

Ni _i bZh'XYf'gcn]U`Yb'G]W\Yf\Y]h. 8][]hU`]g]Yfi b[']b'9i fcdU']a': c_i g

9f`YVYb`G]Y`XUg`%' "'9i fcdU!?c``cei]ia ']b`6Yf`]bžXUg`g]W\
a]h`XYf`8][]hU`]g]Yfib[']b`XYf`gcn]U`Yb`G]W\Yf\Y]h
VYgW\AZh][h"FibX`%') 'JYfhfYhYf`Uig`&- '@AbXYfb`X]g_i h]YfYb
ØVYf`<YfUigZcfXYfib[Yb`ibX`@Ogib[Yb`ZØf`XYb`X][]hU`Yb
5ighUigW\'jcb`Gcn]U`jYfg]W\Yfib[gXUhYb"'9fZU\fYb`G]Y
a Y\f`ØVYf`XUg`9I!D]`chdfcY_h`8][]hU`Y`BUW\kY]gY`ZØf
9ifcdU 'ibX`XUg`99GG+GmghYaž`XUg`XYb
[fYbnØVYfgW\fY]hYbXYb`8UhYbhfUbgZYf`fYjc`ih]cb]Yfh"
\DZcfa]YfYb`G]Y`g]W\'ØVYf`X]Y`Ni_ibZh`XYf`gcn]U`Yb
G]W\Yf\Y]h`]b`Y]bYf`X][]hU`Yb`KY`h°



6Yf`]b`k]fX`ni a `<chgdch`XYf`X][]hU`Yb`FYj c`i h]cb`]b`XYf
gcn]U`Yb`G]WXYf\Y]h°`5a `%) "i bX`%* "`C_hcVYf`hf]ZZh`g]WX`X]Y
9`]hY`XYf`Yi fcdÀ]gWXYb`Gcn]U`j Yfg]WXYfi b[ghfÀ[Yf`]b`XYf
<Ui dhghUXh` i bX`XUg`i bhYf`XYa `Vf]gUbhYb`A chhc.
8][]hU`]g]Yfi b[`]b`XYf`gcn]U`Yb`G]WXYf\Y]h.
Ni _i bZhqdYfqdY_h]j Yb`ZØf`9i fcdU "

FibX'%') 'JYfhfYhYf'Uig'&-'@ÀbXYfb'\UVYb'g]W\'j YfgUaaY`hzia ØVYf'X]Y'VfYbbYbXYb'H\YaYb'XYf'gcn]U`Yb'5Vg]W\Yfib['ibX'XYbV`]hngW\bY``Yb'X][]hU`Yb'5ighUigW\'jcb'Gcn]U`jYfg]W\Yfib[gXUhYbni'X]g_ih]YfYb"'9]b'H\YaUz'XUg'ZØf'j]Y`Y'6Øf[Yf'jcb'nYbhfU`Yf6YXYihib[']gh'K]Y'VY\À`hiaUb'U`g'5fVY]hbY\aYf'cXYf'FYbhbYfXYb', VYfV`]W_'ØVYf'U``Y'5bgdfØW\Y']b'9ifcdU3'8]Y'5bhkcfh_ObbhY'Y]b'VYggYfYf'8UhYbUighUigW\'nk]gW\Yb'XYbj'Yb'gY]b"

9]b fYj c`i h]cbÀfYf GWX f]hh '99GG=]a : c_i g

9]b X]Ua UbhYbYf'A ca Ybh'ZØf'X]Y'8][]hU`]g]Yfi b['XYf FYbhYbj Yfg]W\Yfi b[']gh'VYfY]hg'YffY]W\h' 8 Ug']bbcj Uh]j Y'GmghYa XYg' 9`Y_hfcb]gW\Yb'5i ghUi gW\g'j cb'Gcn]U'j Yfg]W\Yfi b[gXUhYb fP9GG \pm '\Uh'X]Y'HØfYb'ZØf'Y]bYb'gW\bY``YfYb'i bX'YZZ]n]YbhYfYb 8 UhYbUi ghUi gW\'[YÒZZbYh'', VYf'&"+\$\$'\delta gh]hi h]cbYb'Ui g'XYf'9I ž XYa '9K Fž'XYf'GW\kY]n'i bX'; fc \ast Vf]hUbb]Yb'g]bX'VYfY]hg'j YfbYhhh' 9]b'YfghUi b`]W\Yf': cfhgW\f]hh' 'VYfY]hg'\%\$\$'A]``]cbYb'BUW\f]W\hYb k i fXYb'\ØVYf'99GG\delta [YhUi gW\h'''9]b'fY]Vi b[g`cgYf'5V`Ui Zž'XYf FYbhYbVYfYW\bi b[Yb'Ui Z'; fi bX`U[Y'j cb'5fVY]hgnY]hYb']b j YfgW\]YXYbYb'\@\bXYfb'Ybcfa 'VYgW\`Yi b][h'

: cfhgW\f]hh` 'XUg']gh'Y]bY'bYi Y'\qquad fU'XYf'Yi fcd\angle a YbUfVY]h°'

8]Y'Ni_i bZh'bYi [YghU`hYb.'D]`chdfc^Y_h 87(91

9]b'k Y]hYfYg'<][\`][\h'XYg'?c``cei]i a g']gh'XUg'Ui ZfY[YbXY'9I!D]`chdfc Υ_h ' 8][]hU`Y'BUWkY]gY'ZØf'9i fcdU 'f87(9I &"I bhYf'XYf':YXYfZØ\fi b['j cb'; i bXi `U'Fc» VUWk'k]fX'XUg'Dfc Υ_h 'j cb'[fc» Yf6YXYi hi b['gY]b.'9g'n]Y`h'XUfUi Z'UVž'6]`Xi b[g!'i bXGcn]U`j Yfg]WkYfi b[gbUWkkY]gY'ni 'X][]hU`]g]YfYb'i bX'ni j Yf]Z]n]YfYb"'=a 'NYbhfi a 'ghY\Yb'XUVY]'X]Y'9i fcdÀ]gWkY?fUb_Ybj Yfg]WkYfi b[g_UfhY'i bX'X]Y'5%!6YgWkY]b][i b["'

 $8] YgY `X][] hU`Yb`BUW k Y] gY `k YfXYb`] b`Y] bYf`g] W YfYb`Y = 8 5G! \\ _cbZcfa Yb`X][] hU`Yb`6f] YZhUgW Y`fK U``YhŁ`Ui ZVYk U\fh"`9] b`GW f] hh] b`X] Y`Ni _i bZhž`XYf`b] W h`bi f`g] W Yfž`gcbXYfb`Ui W bi hnYfZfYi bX`] W `]gh`$

 $8 \ Ug ?? \ c ``cei]i \ a \ 'j \ Yfgdf] W. \ h'b] W. \ h'b i \ f'gd Ubb Yb XY `8] g_i \ gg] \ cb Yb z \ gcb XYfb `Ui \ W. \ VYY] b Xfi \ W_Yb XY `Df Ag Yb hUh] \ cb Yb " `8] Y `J = J 9GG! \ 5 dd \ z `Yb hk] W_Y `h' ZØf `gd Ub] gW. Y `F Yb hYb Ya \ d Z Ab [Yf'] a `5 i g`Ub X z \ k] f X' j \ cb `B i f] `F Ua \ cg' j \ cf[Ygh Y ``h'' 8] Yg Y `] b b c j Uh] j Y `5 b k Yb Xi b [[Yk A\f`Y] gh Yh' X] Y @Y V Y b g V Ygh Ah] [i b [`ZØf `F Yb hb Yf z `X Ua] h' X] Y F Yb h Yb n U\`i b [Yb `c\b Y `I b h Yf V f Y W. i b [`Zc fh [YZØ \ fh' k Yf X Y b _Obb Y b"]$

 $GY]YbG]YVYfY]hZØfX]YX][]hUYFYjcih]cbG8]YNi_ibZhXYf gcn]UYbG]WXYfY]hJbGifcdUk]fXbJWXhbifX]g_ihJYfhZgcbXYfbU_hJjGYqhUhYhG$

.

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