

6U\bWXUcg`]b`?O`b.`GhfYW_YbgdYffib[Ua`<UidhVU\b\cZ'VYhfcZZYb°

5_hi Y``Y`GhÒfi b[Yb`]a `Ni [jYf_Y\f`nk]gW\Yb`?Ò`b`i bX Hfc]gXcfZ'Ua `&* "'> b]`&\$&) . `I fgUW\Ybž'VYhfcZZYbY`NØ[Y`i bX 5`hYfbUh]jYb"



8 Yi hnž'8 Yi hgWX`Ub X`!`K]Y`Yg`gWXY]bhž`\UVYb`DYbX`Yf`i bX

FY]gYbXY`]b`? O`b`\Yi hY`A cf[Yb`Y]bY`i bYfZfYi`]WXY`, VYffUgWXi b[
Yf`YVh"`5a `&* "'¬i b]`&\$&) `k i fXY`i a `_i fn`bUWX`) `I \f`Y]bY`GhÒfi b[
Ui Z`XYf`6U\bghfYW_Y`nk]gWXYb`XYa `? O`bYf`< Ui dhVU\b\cZ`i bX

Hfc]gXcfZ`[Ya Y`XYh"`8]YgY`VYhf]ZZh'j cf`U``Ya `X]Y`NØ[Y`XYf`@]b]Yb

F9, ž`F9- `i bX`F6&+ž`X]Y`XYfnY]h'b]WXh'k]Y`[Yk c\bh'j Yf_Y\fYb
_ObbYb"`8Ug`VYf]WXhYh'XYf`9I dfYgg"

 $8]Y T fgUWX Y ZØf X]Y T bhY fV fY WX i b [`XY f `Ni [j Y fV]b Xi b [`g]b X FY d U f U hi f U f V Y]hY b `U b `XY f `Ghf Y W_Y " @Y]XY f `[]V h `Y g `ni a a ca Y b h U b Y b `NY]hd i b _h `_Y]b Y `9] b gWX À hn i b [ž `k U b b `X]Y `GhÒ f i b [VY \ c V Y b `g Y]b `k]f X " 8 U \ Y f `g c ``hY b `F Y]g Y b X Y `U `hY f b U h]j Y : U \ fa Ò[`]WX _Y]hY b `]b `6 Y h f U WX h `n]Y \ Y b " <]Y f `V]Y hY b `g] WX `X]Y `N Ø[Y$

XYf`@]b]Yb`G\&`cXYf`G\-'nk]g\XYb`?O`b!9\fYbZY`X`ibX`Hfc]gXcfZUb"

$9]bV^{M} = b + cf + f = f +$

 $8] YgY ``U_hi Y``Y ``6YY] b hfà W h] [ib[`fY] hg] W ``] b Y] b Y `FY] Y 'jcb GhÒfib[Yb']a ``? O`bYf'6U \bbYhn'Y] b "`6YfY] hg `nk] gW Yb `XYa ``&" `ibX %- "`AU]`&$&) `_Ua `Yg `ni `aUgg] jYb ``9] bgW fàb_ib[Ybž'U`g`X] Y ``] b_gf \Y] b] gW Y`Ni [ghf Y W_Y `nk] gW Yb `? O`b `ibX `?cV`Ybn'kY[Yb 5fVY] hYb `Ub `Y] bYa `bYiYb YYY_hfcb] gW Yb `GhY``kYf_'jc``gh AbX] [[Ygd Yffh'kif XY"'6Yhfc ZZYb'kUfYb'UiW `NØ[Y'k]YF9') `fFFL Ł ŽF6 &* `ibX `=79! Gdf] bh Yf" \D`X] YgYb `: A``Yb'kif XYY] b GW] YbYbYfgUhnj Yf_Y\f'Y] b[Yf] W hYh ZXYf `X] Y `bchkYbX] [Yb JYfV] bXib[Yb'ghY``Yb'gc``hY Z'gc'_cY`b" XY"$

5i Z'XYf'fYW\hYb'F\Y]bgY]hY'_Ua 'Yg'YVYbZU``g'ni
9]bgW\fÀb_i b[Ybž']bgVYgcbXYfY'ZØf': U\fhYb'nk]gW\Yb'?Ò`b'i bX
<cffYa 'cXYf'9i g_]fW\Yb"'5i W\'\]Yf'k UfYb'NØ[Y'k]Y'F9'%'fFFL\Z
F9', ž'F9'- ž'gck]Y'X]j YfgY'FY[]cbU`VU\bYb'VYhfcZZYb"'8]Y

\[
\darple\]h]Uh]j Y' GhÒfi b[Yb']a '6U\bj Yf_Y\f']gh'XUVY]'Y]bY'k Yfhj c``Y

\[
\darple\]Zcfa Uh]cbgei Y``Y'ZØf'FY]gYbXYž'i a 'ØVYf'U_hi Y``Y

9bhk]W_`i b[Yb'i bX'Yj Ybhi Y``'YfZcfXYf`]W\Y'I a `Y]hi b[Yb
]bZcfa]Yfh'ni 'V`Y]VYbž'k]Y'X]Y'K YVg]hY'ghcYfi b[Yb!

VU\bj Yf_Y\f"XY'nY][h"

K Ugʻhi bʻVY] GhÒfi b[Yb3

 $: \varnothing f'X]Y'VYhfcZZYbYb'FY]gYbXYb'V'Y]Vh'ni' ``cZZYbž'XUgg'X]Y\\ FYdUfUhi fUfVY]hYb'n\varnothing[]['UV[YgWX`cggYb'k YfXYb'_ObbYb'' Gh'Ofi b[Yb'k]Y'X]YgY'g]bX']a 'XYi hgWXYb'6U\bbYhn''Y]XYf'_Y]bY\\ GY`hYb\Y]h'''CZh'g]bX'g]Y'Xi fWX'Ài <math>*YfY'9]bZ'\varnothing ggY'k]Y'i a [Ygh\varnothing fnhY 6Ài a Y'cXYf'hYWXb]gWXY'8YZY_hY'Ub': U\fnYi [Yb'VYX]b[h'': Øf'U``YžX]Y'fY[Y`a À*]['Ui Z'XUg'6U\bbYhn'Ub[Yk]YgYb'g]bXž']gh'YgfUhgUa ž'ghYhg'X]Y'U_hi Y``ghYb'\DZcfa Uh]cbYb'ni 'j YfZc`[Yb'i bX[Y[YVYbYbZU``g'9fgUhnj YfV]bXi b[Yb'Y]bni d`UbYb''$

K À\fYbX'XYf'XYfnY]h][Yb'GhÒfi b['_Ubb'a Ub'gY\f'[i h'Ui Z 5`hYfbUh]j Yb'ni fØW_[fY]ZYbž'i a 'XcW\'bcW\'dØb_h`]W\'Ubg'N]Y`'ni

_ca a Yb"'K]f'\U`hYb'G]Y'Ui Z'XYa '@Ui ZYbXYbž'XUa]h'G]Y'[i h]bZcfa]Yfh'V`Y]VYb'i bX' \Rightarrow fY'FY]gYd`Ubi b['UbdUggYb'_ObbYb"

8 Y hU]`g	
Cfh	8 Yihnž8 YihgWX`Ub X
EiY``Yb	• k k k "Yl dfYgg"XY
	• k k k "_cY`b"XY
	ghcYfi b[Yb!VU\bjYf_Y\f"XY

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