VYffUgWib[YbibXGhUh]gh]_Yb

Hfchn'XYf'dcg]h]j Yb'BUWXf]WXhYb'[UV'Yg'Ui WX'V]hhYfY

9bhhÀi gWXi b[Yb"'?Yj]b'?fUk]Yhn'i bX'H]a 'DØhn'a i gghYb'g]WX']a

8cddY'k YhhVYk YfV'[YgWX`U[Yb'[YVYbž'U`g'g]Y'[Y[Yb'\frac{1}{2}]Ub'8cX][i bX'Cf`UbXc'@in'Ui g'XYa 'Hi fb]Yf'Ui ggWX]YXYb"'8Ub]]`

A YXk YXYk 'k Uf'YVYbZU``g'b]WXh'j ca '; 'ØW_'j Yfk Ò\bh'i bX'gWX]YX

VYfY]hg']b'XYf'YfghYb'Fi bXY'[Y[Yb'7Ua Yfcb'Bcff]Y'Ui gž'k Ug

j]Y`Y': Ubg'YbhhÀi gWXhY"'HYbb]g'GhUhg'&(#+'V]YhYh'i a ZUggYbXY

GhUh]gh]_Yb'i bX'5bU`mgYb'ni 'X]YgYb'i bX'k Y]hYfYb'A UhWXYg"

6Y] XYb 5i g[YgWX]YXYbYb g]bX Ui WX Y]b][Y [YgYmhY Gd]Y Yfž XUfi bhYf @cfYbnc A i gYhh] fl + £ VY] XYb < YffYb i bX 8 Uf]U? UgUh_]bU fl + £ gck [Y 9]gY A YfhYbg fl, £ VY] XYb 8 Ua Yb Ni XYa

8 Y hU]`g	
J c f ZU``	Gcbgh][Yg
Cfh	DUf]gž': fUb_fY]W\
EiY``Yb	• fd!cb`]bY"XY
	• k k k "hYbb]g' *) "Wca
	 XY "hY b b]gghUhg&(+ "Wc a

6Ygi WXYb G]Y i bg Ui Z b!U[bYh