

< Y]XYb\Y]a '9bhXYW_Yb.'; YgWX]WX hYž B Uhi f'i b X '? i `]bUf]_'j YfY]bh°</pre>

9bhXYW_Yb'G]Y'X]Y'W\Ufa UbhY'5`hghUXh'<Y]XYb\Y]a gž'X]Y VYY]bXfi W_YbXY'GW\`cggfi]bYž'_i `]bUf]gW\Y'<][\`][\hg'i bX i bj Yf[Ygg`]W\Y'BUhi fYf`YVb]ggY']b'XYf'FY[]cb°



K]``_ca a Yb']b'<Y]XYb\Y]a ž'Y]bYf'W\Ufa UbhYb'GhUXh']a '<YfnYb6UXYb!K ØfhhYa VYf[gž'X]Y'cZh']a 'GW\UhhYb']\fYf'[fÒ»YfYbBUW\VUfb'ghY\h''8cW\'<Y]XYb\Y]a '\Uh'gc'j]Y`'ni 'V]YhYbž'XUgg'Ygg]W\'Y]bYg'6Ygi W\g'a Y\f'U`g'k Yfh']gh''la [YVYb'j cb'a U`Yf]gW\Yb@UbXgW\UZhYb'i bX'fY]W\'Ub'; YgW\]W\hYž'Yfk UfhYh'X]W\'\]Yf'Y]bYY]bn][Ufh][Y'A]gW\ib['Ui g'hfUX]h]cbY``Ya': `U]f'i bX'a cXYfbYa@YVYb"

±b'i bgYfYf'9bhXYW_i b[gfY]gY'Xi fW\'< Y]XYb\Y]a 'bY\a Yb'k]f'X]W\
a]h'Ui Z'Y]bY'gdUbbYbXY'9f_i bXi b[ghci f"'Ni Yfgh'k YfZYb'k]f
Y]bYb'6`]W_'Ui Z'X]Y'\]ghcf]gW\Y'5`hghUXhž'k c'YXY'; UggY
; YgW\]W\hYb'YfnÀ\`h"'8Ubb'[Y\h'Yg'k Y]hYf'ni f'VYY]bXfi W_YbXYb

GWX`cggfi]bYž'k c'Xi ']b'X]Y'; YgWX]WXhY'Y]bhUi WXYb'_Ubbgh"8]Y
B Uhi f'fi bX'i a '<Y]XYb\Y]a '`ÀXh'ni 'UVYbhYi Yf`]WXYb'9f`YVb]ggYb
Y]bž'i bX'k]f'nY][Yb'X]f'X]Y'VYghYb'Gdchg'ZØf'_i `]bUf]gWXY
9bhXYW_i b[Yb"'Ni XYa '\U`hYb'k]f'X]Y'_i `hi fY``Yb'<][\`][\hg'ZØf
X]WX'VYfY]h' 'j cb'`c_U`Yb': YghYb'V]g'\]b'ni 'J YfUbghU`hi b[Ybž'X]Y
XUg'[UbnY'&J\f'ØVYf'ghUhhZ]bXYb"'I bX'_Y]bY'Gcf[Y' 'k]f'\UVYb
Ui WX'Y]b][Y'dfU_h]gWXY'H]ddg'[YgUa a Y`hž'XUa]h'XY]b'5i ZYbh\U`h
]b'<Y]XYb\Y]a 'i bj Yf[Ygg`]WX'k]fX°

A UWX 'X]WX 'VYfY]hz'X]YgY'k i bXYfVUfY'GhUXh'ni 'YbhXYW_Ybz'X]Y'k]YY]b'[i h'[Y\ØhYhYg'; Y\Y]a b]g'XUfUi Z'k UfhYhz'j cb'X]f'YbhXYW_h'ni k YfXYb°

9]bV`]W_']b'X]Y'\]ghcf]gW\Y'5`hghUXh'jcb <Y]XYb\Y]a

 $8]Y `\]ghcf]gWX Y `5`hghUXh'j cb'< Y]XYb \ Y]a `Ub'XYf'6fYbn']gh'Y]b \\ k U \ fYg' $\delta k Y `ZØf'; YgWX]WX hg! i bX `5fWX]hY_hi f]bhYfYgg]YfhY'' A]h \\]\ Yb' WX Ufa UbhYb'; UggYbž'U`hYb': UWX k Yf_\Ai gYfb'i bX'Y]bYa \\ ZUgn]b]YfYbXYb'9fVYž'n]Y \h'X]Y'5`hghUXh'6Ygi WXYf'Ui g'bU\'i bX \\ ZYfb'Ub'' <]Yf'[]Vh'Yg'j]Y``ni 'YbhXYW_Ybž'i bX''YXY'9W_Y'YfnA\`h]\fY'Y][YbY'; YgWX]WX hY''$

9]b a U`Yf]gW\Yf`GdUn]Yf[Ub[`Xi fW\ `X]Y`5`hghUXh`]gh`Y]b`A i gg"`8]Y < Ui dhghfU» Yž`X]Y`9b[Y`ghfU» Yž`\Uh`]\fYb`\]ghcf]gW\Yb`7\Ufa Y VYk U\fh`i bX``ÀXh`a]h`nU\`fY]W\Yb`_`Y]bYb`; YgW\ÀZhYbž`7UZÅg`i bX F YghUi fUbhg`XUni `Y]bž`ni `j Yfk Y]`Yb"`6YgcbXYfg`\Yfj cfni \YVYb g]bX`X]Y`: UW\k Yf_\Ài gYfž`X]Y`a]h`]\fYb`Z]`][fUbYb < c`nj Yfn]Yfi b[Yb`i bX`Vi bhYb`: UggUXYb`XUg`6]`X`XYf`5`hghUXh dfÀ[Yb"

9]b'k Y]hYfYf'VYXYi hYbXYf'Di b_h']gh'X]Y'GhUXhdZUff_]fW\Y'Gh''
\$\mu_cV\tincut^X]Y']a '%("'\times\\f\i bXYfh'YfVUi h'k i fXY'i bX'Y]bY
VYY]bXfi W_YbXY'?ca V]bUh]cb'Ui g'[ch]gW\Yb'i bX'VUfcW_Yb
9`Ya YbhYb'Ui Zk Y]gh''8]Y'?]fW\YbZYbghYf'Yfn\hanna\`Yb'V]V`]gW\Y

; $YgWX]WXhYbiibXiX]Yi_ibghjic``Ybi5`hAfYig]bXiY]bYi5i[YbkY]XY"CZhi[]VhiYgiV]YfiUiWXi?cbnYfhYiibXi_i`hifY``YiJYfUbghU`hib[YbžX]YiX]Yi5_igh]_iXYgiFUiaYgicdh]aU``bihnYb"$

8 Ug'<Y]XYb\Y]a Yf'GhUXha i gYi a ']gh'YVYbZU``g'Y]bYb'6Ygi W\
k Yfh"'9g'VYZ]bXYh'g]W\']b'Y]bYa 'XYf'À`hYghYb'; YVÀi XY'XYf'GhUXh
i bX'V]YhYh'ZUgn]b]YfYbXY'9]bV`]W_Y']b'X]Y'`c_U`Y'; YgW\]W\hYž
?i bgh'i bX'?i `hi f"'=b'XYb'j YfgW\]YXYbYb'5i gghY``i b[gfÀi a Yb
_`ObbYb'X]Y'6Ygi W\Yf'5fhYZU_hY'Ui g'j YfgW\]YXYbYb'9dcW\Yb'XYf
GhUXh[YgW\]W\hY'VYk i bXYfb'i bX'a Y\f'ØVYf'X]Y'9bhk]W_`i b['XYf

8 Yf'A Uf_hd`Uhn']gh'XUg'< YfnghØW_'XYf'5`hghUXh'i bX'cZh'GW\Ui d`Uhn ZØf'K cW\Yba Àf_hYž': YghY'i bX'UbXYfY'J YfUbghU`hi b[Yb"'<]Yf Z]bXYh'a Ub'b]W\h'bi f'Zf]gW\Y'DfcXi _hY'i bX'`c_U`Y'GdYn]U`]h\hYbž gcbXYfb'Ui W\'Y]bY'k Ufa Y'i bX'`YVYbX][Y'5ha cgd\\hY'' 6YgcbXYfg']a 'Gca a Yf'`UXYb'X]Y'nU\`fY]W\Yb'HYffUggYb'i bX'Vi bh XY_cf]YfhYb'Gh\hXY'ni a 'JYfk Y]`Yb'Y]b"'9g']gh'XYf'dYfZY_hY'Cfh\z
i a 'Y]b'k Yb][' <Y]XYb\Y]a Yf'@YVYbg[YZØ\` 'ni 'gW\bi ddYfb"

: Øf; YgWk]Wkhg]bhYfYgg]YfhY`V]YhYh`g]Wk`Ui »YfXYa `X]Y
A Ò[`]Wk_Y]hž`Ub Y]bYf`[YZØ\fhYb`GhUXhZØ\fi b[`hY]`ni bY\a Yb"
8]YgY: Ø\fi b[Yb`g]bX`cZh`gY\f`]bZcfa Uh]j`i bX``Y[Yb`XYb`: c_i g
Ui Z``c_U`Y`@Y[YbXYb`gck]Y`gdUbbYbXY; YgWk]WkhYbž`X]Y`a]h`XYb
\]ghcf]gWk`k]Wkh][Yb; YVÀi XYb`j YfVi bXYb`g]bX"*8]Y: Ø\fYf`g]bX
a Y]gh`gY\f`Yb[U[]Yfh`i bX`Vf]b[Yb`b]Wkh'bi f`K]ggYbž`gcbXYfb
Ui Wk`dYfgÒb`]WkY; YgWk]WkhYb`i bX`5bY_XchYb`a]h`]b`X]Y`Hci f"

9]b Y]bn][Ufh][Yg' <][\`][\h'XYf'5`hghUXh'j cb' < Y]XYb\Y]a ']gh'XYf?i bgh]bghU``Uh]cbYb'i bX
G_i `dhi fYb Yf[Àbnh'k]fX"'?i bgh`]YV\UVYf'\UVYb'X]Y'A $O[`]WX_Y]h$ ž
X]Y '_fYUh]j Yb'5i gXfO(Y)'`c_U`Yf'? O(Y)'`ebgh`Yf'ni 'YbhXYW_Ybž'X]Y']b
XYb'O(Y)'bh`]WXYb'FUi a ']bhY[f]Yfh'g]bX"'8]YgYf'K Y[']gh'b]WXhb'i f
Y]bY'9bhXYW_i b[ghci f'j cb'?i bghk Yf_Yb']b'XYf'5`hghUXhž'gcbXYfb
Ui WX'Y]bY'9]b`UXi b[Z(Y)'Yf'X]Y'JYfV]bXi b['nk]gWXYb'?i bghž
; YgWX]WXhY'i bX'5``hU['bUWXni XYb_Yb''

 $\label{eq:Karther} K \] WX \ h][\ Y \ Di \ b \ hY \ \check{z} \ X \] Y \ a \ Ub \] b \ X \ Y \ f \ 5 \ hghUX \ h \ V \ Y \ gi \ WX \ Y \ b \ gc \ ``hY .$

- GhUXhdZUff]fWXY'Gh"'\\ cV
- < Y]XYb\Y]a Yf GhUXha i gYi a
- A Uf_hd`Uhn
- 9b[Y`ghfU»Ya]h']\fYb: UWkkYf_\AigYfb
- ?i bghk Y[

Ni gÀhn`]WX`_Ubb`a Ub`]a `Gca a Yf`X]Y`<Y]XYb\Y]a Yf`6cW_V]YfZYgh bi hnYbži a `X]Y`5`hghUXh`]b`j c``Yb`NØ[Yb`ni `[Yb]Y»Yb"`8]YgYg': Ygh ZY]Yfh`X]Y`JYfV]bXi b[`j cb`HfUX]h]cb`i bX`; Ya Y]bgWXUZhii bX gd]Y[Y`h`XUg`\Yfn`]WXY`A]hY]bUbXYf`XYf`GhUXhVYk c\bYf`k]XYf"

8]Y'5`hghUXh'j cb'<Y]XYb\Y]a ']gh'b]Wkh'bi f'Y]b'Cfh'XYf'; YgWk]WkhYž gcbXYfb'Ui Wk'Y]b'`YVYbX][Yf'FUi a ž']b'XYa 'g]Wk'; YgWk]WkhY'i bX a cXYfbYg'@YVYb'VY[Y[bYb"'9]b'6Ygi Wk']b'X]YgYf'WkUfa UbhYbGhUXh']gh']a a Yf'Y]bY'FY]gY'k Yfh'i bX'V]YhYh'Y]bY'k]``_ca a YbY 5i gnY]h'j ca '5``hU["

8]Y'VYY]bXfi W_YbXY'GWX`cggfi]bY.; YgWX]WXhY'\Ui hbU\

8]Y'GW\`cggfi]bY'<Y]XYb\Y]a ']gh'b]W\h'bif'Y]b'a Uf_UbhYg
K U\fnY]W\Yb'XYf'GhUXhz'gcbXYfb'Ui W\'Y]b'ZUgn]b]YfYbXYg'NYi[b]g
]\fYf'\]ghcf]gW\Yb'JYf[Ub[Yb\Y]h''<cW\'cVYb'Ui Z'Y]bYa '<Ø[Y`
[Y`Y[Ybz'V]YhYh'X]Y'Fi]bY'b]W\h'bif'UhYa VYfUi VYbXY'5i gV`]W_Y
Ui Z'X]Y'GhUXh'i bX'X]Y'i a `]Y[YbXY'@UbXgW\UZhz'gcbXYfb'YfnÀ\`h
Ui W\'X]Y'; YgW\]W\hYb'j Yf[Ub[YbYf'NY]hYb"

8]Y'I fgdfØb[Y'XYf'GWX`cggfi]bY'fY]WXYb'V]g']bg'%' "'*\J\f\i bXYfh
ni fØW_"'9fVUi h'k i fXY'g]Y'j cb'XYb'; fUZYb'j cb'<Y]XYb\Y]a ži a
X]Y'ghfUhY[]gWXYb'*\bhYfYggYb']b'XYf'FY[]cb'ni 'ghÀf_Yb"'*\alla '@Ui ZY
XYf'*\J\f\i bXYfhY'Yf`YVhY'X]Y'6i f['nU\`fY]WXY'I a VUi hYb'i bX
9fk Y]hYfi b[Yb"'8Yf'9]bZi gg'XYf'j YfgWX]YXYbYb'<YffgWXYf']gh
bcWX'\Yi hY']b'XYf'5fWX]hY_hi f'i bX'XYb'j YfV`Y]VYbXYb'Ghfi_hi fYb
ni 'Yf_YbbYb"

9]b`VYgcbXYfg`VYY]bXfi W_YbXYg`A Yf_a U``XYf`Fi]bY`]gh`XYf` 6Yf[Zf]YXž`XYf`U`g`nYbhfU`Yf`5i gg]W\hgdi b_h`X]YbhY"`9f`Yf\YVh g]W\`a U^YghÀh]gW\`ØVYf`X]Y`I a [YVi b[`i bX`]gh`Y]b`VY`]YVhYf`Cfh ZØf: chc[fUZYbibX; YgWX]WXhg]bhYfYgg]YfhY"8Yf5i Zgh]Y[iØVYfX]YinU\`fY]WXYbiHfYddYbi]ghink UfiUbghfYb[YbXž'XcWXiX]Y5i gg]WXhž'X]Yig]WXij cbicVYbiV]YhYhži]ghiX]YiA Ø\Yik Yfh"

8]Y'Fi]bY'gY`Vgh']gh']b'Y]bYa 'VYa Yf_Ybgk YfhYb'Ni ghUbX'XYf
9f\U`hi b["'K À\fYbX'XYg'6Ygi W\g'_ObbYb'X]Y'6Ygi W\Yf'X]Y
, VYffYghY'j cb'Y\Ya U`][Yb'K c\bfÀi a Ybž'K UZZYb`U[Yfb'i bX
JYfhY]X][i b[gUb`U[Yb'VYg]W\h][Yb"'J]Y`Y'\DZcfa Uh]cbghUZY`b
Ybh`Ub['XYg'Fi bX[Ub[g'[YVYb'gdUbbYbXY'9]bV`]W_Y']b'XUg'@YVYb
XYf'XUa U`][Yb'NY]h'i bX'X]Y'6YXYi hi b['XYf'6i f['ZØf'X]Y'FY[]cb"

9]b'k Y]hYfYg'<][\`][\h']gh'XYf'Y]ba U`][Y'GW\`cgg\cZž'XYf']b'XYb k Ufa Yb'A cbUhYb'U`g'J YfUbghU`hi b[gcfh'ZØf'j YfgW\]YXYbY _i `hi fY``Y'9j Ybhg'[Ybi hnh'k]fX"'<]Yf'Z]bXYb'fY[Y`a À»]['?i bgha Àf_hYž'?cbnYfhY'i bX'UbXYfY'JYfUbghU`hi b[Yb'ghUhhž'X]YX]Y'\]ghcf]gW\Yb'A Ui Yfb'ni a '@YVYb'Yfk YW_Yb'i bX'Y]bY'6fØW_Y j cb'XYf'JYf[Ub[Yb\Y]h'ni f'; Y[Ybk Ufh'gW\`U[Yb"

NY]hdYf]cXY	9fY][b]g
%' "`划\f\i bXYfh	9fVUiib[XYf 6if[XifWX X]Y
	; fUZYb'j cb' <y]xyb\y]a< th=""></y]xyb\y]a<>
%) "`划\f\i bXYfh	la VUi hYbʻi bXʻ9fk Y]hYfi b[Yb
	Ui Z[fi bX ghfUhY[]gWXYf
	Bchk YbX][_Y]hYb
%- "`划\f\i bXYfh	HY]`k Y]gY`NYfghÒfi b['i bX
	J YfZU``
## ## ## ## ## ## ## ## ## ## ## ## ##	FY_cbghfi_h]cbYb'ibX
	9f\U`hi b[ga U»bU\a Yb

9]b '6Ygi W\ 'XYf'GW\ `cggfi]bY']gh'b]W\ h'bi f'Y]bY'NY]hfY]gY']b 'X]Y

J Yf[Ub[Yb\Y]hž'gcbXYfb 'Ui W\ 'Y]bY'A Ò[`]W_Y]hž'X]Y

ZUgn]b]YfYbXYb'; YgW\]W\ hYb 'XYf'FY[]cb'ni 'YbhXYW_Yb'''K i gghYgh

Xi ž'XUgg'X]Y'6i f[']a '@Ui ZY'XYf'NY]h'Ui W\ 'U`g': `i W\ hcfh'ZØf

6Øf[Yf'X]YbhYbž'X]Y'g]W\ 'j cf'; YZU\fYb'gW\ ØhnYb'a i gghYb3'Gc`W\Y; YgW\]W\ hYb'a UW\Yb'X]Y'Fi]bY'ni 'Y]bYa '`YVYbX][Yb
; YgW\]W\ hqYf`YVb]q"

Y]bY'XYf': Ø\fi b[Yb']b'5bgdfi W\'bY\a Ybž'X]Y'j cb'`c_U`Yb <]ghcf]_Yfb'Ub[YVchYb'k YfXYb"'8]YgY': Ø\fi b[Yb'[YVYb'h]YZYfY 9]bV`]W_Y']b'X]Y'5fW\]hY_hi fž'X]Y'6YXYi hi b['XYf'6i f['i bX'X]Y A YbgW\Ybž'X]Y'Xcfh'`YVhYb'i bX'UfVY]hYhYb"'6Ygi W\Yf'g]bX'cZh VY[Y]ghYfh'j cb'XYb'`YV\UZhYb'9fnÀ\`i b[Ybž'X]Y'X]Y JYf[Ub[Yb\Y]h'k]YXYf'ni a '@YVYb'Yfk YW_Yb"

9]bY'k Y]hYfY'gdUbbYbXY': UWYhhY'XYf'GWX`cggfi]bY']gh'X]Y': `cfU i bX': Ui bU'XYf'I a [YVi b["'8]Y'< \emptyset [Y`'fi bX'i a 'X]Y'6i f['g]bX'Y]b VY`]YVhYf'Cfh'Z \emptyset f'K UbXYfYf'i bX'BUhi f`]YV\UVYf"'K U`Xk Y[Y Z \emptyset \fYb'Xi fWX'X]Y'k i bXYfgWX ÒbY'@UbXgWX UZhž'X]Y'a]h'K]`XV`i a Yb i bX'j YfgWX]YXYbYb'6Ui a UfhYb'[YgWX a \emptyset W_h']gh"'<]Yf'_Ubb'a Ub X]Y'BUhi f']b'j c``Yb'N \emptyset [Yb'[Yb]YYb"

8]Y'GWX`cggfi]bY'<Y]XYb\Y]a ']gh'gca]h'b]WXh'bi f'Y]b UfWX]hY_hcb]gWXYg'9fVYž'gcbXYfb'Ui WX'Y]b'Cfh'j c``Yf'@YVYb'i bX 9f`YVb]ggY"'GY]'Yg'VY]a '9f_i bXYb'XYf'U`hYb'A Ui Yfbž'XYf HY]`bU\a Y'Ub'Y]bYa '9j Ybh'cXYf'Y]bZUWX'bi f'VY]a '; Yb]Y»Yb'XYf 5i gg]WXh' 'X]Y'Fi]bY'k UfhYh'XUfUi Zž'YbhXYW_h'ni 'k YfXYb"

BUhi fYf`YVb]ggY`]a `I a _fY]g`j cb < Y]XYb\Y]a

<Y]XYb\Y]a 'Ub'XYf'6fYbn']gh'b]W\h'bi f'ZØf'gY]bY'\]ghcf]gW\Y
5`hghUXh'i bX'XUg']a dcgUbhY'GW\`cgg'VY_Ubbhž'gcbXYfb'Ui W\'ZØf
gY]bY'UhYa VYfUi VYbXY'BUhi f'i bX'X]Y'nU\`fY]W\Yb'A Ò[`]W_Y]hYbž
X]Y'I a [YVi b['U_h]j 'ni 'Yf_i bXYb"'J ca 'gUbZhYb': `i gg`Ui Z'XYf
6fYbn'V]g'\]b'ni 'Ui g[YXY\bhYb'K À`XYfb'i bX'<Ø[Y`bž'X]Y'X]Y
FY[]cb'dfÀ[Ybž'[]Vh'Yg'i bnÀ\`][Y'A Ò[`]W_Y]hYbž'X]Y'GW\Òb\Y]h
XYf'BUhi f'ni 'Yf`YVYb"</pre>

- GWX k UfnYf'; fUh. '9]b'\cWX[Y`Y[YbYf'5igg]WXhgdib_h'a]h 6`]W_'Ui Z'X]Y'GhUXh'i bX'X]Y'i a `]Y[YbXYb'K À`XYf"
- 6fYbnhU`k UbXYfk Y[.'9]b'UVk YWkg`i b[gfY]WkYf'K Y[Ybh`Ub['XYf'6fYbn'a]h'G][\hgYY]b[!A O[']Wk_Y]hYb"
- < Yi VYf['Fi bXk Y[.'9]b'ZUa]`]YbZfYi bX`]W\Yf'Fi bXk Y[ž]XYU`'ZØf'Y]bYb'_i fnYb'5i gZi [g!HU["

K Yf'X]Y'B Uhi f'[YfbY'j ca 'K UggYf'Ui g'Yf`YVYb'a ÒW\hYž\Uh'X]Y
A Ò[`]W_Y]hž'X]Y'6fYbn'a]h'Y]bYa '? Ubi 'cXYf'? U'U_'ni 'Yf_i bXYb"
J YfgW\]YXYbY'J Yfa]Yhi b[Yb'V]YhYb'Hci fYb'Ubž'VY]'XYbYb'a Ub
X]Y'FY[]cb'Ui g'Y]bYf'UbXYfYb'DYfgdY_h]j Y'VYhfUW\hYb'_Ubb"'8]Y
fi \][Yb'; Yk ÀggYf'g]bX']XYU`'ZØf'5bZÀb[Yf'i bX': Ua]`]Yb"

GdUn]Yf[Ab[YibX9bhgdUbbib[]bXYbDUf_g

± √ Y]XYb\Y]a 'gY`Vgh'[]Vh'Yg'a Y\fYfY'gW\ÒbY'DUf_gž'X]Y'g]W\\Yfj cffU[YbX'ZØf'YbhgdUbbhY'GdUn]Yf[Àb[Y'cXYf'Y]b'D]W_b]W_\Y][bYb"'8Yf'GhUXh[UfhYb']gh'VYgcbXYfg'VY`]YVh"'9f'VYgh]W\hXi fW\'gY]bY'[YdZY[hYb'; fØbZÀW\Ybž'V`Ø\YbXYb'6`i a YbVYYhYi bX'gW\UhhYbgdYbXYbXYb'6Ài a Y"'<]Yf'_ÒbbYb'G]Y'j ca GhUXh`YVYb'UVgW\U`hYb'i bX'X]Y'BUhi f'[Yb]Y»Yb"

- GhUXh[UfhYb. DYfZY_hZØfYbhgdUbbhYBUW\a]hhU[YibX_`Y]bY'9iYbhg"
- : f]YXYbgdUf_. '9]b'fi \][Yf'Cfh'ZØf'AYX]hUh]cb'cXYf'Y]b [ihYq'6iWX"

$FUXZU\fYb$ i bX 5i gZi [gn]Y`Y

9]bY'k Y]hYfY'A Ò[`]W_Y]hž'X]Y'l a [YVi b['j cb'<Y]XYb\Y]a 'ni Yf_i bXYbž']gh'XUg'F UXZU\fYb'''<]Yf'[]Vh'Yg'j]Y`Y'[i h

Ui g[YgWk]`XYfhY`FUXkY[YžX]Y`Xi fWk`X]Y`fY]nj c``Y`@UbXgWkUZh`XYf FY[]cb`ZØ\fYb"'Jca `KY[`XYf`K ÀggYfž`XYf`Ybh`Ub[`XYf`6fYbn j Yf`Ài Zhž`V]g`\]b`ni `Ubgdfi Wkgj c``YfYb`A ci bhU]bV]_Y!GhfYW_Yb`]a I a `UbX` `ZØf`YXYb`; YgWka UW_`]gh`Yhk Ug`XUVY]"

6Y`]YVhY': U\ffUXUi qZi [qn]Y`Y'q]bX.

- 8]Y'K UggYfVi f[.'9]b'a U`Yf]gW\Yg'N]Y`ž'XUg'g]W\\Yfj cffU[YbX'ZØf'Y]bY'_`Y]bY'F Ugh'Y][bYh"
- 6i f[ghU```Fi]bY. ?ca V]b]YfYb'G]Y'≒fY'FUXhci f'a]h
 Y]bYa '5VghYWXYf'ni f'Fi]bY'i bX'[Yb]Y»Yb'G]Y'X]Y
 5i gg]WXh"

$6 \text{ YgcbXYf} Y]hYb i b X gU]gcbU Y 5_h]j]hAhYb$

 \exists `K]bhYf'j Yfk UbXY`b'g]W\ X]Y'< Ø[Y``XYf'l a [YVi b[']b'Y]b' GW\ bYYgd]Y`d`Uhnž'k c': Ua]`]Yb'GW\`]hhYb'ZU\fYbž'G_]ZU\fYb'cXYf Y]bZUW\ [Ya Øh`]W\ Y'GdUn]Yf[Àb[Y'Xi fW\ X]Y'gW\ bYYVYXYW_hY @UbXgW\ UZh'[Yb]Y\ Yb'_ObbYb"

8]Y j]Y`gWX]WX h][Y`B Uhi f`Ub XgWX UZh`fi b X`i a `< Y]XYb\Y]a `Ub`XYf 6fYbn`V]YhYh`ZØf`YXYb`Yhk Ug` `gY]`Yg`VY]a `K Ub XYfbž`F UXZU\fYb c XYf`Y]b ZUWX `bi f`VY]a `9b hgd Ub b Yb`]b`Y]bYa `XYf`gWX ObYb`DUf_g" 9g`]gh`Y]bY`FY[]c bž`X]Y`XUni `Y]b`ÀXhž`U_h]j `ni `gY]b`i b X`X]Y`GYY`Y VUi a Y`b`ni ``UggYb"`Bi hnYb`G]Y`X]Y`; Y`Y[Yb\Y]h`i b X`YbhXYW_Yb G]Y`X]Y`B Uhi fYf`YVb]qqYž`X]Y`< Y]XYb\Y]a `ni `V]YhYb`\Uh°

?i`]bUf]gW\Y'9bhXYW_i b[Yb.'K c'a Ub'[i h YggYb'_Ubb <Y]XYb\Y]a 'Ub'XYf'6fYbn'V]YhYh'Y]bY'UVk YWkg`i b[gfY]WkY
?i `]bUf]_ž'X]Y'gck c\`'hfUX]h]cbY``Y'gWkk ÀV]gWkY'; Yf]WkhY'U`g'Ui Wk
]bhYfbUh]cbU`Y'GdYn]U`]hÀhYb'i a ZUggh"'Jcb'i f][Yb'; Ugh\Ài gYfb'V]g
\]b'ni 'a cXYfbYb'FYghUi fUbhgž'\]Yf'[]Vh'Yg'ZØf'YXYb'; Ui a Yb
Yhk Ug'ni 'YbhXYW_Yb"'@UggYb'G]Y'i bg'Y]b][Y'XYf'VYghYb
[Ughfcbca]gWkYb'5XfYggYb']b'<Y]XYb\Y]a 'Yf_i bXYb"</pre>

HfUX]h]cbY``Y`GW\kÀV]gW\Y`?ØW\Y

- ; Ugh\ Ui gʻni fʻ@]bXY. '9]b 'VY`]YVhYgʻN]Y` 'ZØf 9]b\Y]a]gW\Yž'VY_Ubbh' 'ZØf'gY]bY'A Ui `hUgW\Yb'i bX GdÀhn`Y"'8 Ugʻ[Ya Øh`]W\Y'5a V]YbhY'`ÀXhini a 'JYfk Y]`Yb Y]b"
- GW k UVYbghi VY. '<]Yf'k]fX'X]Y'hfUX]h]cbY``Y'? ØW Y'a]h gU]gcbU`Yb'Ni hUhYb'ni VYfY]hYh"'8 Ug'Nk]YVY`fcghVfUhYb']gh Y]b'DZ`]W hVYqi W °
- 5 `hY 'Dcgh. '9]b 'W Ufa UbhYg F YghUi fUbh'a]h 'hfUX]h]cbY ``Yb gW k ÀV]gW Yb'; Yf]W hYb'i bX'Y]bYa 'gW ÒbYb'6]Yf[UfhYbž]XYU`'ZØf'k Ufa Y'Gca a YfUVYbXY"

#bhYfbUh]cbU`Y`5_nYbhY

 $BYVYb `gWX k \ AV]gWX Yb `GdYn]U`]hAhYb `\ Uh' < Y]XYb \ Y]a ``Ui \ WX \\]bhYfbUh]cbU`Y `? ØWX Y `ni ``V]YhYbž`X]Y `X]Y `J]Y `ZU`h`XYf`GhUXh \\ k]XYfgd]Y[Y`h" `9]b][Y `VYa Yf_Ybgk YfhY `CfhY `g]bX.$

- @U'HfUhhcf]U. '9]b']hU`]Yb]gWXYg'FYghUi fUbhž'XUg'ZØf'gY]bYZf]gWXYb'DUghU'i bX'D]nnYb'VY_Ubbh']gh"'8]Y'[Ya Øh`]WXYb
 bYbfÀi a Y'V]YhYb'Y]b']hU`]Yb]gWXYg': `U]f"
- H\U]'6]ghfc.: Øf'@]YV\UVYf'XYf'Ug]Uh]gW\Yb'? ØW\Y']gh
 X]Yg'XYf'dYfZY_hY'Cfhž'i a 'Ui h\Ybh]gW\Y'h\U]'ÀbX]gW\Y
 ; Yf]W\hY'ni '[Yb]Y» Yb"'8]Y'Zf]gW\Yb'? fÀi hYf'i bX'; Yk ØfnY
 gcf[Yb'ZØf'Y]b'i bj Yf['Y]W\`]W\Yg'; YgW\a UW_gYf`YVb]g"
- 7 UgU 'XY` 'J]bc. '9bhXYW_Yb 'G]Y 'gdUb]gWXY 'HUdUg'i bX Yf`YgYbY 'K Y]bY ']bYa 'gh]`j c``Yb '5a V]YbhY ' 'dYfZY_h'ZØf

Y]bYb'5VYbX'a]h': fYi bXYb"

6YgcbXYfY '9f`YVb]ggY

<Y]XYb\Y]a '\Uh'Ui W\'Y]b][Y'Y]bn][Ufh][Y'[Ughfcbca]gW\Y
9f`YVb]ggY'ni 'V]YhYb.</pre>

 $\begin{tabular}{ll} $(X,Y) = (X,Y) = (X,Y)$

'6fUi YfY]Yb.'<Y]XYb\Y]a '\Uh'Y]bY'`Ub[Y'6fUi hfUX]h]cb"'9g``c\bh g]W\ž'Y]bY'XYf'cfhgUbg\Agg][Yb'6fUi YfY]Yb'ni 'VYgi W\Ybž'i a 'X]Y fY[]cbU`Yb'6]YfgcfhYb'ni 'dfcV]YfYb'i bX'a Y\f'ØVYf'XYb 6fUi dfcnYgg'ni 'YfZU\fYb"8]Y'6fUi a Ubi ZU_hi f'<Y]XYb\Y]a 'V]YhYh : Ø\fi b[Yb'i bX'J Yf_cghi b[Yb'Ub"

7 UZÅgʻi bXʻ?cbX]hcfY]Yb

BUWX 'Y]bYa ``Ub[Yb`HU['j c``Yf'9f_i bXi b[Yb`_ObbYb`G]Y`]b`Y]bYa XYf'j]Y`Yb`7UZÅg`YbhqdUbbYb.

- ? cbZ]gYf]Y'< Y]XYb\Y]a . '6YfØ\a h'ZØf']\fY'`YW_YfYb HcfhYb'i bX'?i W\Ybž']gh'X]Yg'XYf'dYfZY_hY'Cfh'ZØf'Y]bYb gØ» Yb'GbUW_cXYf'Y]bYb'?UZZYY_`UhgW\"
- 7 UZÅ '6 `i a . '9]b 'VY`]Y V hY f 'HfY ZZdi b_h']a 'GhUX hnY b hfi a
 a]h'Y]bYf'[fc» Yb '5i gk U\`'Ub': fØ\ghØW_gcdh]cbYb'i bX
 \Ui g[Ya UWX hYb'6UW_k UfYb"

 $H]YfZfYibX`]WXY`@c_U`Y$

 $\begin{tabular}{ll} K Ybb `G]Y `a]h' &= fYa `<i bX'i bhYfk Y[g'g]bXž'[]Vh'Yg'Ui Whith the constant of the$

9]b VYgcbXYfYg 9fYVb]g $g]bX X]Y gU]gcbUYb A Af_hYž X]Y [Ubn'A\f][']b < Y]XYb\Y]a <math>ghUhhZ$ bXYb.

pJ YfUbghU`hi b['p'NY]hdi b_h'p'6YgWkfY]Vi b['p

p p p

pK Y]\bUWkhga Uf_h'p'8YnYa VYf'p'@c_U`Y'?Ògh`]Wk_Y]hYb'i bX

; `Ø\k Y]b'p

p'GWk k ÀV]gWkYf'; Ybi gga Uf_h'p'A U]'p'FY[]cbU`Y'GdYn]U`]hÀhYb'i bX

<UbXk Yf_'p

p'6Ui Yfba Uf_h'p'*XYYb'GUa ghU['p': f]gWkY'DfcXi _hY'j cb'`c_U`Yb

6Ui Yfb'p

?i`hi fY``Y'<][\`][\hg.': YghY'i bX J YfUbghU`hi b[Yb'XUg'[UbnY'\\f'ØVYf</pre>

<Y]XYb\Y]a 'Ub'XYf'6fYbn']gh'b]W\h'bi f'ZØf'gY]bY'\]ghcf]gW\
VYXYi hYbXY'5`hghUXh'i bX'X]Y'VYY]bXfi W_YbXY'GW\`cggfi]bY
VY_Ubbhz'gcbXYfb'Ui W\'ZØf'gY]bY'`YVYbX][Y'?i `hi fgnYbY"'8 Ug
[UbnY'\\\f'\ØVYf'Z]bXYb']b'XYf'GhUXh'Y]bY'J]Y`nU\`'j cb': YghYb'i bX
JYfUbghU'hi b[Yb'ghUhhz'X]Y'gck c\`'9]b\Y]a]gW\Y'U`g'Ui W\
6Ygi W\Yf'Ubn]Y\Yb"'<]Yf'g]bX'Y]b][Y'XYf'_i `hi fY``Yb'<][\`][\hgz
X]Y'G]Y'VY]'Y]bYa '6Ygi W\'b]W\h'j YfdUggYb'gc``hYb.</pre>

 $%" < Y]XYb \setminus Y]a Yf Jc _gZYgh$

8 Ug' < Y]XYb\Y]a Yf'J c`_gZYghž'XUg'bcfa U`Yfk Y]gY']a 'GYdhYa VYf ghUhhZ]bXYhž']gh'Y]bYg'XYf'[fÒ» hYb': YghY']b'XYf'FY[]cb"'A]h'Y]bYa Vi bhYb'5b[YVch'Ub': U\f[YgW\ÀZhYbž': YghnY`hYb'i bX _i`]bUf]gW\Yb'@YW_YfY]Yb'n]Y\h'Yg'hUi gYbXY'j cb'6Ygi W\Yfb']b'X]Y GhUXh"'BYVYb'hfUX]h]cbY``Yb'; Yf]W\hYb'k]Y'GW\k\ÀV]gW\Y A Ui `hUgW\Yb'i bX'6fUhk i fgh'[]Vh'Yg'Ui W\'`c_U`Y'6]YfY'i bX K Y]bY'ni '_cqhYb"

&" CdYb!5]f!?cbnYfhY]a GWX `cggdUf_

' " K Y]\ b U W\ hga Uf_h

8 Yf' < Y]XYb\Y]a Yf'K Y]\bUW\hga Uf_hž'XYf']b'XYf'5Xj YbhgnY]h ghUhhZ]bXYhž']gh'Y]b'k Y]hYfYg' <][\`][\h'XYf'GhUXh'' 8 Yf'A Uf_h'V]YhYh Y]bY'ZYgh`]W\Y'5 ha cgd\ÀfY'a]h'@]W\hYfbž'A i g]_'i bX'Y]bYf'J]Y`nU\`j cb'GhÀbXYbž'X]Y'U``Yg'j cb'\UbX[YZYfh][hYb'; YgW\Yb_Yb'V]g'\]b ni '`YW_YfYa'; `Ø\kY]b'i bX'[YVfUbbhYb'A UbXY`b'j Yf_Ui ZYb''9]bY ł 6YgcbXYf\Y]h']gh'XYf'\]ghcf]gW\Y'6U\b\cZgj cfd`Uhnž'XYf'U`g gh]a a i b[gj c``Y'?i`]ggY'X]Ybh''

("'H\YUhYfj cfghY``i b[Yb'i bX'?cbnYfhY']a GhUXhh\YUhYf

8 UgʻGhUXhh\YUhYfʻ<Y]XYb\Y]a 'V]YhYhʻXUgʻ[UbnYʻ\J\\fʻØVYfʻY]b
UVk YWXgʻi b[gfY]WXYgʻDfc[fUa a 'Ubʻ5i ZZØ\fi b[YbžʻXUfi bhYf
H\YUhYfžʻCdYfʻi bXʻj YfgWX]YXYbYʻ?cbnYfhY"'8]Yʻ]bh]a Y
5 ha cgd\ÀfYʻXYgʻH\YUhYfgʻ`ÀXhʻXUni 'Y]bžʻhU`Ybh]YfhYʻ?Øbgh`Yf
\Ui hbU\`ni 'Yf`YVYb"'9]bV`]W_Yʻ]bʻX]YʻfY[]cbU`Yʻi bXʻbUh]cbU`Y
H\YUhYf_i bgh'a UWXYbʻXYbʻ6Yqi WX'ni 'Y]bYa '_i `hi fY``Ybʻ9f`YVb]q"

$) " < Y | X Y b \setminus Y | a ? i b g h b U W h$

9]b 'VYgcbXYfYg'9j Ybhž'XUg'?i bgh`]YV\UVYf'VY[Y]ghYfhž']gh'X]Y <Y]XYb\Y]a Yf'?i bghbUW\hž'X]Y'Y]ba U`'A\f`]W\'ghUhhZ]bXYh" K A\fYbX'X]YgYf'BUW\h'ÒZZbYb'nU\`fY]W\Y'; U`Yf]Ybž'5hY`]Yfg'i bX?i `hi fghAhhYb']\fY'HØfYb'i bX'dfAgYbh]YfYb'U_hi Y``Y'5i gghY``i b[Ybgck]Y'@jjY!DYfZcfa UbWyg"'8]Y'GhUXh'k]fX'ni a 'GW\Ui d`Uhn'ZØf_fYUh]j Y'9bhZU`hi b[ži bX'a Ub'gc``hY'g]W\'X]Y'7\UbWY'b]W\h

* "Gdcfhi bX 6Yk Y[i b[. < Y]XYb\Y]a Yf GdcfhZYgh

GdcfhVY[Y]ghYfhY 'gc``hYb 'XUg' < Y]XYb\Y]a Yf 'GdcfhZYgh'b]W\h
j YfdUggYbž XUg'cZh']a :: fØ\`]b['cXYf'Gca a Yf'Ui g[YhfU[Yb'k]fX"
J YfgW\]YXYbY 'gdcfh`]W\Y'8]gn]d`]bYb'k YfXYb 'gck c\``Ui Z'5a UhYi f!
U`g'Ui W\'Ui Z'DfcZ]!B]j YUi 'dfÀgYbh]Yfh" '9g']gh'Y]bY'[fc»Ufh][Y
; Y`Y[Yb\Y]hž'X]Y'`c_U`Y'Gdcfh[Ya Y]bgW\UZh'ni 'i bhYfghØhnYb'i bX
g]W\'gY`Vgh'Ub'j YfgW\]YXYbYb'5_h]j]hÀhYb'ni 'VYhY]`][Yb"

JYfUbghU`hi b[g_U`YbXYf

 $\label{thm:continuous} I a `_Y]bY`JYfUbghU`hi b[`]b`< Y]XYb`Y]a `ni `j YfdUggYbž``c\bh`Yg g]W\žY]bYb`6`]W_`]b`XYb`cZZ]n]Y``Yb`JYfUbghU`hi b[g_U`YbXYf`XYf GhUXh`ni `k YfZYb"`8 cfh`Z]bXYb`G]Y`\daggYbZcfa Uh]cbYb`\@VYf`X]Y bÀW\ghYb`: YghYž'A Àf_hYž'? cbnYfhY`i bX`H\YUhYfUi ZZ\fi b[Yb"$

AcbUh	JYfUbghU`hib[Cfh
GYdhYa VYf	<y]xyb\y]a td="" yf<=""><td>GhUXhnYbhfi a</td></y]xyb\y]a>	GhUXhnYbhfi a
	J c`_gZYgh	
Gca a Yf	CdYb!5]f!?cbnYfhY	GWX`cggdUf_
8YnYa VYf	K Y]\bUW\hga Uf_h	6U\b\cZgjcfd`Uhn
À\f`]W	?ibghbUW\h	JYfgWX]YXYbY
		; U`Yf]Yb
:fØ\`]b[#GcaaYf	GdcfhZYgh	Gdcfh[Y`ÀbXY

; $Ubn'[`Y]WX Z'cV'G]Y'_i`]bUf]gWXY'? Ogh`]WX_Y]hYb'dfcV]YfYbZ'g]WX j cb'Y]bYf'H\YUhYfUi ZZØ\fi b[']bgd]f]YfYb'`UggYb'cXYf'Y]bZUWX'bi f a]h': fYi bXYb'XUg'<Y]XYb\Y]a Yf'J c`_gZYgh'[Yb]Y<math>^{\circ}$ Yb'a OWXhYbZ

 $X]Y`GhUXh`V]YhYh`XUg`[UbnY`JU\f`ØVYf`_i`hi fY``Y`9f`YVb]ggYž`X]Y i bj Yf[Ygg`]W\Y`9f]bbYfi b[Yb`gW\UZZYb"`<Y]XYb\Y]a `]gh`Y]b`Cfhž Ub`XYa `HfUX]h]cb`i bX`?i`hi f``YVYbX][`k YfXYb`i bX`^XXYf`6Ygi W\ni `Y]bYf`Ui »Yf[Yk <math>O\b`$]W\Yb`9bhXYW_i b[`k]fX°

H]ddg ZØf Y]b Yb i bj Yf[Ygg`]W\ Yb 5i ZYbh\ U`h]b < Y]X Yb \ Y]a

<Y]XYb\Y]a 'Ub'XYf'6fYbn']gh'Y]bY'a U`Yf]gWXY'GhUXh']a '<YfnYb
j cb'6UXYb!K ØfhhYa VYf[ž'X]Y'ZØf']\fY'fY]WXY'; YgWX]WXhYž']\fY
VYY]bXfi W_YbXY'BUhi f'i bX']\fY'`YVYbX][Y'?i `hi f'VY_Ubbh']gh"
8Ua]h'=\f'5i ZYbh\U`h']b'X]YgYf'WXUfa UbhYb'GhUXh'i bj Yf[Ygg`]WX
k]fXž\UVYb'k]f'\]Yf'Y]b][Y'bØhn`]WXY'H]ddg'ni gUa a Yb[YghY``h"</pre>

%" I b h Y f_i b Zhga Ò[`]W Y]h Y b

- < c hY `'GW\ `c gg\ c hY `' '9]b 'Y `Y [Ub hY g' < c hY `'X]fY_h'Ub 'XY f GW\ `c ggfi]b Y ž']XYU`'ZØf'\]ghc f]gW\ Y '@]YV\UVY f"
- B < '< Y]XYb\Y]a ' 'A cXYfbYg'?ca Zcfh'a]h'ZUbhUgh]gWXYa
 6`]W_'Ui Z'X]Y'I a [YVi b["
- : Yf]Ybk c\bi b[Yb' : Øf'Y]bYb'dYfgÒb`]W\Yb'Hci W\Ž k À\`Yb'G]Y'Y]bY'XYf'[Ya Øh`]W\Yb': Yf]Ybk c\bi b[Yb']b XYf'5`hghUXh"

&": cfhVYk Y[ib[]b XYf GhUXh

<Y]XYb\Y]a ``Agghig]W\`Ua `VYghYb`ni :: i » `Yf_i bXYb"`J]Y`Y
GY\Ybgk ØfX][_Y]hYbž'k]Y`X]Y`5`hghUXh'i bX`X]Y`GW\`cggfi]bYž'g]bX
[i h'ni :: i » `YffY]W\VUf": Øf``Ab[YfY`5i gZØ[Y`cXYf'Y]bYb`6Ygi W\`]b
XYb`i a `]Y[YbXYb`BUhi fgW\i hn[YV]YhYb`g]bX`Ui W\`: U\ff\AXYf`Y]bY
hc``Y`Cdh]cb"`J YfgW\]YXYbY`J Yf`Y]\ghUh]cbYb`]a `GhUXhnYbhfi a
V]YhYb`dfU_h]gW\Y`@Y]\ZU\ff\AXYf`Ub"</pre>

$""8 Yf"VYghY"FY]gYnY]hdib_h$

8]Y']XYU`Y'FY]gYnY]h'ZØf'<Y]XYb\Y]a ']gh'XYf': fØ\`]b['fbdf]`'V]g

\$ b]E'i bX'XYf'<YfVgh'fGYdhYa VYf'V]g'C_hcVYfE'''Ni 'X]YgYb

\$J\fYgnY]hYb'g]bX'X]Y'HYa dYfUhi fYb'a]`Xž'i bX'X]Y'GhUXh'YfV`Ø\h

$("'9]bhUi W Yb']b'X]Y'`c_U`Y'?i`hif$

I a 'X]Y'?i `hi fgnYbY'<Y]XYb\Y]a g'VYggYf'_YbbYbni `YfbYbž
VYgi WXYb'G]Y'j YfgWX]YXYbY'A i gYYb'i bX'; U`Yf]Ybž'XUfi bhYf'XUg'
GhUXha i gYi a '<Y]XYb\Y]a "'<]Yf'YfZU\fYb'G]Y'U``Yg'ØVYf'X]Y
; YgWX]WXhY'XYf'FY[]cb'i bX'_ÒbbYb'gdUbbYbXY'5i gghY``i b[Yb
VYk i bXYfb"'5i WX'X]Y'`Ui gWX][Yb'7UZÅg'i bX'_`Y]bYb'6ci h]ei Yb']b
XYf'5`hghUXh'g]bX'Y]b'6Ygi WX'k Yfh'i bX'V]YhYb'Y]bYb'9]bV`]W_']b
XUg'`c_U`Y'@YVYb"

) "H]ddg ZØf X]Y; Ughfcbca]Y

 $8]Y'_i `]bUf]gWXY'GnYbY'< Y]XYb Y]a g']gh'j]Y`ZÀ`h]["'<]Yf'Y]b][YFYghUi fUbhgž'X]Y'G]Y'b]WXh'j YfdUggYb'gc``hYb.$

- K]fhg\Ui g`ni f`Dcgh` 'HfUX]h]cbY``Yž'gW\k ÀV]gW\Y'?ØW\Y
 a]h'\Yfn\UZhYb'; Yf]W\hYb"
- FYghUi fUbh'6`Ui Yf'< YWkh' '6Y`]YVh'ZØf'Zf]gWkYž gU]gcbU`Y'GdY]gYb']b'a cXYfbYa '5a V]YbhY"
- 7 UZÅ 'Ua 'A Uf_h' '8]Y 'dYfZY_hY '5b`Ui ZghY``Y 'ZØf'Y]bYb [Ya Øh`]W\Yb'? UZZYYdUi gY"

*": fY]nY]hU_h]j]hÀhYb ZØf ^YXYb ; YgW a UW_

9[U`ž'cV'G]Y'?i `hi fž'BUhi f'cXYf'Gdcfh'VYj cfni [Ybž'< Y]XYb\Y]a \Uh'ZØf'YXYb'Yhk Ug'ni 'V]YhYb'''<]Yf'g]bX'Y]b][Y'5_h]j]hÀhYbž'X]Y G]Y']b'\\\frac{1}{2}fYbh\U`h'Y]bd`UbYb'_\ObbhYb.

- 6Ygi WXYb'G]Y'X]Y'U`hYb'6i f[fi]bYb'i bX'[Yb]Y» Yb'G]Y'XYb DUbcfUa U!5i qV`]W_'ØVYf'X]Y'GhUXh"
- A UWXYb'G]Y'Y]bYb'5i gZi [']bg'bU\Y[Y`Y[YbY'6fYbnhU`ž Y]b'k i bXYfgWX ObYf'BUhi fdUf_'ZØf'K UbXYfYf'i bX FUXZU\fYf"
- $\bullet : \varnothing f : Ua]`]Yb. `8Yf `K]`XdUf_ `9]WXYfh `]gh `Y]b `VY`]YVh Yg$

$N]Y^*i$ a Y]bY]a]gWXY"H]YfUfhYb"ni "VYcVUWXhYb"

+ " 'J YfUbghU `hi b[Yb 'i bX ': YghY

9]b'5i ZYbh\U`h']b'<Y]XYb\Y]a ']gh'gdUbbYbXž'k Ybb'a Ub'g]W\'`c_U`Y]bVf]b[h'', VYf'XUg'\\f'j YfhY]`h'[]Vh'Yg'j YfgW\]YXYbY': YghYž'X]Ya Ub'b]W\h'j YfdUggYb'gc``hY.

JYfUbghU`hib[8 Uhi a	6YgWXfY]Vib[
<y]xyb\y]a td="" yf<=""><td>5i [i gh</td><td>9]b'hfUX]h]cbY``Yg</td></y]xyb\y]a>	5i [i gh	9]b'hfUX]h]cbY``Yg
J c`_gZYgh		: Ygh'a]h
		: U\f[YgW\ÀZhYbž
		Aig]_`ibX
		fY[]cbU`Yb
		GdYn]U`]hÀhYb"
<y]xyb\y]a td="" yf<=""><td>8YnYa VYf</td><td>9]bY[·]VYg]bb`]W\Y</td></y]xyb\y]a>	8YnYa VYf	9]bY [·] VYg]bb`]W\Y
K Y]\bUW\hga Uf_h		5ha cgd\ÀfY a]h
		j]Y`Yb
		\UbX[YZYfh][hYb
		DfcXi_hYb i bX
		@YW_YfY]Yb"

A]h'X]YgYb'H]ddg'g]bX'G]Y'VYghYbg'[YfØghYhž'i a 'Ub'X]YgYa k i bXYfj c``Yb'Cfh'XUg'6YghY'Ui g' \Rightarrow fYa '5i ZYbh\U`h'ni 'a UW\Yb" < Y]XYb\Y]a ']gh'a Y\f'U`g'bi f'Y]b'N]Y`ž'Yg']gh'Y]bY'9fZU\fi b[ž'X]YG]Y'a]h'bUW\'< Ui gY'bY\a Yb'k YfXYb"

8 Y hU]`q

6Ygi WXYb G]Y i bg Ui Z Y]bY!fY]gY "XY