

: 7A!HfUbgZYfg. GhY\h'Cha Uf'GW\cf_'j cf k Y]hYfYb'J YfdZ`]W\hi b[Yb3

BUWX 'XYa 'Dc_U`!5i gʻgi WXh': 7A !GdcfhWXYZ'Cha UfʻGWXcf_cZZYbVUfʻk Y]hYf\]b 'bUWX 'J YfghÀf_i b[Yb 'ZØf'X]Y 'A UbbgWX UZh"

8 Yf: 7 A U[XYVI f['g]Y\h'g]W\ 'Y]bYf']bhYbg]j Yb'D\UgY'Ui Z'XYa HfUbgZYfa Uf_h'[Y[YbØVYf"BUW\ XYa 'dchYbn]Y``gW\a Yfn\UZhYb 5i g']a '8: 6!Dc_U`gd]Y`'[Y[Yb'?]W_Yfg'C ZZYbVUW\ 'Ua 'A cbhU[ž'k c X]Y'A UbbgW\UZh'a]h'%\&'j Yf`cf'i bX'XUVY]'Ui Z'Y]bY'J]Y`nU\`j Yf`YhnhYf'Gd]Y`Yf'Ub[Yk]YgYb'k Ufž'ghY``h'g]W\ 'X]Y': fU[Yž'cV GdcfhW\YZ'Cha Uf'GW\cf_'U_h]j 'k YfXYb'k]fXž'i a 'Zf]gW\Y'?f\\ZhY']bg HYUa 'ni '\c`Yb"'8Yf'8fi W_'Ui Z'GW\cf_'_\ObbhY'[f\)o\ Yf'gY]b'U`g'Y ni j cfž']bgVYgcbXYfY'Ub[Yg]W\hg'XYf'Ub\U`hYbXYb JYf`Yhni b[qdfcV`Ya Uh]_']a '?UXYf"

8 Yf'%": 7 'A U[XYVi f['a i gghY'k À\fYbX'XYg'Dc_U`gd]Y`g Yfbgh\UZhY'hU_h]gW\Y'< YfUi gZcfXYfi b[Yb'VYk À`h][Yb"'9g'k Uf c ZZYbg]W\h`]W\ž'XUgg'XYf'? UXYf'nk Uf'Ui Z'XYa 'DUd]Yf'ghUf_ YfgW\Y]bhž'YXcW\']b'XYf'DfUI]g'Xi fW\'j Yf'Yhni b[gVYX]b[hY 5 i gZÀ``Y'[YgW\k ÀW\h`]gh"'GW\cf_'\Uh'V]g'ni a '' %"'5 i [i gh'X]Y A Ò[`]W_Y]hž'bYi Y'Gd]Y`Yf'ni j YfdZ]W\hYbž'i bX'Yg'gW\Y]bhž'U`g _ÒbbhY'Yf'j cb'X]YgYf'; Y`Y[Yb\Y]h; YVfUi W\'a UW\Yb"

JYf`Yhni b[gdfcV`Ya Y'i bX'?UXYfghÀf_Y

8]Y @ghY XYf j Yf YhnhYb Gd]Y Yf jgh Ub[i bX VYgcf[b]gYffY[YbX. < YfVYfh 6c W_\cfb \ Uh Y]bYb ?fYi nVUbXf]gg Yf jhhYb i bX ZÀ `h a]bXYghYbg ZØf X]Y [YgUa hY <]bfi bXY Ui g" 5i W UbXYfY GW `ØggY `gd]Y `Yf k]Y 6Uf]g 5h]_ i bX F c VYfh @Y]dYfhn _ Aa dZYb a]h J Yf Yhni b[Ybž k Ug X]Y G]hi Uh]cb ni gAhn `]W j YfgW AfZh" Ni XYa []VhYg]a a Yf k]YXYf F ØW_gW `A[Y VY] Gd]Y `Yfb k]Y @ VUa Vc

AigcbXUžXYfa]h?b]YdfcV`YaYb'_ÀadZh"`HUhgimU`±nc'ibX`HcV]Ug AØ``Yf`\UhhYb'jcf'_ifnYa'a]h'±bZY_hYb'ni'_ÀadZYbž'kÀ\fYbX D\]`]dd'<YfWXYf'YVYbZU``g'b]WXh'jYf`Yhnib[gZfY]']gh"

'8]YgY'JYf`Yhni b[Yb'nk]b[Yb'HfU]bYf'7\f]gh]Ub'H]hnž'Ui Z'k Yb][Yf
YfZU\fYbY'Gd]Y`Yf'ni fØW_ni [fY]ZYbž'k Ug'g]W\'b]W\h'Y]bZUW\'nY][h"
; YfUXY'X]Y'5i »Ybdcg]h]cbYb'g]bX'Y]b'[fc»Yg'Gcf[Yb_]bXž'XU'X]Y
bcfa U`Yfk Y]gY'VfY]hYb'Cdh]cbYb'Xi fW\']bhYfbY'JYfgYhni b[Yb'XYf
Gd]Y`Yf'D]YffY'BUX'ca VY'i bX'9`X]b'8nc[cj]W]b'X]Y'I &' 'bcW\
k Y]hYf'fYXi n]Yfh'k i fXYb"'

9]bY'k Y]hYfY'GWk UWkghY``Y'XYg'HYUa g'nY][h'g]Wk']b'XYf

\[
\display bYbj YfhY]X][i b["'\decorate Ub'\circ [cbYh'VYfY]hYhY'VY]a 'Dc_U`gd]Y`

\[
GWk]Yf][_Y]hYb'i bX'a i gghY'ni f'< U`VnY]h'Xi fWk'XYb

\[
Ub[YgWk`U[YbYb'HcV]Ug'A Ø``Yf'YfgYhnh'k YfXYb"'8]YgYf'nY][hY

\[
YVYbZU``g'_Y]bY'cdh]a U`Y': cfa 'i bX'k Uf'a U\decorate [YV`]Wk']b'XUg'nk Y]hY

\[
Y[Ybhcf']bj c`j]Yfh"'5i Wk'UbXYfY'JYfhY]X][Yf'k]Y'5bX]'<ch]

\[
k i fXY'Ui Z[fi bX'j cb'gWk UWkYb'@Y]ghi b[Yb'Ui g'XYa '?UXYf

[Ybca a Ybž'k Ug'X]Y'Gcf[Yb'i a 'X]Y'8YZYbg]j Y'j YfghAf_h"

CVk c\``GW\cf_'_Øfn`]W\']b'Y]bYa 'HY`YZcb[YgdfÀW\'a]h'G_m!?ca a YbhUhcf'GhYZUb'<Ya dY``UbXYi hYhYž'XUgg'Yf'a Ò[`]W\Yfk Y]gYbcW\a U`g'Ui Z'XYa 'HfUbgZYfa Uf_h'hÀh]['k YfXYb'_ÒbbhYž']gh'YgUVni k UfhYbž'cV'X]Yg'hUhgÀW\`]W\'[YgW\Y\Yb'k]fX"'Gd]Y`Yf'k]Y\Jgcb'7Y_U'ghY\Yb'j cf'Y]bYa 'a Ò[`]W\Yb'K YW\gY`ž'k À\fYbX'Ui W\5`YI UbXYf'Bc``YbVYf[Yf'5b[YVchY'j cb'UbXYfYb'JYfY]bYbYf\U`hYb'\UVYb'_ÒbbhY"'9g'V`Y]Vh'i b[Yk]ggž'k]Y'g]W\'X]YgY

8]Y'<YfUi gZcfXYfi b['ZØf'GW\cf_'VYghY\h'b]W\h'bi f'XUf]bž dUggYbXY'J YfghÀf_i b['ni 'Z]bXYbž'gcbXYfb'Ui W\'g]W\Yfni ghY``Ybž XUgg'X]Y'BYi Yb'bU\h`cg']bg'VYghY\YbXY'HYUa ']bhY[f]Yfh'k YfXYb_\ObbYb"'8]Y'9fZU\fi b[Yb'XYg'Dc_U`gd]Y`gž']b'XYa 'j]Y`Y'Gd]Y`Yfb]W\h']\fY'VYghY'@Y]ghi b['nY][hYbž'i bhYfghfY]W\Yb'X]Y 8f]b[`]W_Y]h'Y]bYf'?UXYfUi ZZf]gW\i b["'8Yf'8fi W_'Ui Z'GW\cf_ž gck c\`']b'gY]bYf'HfUbgZYfdc`]h]_'U`g'Ui W\']b'XYf'5i ZghY``i b[ž'k]fX ghY][Ybž']bgVYgcbXYfY']b'XYf'Ub[YgdUbbhYb'G]hi Uh]cb'j cf'XYa bÀW\ghYb'@][Ugd]Y`"

: 7A]a : c_i g XYf 5i Za Yf_gUa _Y]h

9g'k]fX'gdUbbYbX'ni 'VYcVUW\hYb'gY]bž'k]Y'XYf': 7'A U[XYVif[UiZ'X]Y'<YfUigZcfXYfib[Yb'fYU[]Yfh":8Yf'GU]gcbghUfh'kUf'V]g`Ub[XifW\kUW\gYbž'ibX'X]Y'Ub[YgW\`U[YbYb'Gd]Y`Yf'g]bX'bif'X]YGd]hnY'XYg'9]gVYf[g"'GW\cf_'VYZ]bXYh'g]W\']b'Y]bYf'Dcg]h]cbž']b'XYfghfUhY[]gW\Y'9bhgW\Y]Xib[Yb'[YhfcZZYb'kYfXYb'a ØggYbž'ia'X]YA UbbgW\UZh'kYhVYkYfVgZ\\]['ni'\U`hYb"

8]Y'VYj cfghY\YbXY'HfUbgZYfdYf]cXY'_ObbhY'Y]bY'YbhgW\Y]XYbXYFc``Y'gd]Y`Ybž'b]W\h'bi f'ZØf'X]Y'a ca YbhUbY'G]hi Uh]cb'XYg': 7A ž gcbXYfb'Ui W\'ZØf'XYggYb'Ni _i bZhgdYfgdY_h]j Yb'': Ubg'i bX6YcVUW\hYf'g]bX'[YgdUbbhž'k Y`W\Y'GW\f]hhY'GW\cf_'U`g'BÀW\ghYgi bhYfbY\a Yb'k]fX'i bX'cV'Yf'Yg'gW\UZZYb'_Ubbž'XUg'HYUa 'j cf [fÒ»YfYb'<YfUi gZcfXYfi b[Yb'ni 'VYk U\fYb''8]Y'bÀW\ghYb'HU[Y_ObbhYb'YbhgW\Y]XYbX'ZØf'X]Y'? UXYfd`Ubi b['i bX'gca]h'Ui W\'ZØf XYb'k Y]hYfYb'JYf`Ui Z'XYf'GU]gcb'gY]b''

8]Y'G]hi Uh]cb'VY]a '%": 7'A U[XYVi f[']gh'b]W h'bi f'Y]bY < YfUi gZcfXYfi b['ZØf'XUg'U_hi Y``Y'A UbU[Ya YbhžgcbXYfb'gd]Y[Y`h Ui W\'[fÒ» YfY'HfYbXg']a 'XYi hgW\Yb': i » VU```k]XYf" = a Yf'k]YXYf gY\Yb'g]W\'JYfY]bYž']bgVYgcbXYfY'gc`W\Yž'X]Y']a 'cVYfYb'8f]hhY` XYf'@][Yb'U[]YfYb'k c``Ybž'a]h'JYf`Yhni b[Yb'i bX DYfgcbU`dfcV'Ya Yb'_cbZfcbh]Yfh"'@Ui h'Y]bYf'I bhYfgi W\i b['XYg 8Yi hgW\Yb': i » VU``!6i bXYg'f8: 6Ł'g]bX'JYf`Yhni b[Yb']b'XYb 'YhnhYb'\\J\fYb'i a '%\si 'Ub[Ygh]Y[Yb\Zik Ug'X]Y'Bchk YbX][_Y]h'j cb ghfUhY[]gW\Yb'?UXYfd`Ubi b[Yb'i bhYfghfY]W\h''8]Y'Ub\U`hYbXYb DfcV'Ya Y']a '?UXYf'XYg': 7A '_ObbhYb'XU\Yf'Y]bY'VYk i gghY ghfUhY[]gW\Y'5bhk cfh'Ui Z'X]YgY'U``[Ya Y]bYb'< YfUi gZcfXYfi b[Yb gY]b"

8]Y Z]bUbn]Y``Y @U[Y Y]bYg'J YfY]bg'gd]Y`h'YVYbZU``g'Y]bY
k YgYbh`]W\Y'Fc``Y'VY]'XYf'?UXYf[YghU`hi b["'8Yf'%": 7 A U[XYVi f[\UhhY']b'XYf'`YhnhYb'GU]gcb'Y]bY'ghY][YbXY'9]bbU\a Yei Y``Y'Ui g
H]W_Yhj Yf_Ài ZYb'i bX'Gdcbgcf]b[ž'k Ug'ZØf'Y]bYb'dchYbn]Y``Yb
HfUbgZYfa Uf_h!9]bgdfi W\'j cb'GW\cf_'gdfYW\Yb'_\ObbhY"'8U'g]W\\j]Y`Y'?`i Vg']b'XYf'FY[]cbU``][U'i bX'' "'@][U']b'Y]bYf'dfY_\AfYb
Z]bUbn]Y``Yb'G]hi Uh]cb'VYZ]bXYbž'_\ObbhY'XYf': 7A '[Yn]Y`h'Gd]Y`Yf

JYf`Yhni b[gdfcV`Ya Uh]_'i bX'?UXYfXmbUa]_

 $8]Y "J Yf`Yhni b[gdfcV`Ya Uh]_ž`a]h`XYf`XYf`%": 7 "A U[XYVi f[U_hi Y```ni '_Aa dZYb`\Uhž`_ObbhY`YVYbZU``g`X]Y`Bchk YbX][_Y]h`ZØfk Y]hYfY`HfUbgZYfg`j YfghAf_Yb"`9]b`dfA[bUbhYg`6Y]gd]Y``]gh`XYf?fYi nVUbXf]gg`j cb`<YfVYfh`6c<math>W_$ \cfbž`XYf`Y]bY`GW\`ØggY`Z][i f`]bXYf`8 YZYbg]j Y`]gh"`Ghi X]Yb`nY][Ybž`XUgg`J YfY]bYž`X]YjYf`Yhni b[gUbZA``][Y`Gd]Y`Yf`\UVYbž`]b`XYf`FY[Y`ghAf_YfYFØW_[Ab[Y`]b`XYf`HYUa`Y]ghi b[`nY][Yb"`8]YgY`ghUh]gh]gW\Yb8UhYb`i bhYfghfY]W\Yb`X]Y`6YXYi hi b[`Y]bYf`Z]hhYb`i bX`Y]ghi b[gZA\][Yb`A UbbgW\UZh`ZØf`XYb`gdcfh`]W\Yb`9fZc`["

8 UfØVYf`\]bUi g`k]fX`XYf`? UXYf`XYg`: 7 A `Xi fW\`X]Y``1 b[Y I &' !A UbbgW\UZh`Yf[Àbnhž`X]Y`hU`Ybh]YfhY`Gd]Y`Yf`Ui Zk Y]ghž`UVYf a Ò[`]W\Yfk Y]gY`b]W\hij c``ghÀbX][`Ui Z`X]Y`5bZcfXYfi b[Yb`XYg DfcZ]gd]Y`VYhf]YVg`j cfVYfY]hYh`]gh"`7\f]gh]Ub`H]hn`k]fX`XU\Yf [Ynk i b[Yb`gY]bž`Y]bYb`6U`UbWYU_h`nk]gW\Yb`XYf`: ÒfXYfi b['1 b[Yf`HU`YbhY`i bX`XYa `6YXUfZ`Ub`9fZU\fi b[`]a `?UXYf`ni `Z]bXYb" 8]Y`9bhgW\Y]Xi b[ž`Gd]Y`Yf`]b`X]Y`I &' `ni `j YfgYhnYbž`_ÒbbhY`Ui Z Y]bY``Ub[Zf]gh][Y`GhfUhY[]Y`\]bk Y]gYbž`X]Y`g]W\`a Y\f`Ui Z`X]Y 9bhk]W_`i b[`U`g`Ui Z`XUg`_i fnZf]gh][Y`5VgW\bY]XYb`_cbnYbhf]Yfh"

Gd]Y`Yf	Dcg]h]cb	GhUhi g
< YfVYfh [·] 6cW_\cfb	JYfhY]X][Yf	JYf`Yhnh
		f?fYinVUbXf]ggŁ
6Uf]g [·] 5h]_	A]hhY`ZY`Xgd]Y`Yf	JYf`Yhnh
FcVYfh'@Y]dYfhn	A]hhY`ZY`Xgd]Y`Yf	JYf`Yhnh
		fbXXi_hcfYbŁ
@ VUa Vc AigcbXU	JYfhY]X][Yf	JYf`Yhnh
		f?b]YdfcV`Ya YŁ
HUhgi mUʻ≢nc	A]hhY`ZY`Xgd]Y`Yf	JYf`Yhnh
HcV]Ug'A Ø``Yf	JYfhY]X][Yf	JYf`Yhnh
$D\]`]dd'< YfW\Yf$	JYfhY]X][Yf	5b[YgWX`U[Yb

 ± 5.5 b V Y hf U W h 'X Y f 'J] Y `n U \ ` 'U b 'J Y f `Y h n i b [Y b 'i b X 'X Y b 'X U a] h

j YfVi bXYbYb'9]bVi » Yb']b'XYf'A UbbgWk UZhgei U`]hÀh'k]fX'Yg'i a gc k]Wkh][Yfž'XUgg'C ha Uf'GWkcf_'VY]a 'VYj cfghY\YbXYb HfUbgZYfZYbghYf'ghfUhY[]gWk'\UbXY`h''8]Y': fU[Y'V`Y]Vhž'cV'Yf'X]Y f]Wkh][Yb'9bhgWkY]Xi b[Yb'hf]ZZhž'i a 'XYa': 7 A 'Ui Z'XYa' K Y[ni fØW_'ni 'gdcfh`]WkYa '9fZc`['ni '\Y`ZYb"

8 Y hU]`c

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