

: 7 '6 UgY` 'gU[h'Dc_U`ZY]Yf'UV. ': Ub 'bUW I bZU`` 'gWk Yf'j Yf`Yhnh°

 $8 \ Yf': 7 \ 6 \ UgY``\ Uh'gY]bY'Dc_U`ZY]Yf'bUW `XYa'; Yk]bb'[Y[Yb: 7 \ 6]Y``UV[YgU[hž'bUW XYa'Y]b': Ub'gW k Yf'j Yf`Yhnh'k i fXY"$



6U\b\cZ'K Ub_XcfZž'6Yfbž'GWk Y]n'!'8Yf': 7'6UgY``\Uh'X]Y'ZØfGcbhU[UVYbX'[Yd`UbhY'H]hY`ZY]Yf'bUW\'XYa'; Yk]bb'XYgGWk Y]nYf'Dc_U`g'UV[YgU[h"'8Yf'; fi bX'ZØf'X]YgY'9bhgW\Y]Xi b[]gh'X]Y'gWk YfY'J Yf`Yhni b['Y]bYg'6UgY`Yf': i » VU``ZUbgž'XYf'VY]Y]bYa'I bZU```Ua'6YfbYf'6U\b\cZ'K Ub_XcfZ'VYhfcZZYb'k Uf"'8Yf': Ub'a i gghY'i a [Y\YbX'a YX]n]b]gWk'j Yfgcf[h'k YfXYbž'k Ug'ni f I bhYfVfYWki b['XYf'6U\bghfYW_Y'nk]gWkYb'6Yfb'i bX'C`hYb'ZØ\fhY"

♣b'Y]bYf'GhY``i b[bU\a Y'XYg'J YfY]bg'k i fXY'VYhcbhž'XUgg'X]Y
; Ygi bX\Y]h'XYg'J Yfi bZU``hYb'cVYfghY'Df]cf]hÀh'\UVYž'i bX'a Ub k ØbgWkhY']\a 'gWkbY``Y'; YbYgi b["

 \exists 'Dc_U`Z]bU`Y '\ UhhY 'XYf': 7 '6UgY``Y]bXfi W_gj c```[Y[Yb 'XYb ': 7 6]Y``a]h'(.%'[Yk cbbYb" '9g'k Uf'XYf'%("'Dc_U`g]Y[']b 'XYf

JYfY]bg[YgWk]WkhYiibXiXUgig]YVhYi8ciViY"L\YfXUbiG\Ue]f]žiXYf]biX]YgYaiGd]Yiiy]bYbi9iZaYhYfijYfkUbXYihYiibXiXUa]hiXUgnk]gWkYbnY]hi]WkYi&.%iYfn]YihYžiVYghÀh][hYiY]baUiiaY\figY]bYk]Wkh][YiFciiyiZØfiXUgiHYUa"i8YfiiYhnhYiDc_Uig]Y[iXYgi:7i6UgYiZUbXiVYfY]hgi&\$%-ighUhh"

5 V [YgU[hY : Y]Yf`]WX _Y]hYb

8]Y: Y]Yfigc``hYiUa i6UfZØggYfd`Uhni]biXYfi5`hghUXhij cbi6UgY`ghUhhZ]bXYbžik ciX]YiA UbbgWkUZhii bXi]\fY: Ubgi]\fYi9fZc`[Y[Ya Y]bgUa iZY]Yfbik ci`hYb"8cWkiUb[Yg]WkhgiXYfiI a ghÀbXYYbhgWk]YXYbiX]YiJYfUbhk cfh`]WkYbžiX]Yi: Y]YfbiUVni gU[Yb"8YfJYfY]bifYU[]YfhYia]hi6YXUiYfbiUiZiX]YiBchk YbX][_Y]hiX]YgYf9bhgWkY]Xib[iibXijYfg]WkYfhYigY]bYbi: UbgžiXUggia Ubi]b; YXUb_YbiVY]iXYa ijYf`YhnhYbi5b\Àb[YfigY]"

8]Y?Ubhcbgdc`]nY]'k Uf'Ua 'I bZU``cfh']a '9]bgUhnž'_cbbhY'YXcW\
_Y]bY'k Y]hYfYb' \(\delta\) Zcfa Uh]cbYb'ni 'XYb'[YbUiYb'I a ghÀbXYb'XYg
I bZU``g'VYfY]hghY``Yb"'Gc`WXY'JcfZÀ``Y'k YfZYb'b]WXh'bi f'Y]bYb
GWXUhhYb'Ui Z'X]Y': Y]Yf`]WX_Y]hYbž'gcbXYfb'Yf]bbYfb'Ui WX'Ub'X]Y
JYfUbhk cfhi b[ž'X]Y'gck c\``JYfY]bY'U`g'Ui WX'5b\Àb[Yf']b'6Yni [Ui Z'G]WXYf\Y]h'i bX'; Ygi bX\Y]h'hfU[Yb"

<]ghcf]gWXYf'?cbhYlh</pre>

 $8 \ Yf: 7.6 \ UgY`z'[Y[fØbXYh']a "$J\backslash fY`\%, -' z'\ Uh'g]W`VYfX]Y`$J\backslash fY U`g'Y]bYf'XYf'YfZc`[fY]W ghYb'?`i Vg'XYf'GW k Y]n'YhUV`]Yfh"$$ a]hhYb'X]YgYf'9fZc`[Y'g]bX'Ui W\'Y]bY'J]Y`nU\`'j cb$$ < YfUi gZcfXYfi b[Yb'ni 'a Y]ghYfb"'8Yf'GW k Y]nYf': i >> VU```\Uh'Y]bY`Ub[Y'; YgW]W hYz'X]Y'V]g']b'X]Y'%, +Yf'J\ fY'ni fØW_fY]W\ hz'U`g X]Y'YfghYb'JYfY]bY']bg'@YVYb'[Yfi ZYb'k i fXYb"'8]Y'; fØbXi b['XYfGW k Y]nYf]gW\Yb': i ggVU``!5ggcW]Uh]cb']a '$J\f'%, -) 'a Uf_]YfhYY]bYb'k Y]hYfYb': cfhgW\f]hh']b'XYf'9bhk]W_`i b['XYg'Gdcfhg']b'XYfGW k Y]n"$

8]Y'; YgW\]W\hY'XYg': i » VU``g'\]Yfni `UbXY']gh'j cb'j]Y`Yb'< Ò\Yb i bX'H]YZYb'[YdfÀ[h"'A]h'nU\`fY]W\Yb'@][U!'i bX'Dc_U`YfZc`[Yb gd]Y[Y`h'XYf': 7'6UgY`'b]W\h'bi f'gdcfh`]W\Y'9fZc`[Y'k]XYfž'gcbXYfb

±bg[YgUa h'V`Y]Vh'XYf': 7'6UgY`Y]b'Gma Vc``ZØf'X]Y'fY]WXY
: i » VU``_i `hi f'XYf'GWXkY]nž'gc[Uf']b'A ca YbhYb'XYg'6YXUi Yfbgž
k]Y'XYf'U_hi Y``Yb'G]hi Uh]cbž'X]Y'Xi fWX'XYb'VYXUi Yf`]WXYb'J cfZU``
ØVYfgWXUhhYh'k]fX"

: Øf'k Y]hYfY' ⇒Zcfa Uh]cbYb'i bX'l dXUhYg'ni f'U_hi Y``Yb'@U[Y'_Ubb X]Y'6Yf]W\hYfghUhhi b['j cb'a Un!cb`]bY"XY'i bX'hU[Yggd]Y[Y`"XY _cbgi `h]Yfh'k YfXYb"

 $: \emptyset f' + bhY fY gg]Y fhY 'Ub'XY f'; YgWX]WX hY'XY g'GWX k Y]nY f': i > VU``gV]Y hY h'X]Y'GY]hY'ZW_cYb]n"WX'k Yfhj c``Y'9]bV`]W_Y"$

8 Y hU]`g	
JcfZU``	JYf_Y\fgi bZU``
Cfh	6U\b\cZK Ub_XcfZz6YfbzGWkY]n
J Y f`Y hnhY	%
EiY``Yb	• k k k "a Un!cb`]bY"XY
	k k k "hU[Yggd]Y[Y`"XY
	k k k "ZW_cYb]n"WX

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