

? UhnY ']b '7\Ya b]hn. ': Yi Yfk Y\f'fYhhYh'H]Yf Ui g'VfYbn`]WXYf'@U[Y

±0.7\Ya b]hn'k i fXY'Y]bY'? UhnY'j cb'XYf': Yi Yfk Y\f'Ui g'Y]bYf K c\bi b['[YfYhhYh"'5bk c\bYf'a Y`XYhYb'H]Yfei À`YfY]ž'U`g XUg'H]Yf']b'XYf'dfU``Yb'GcbbY'Ui g\UffhY"

±0.7\Ya b]hnž'Ua '8]YbghU[a cf[Yb'[Y[Yb'%\$"' \$1\fž'k i fXY'X]Y : Yi Yfk Y\f'ni 'Y]bYa 'i b[Yk Ò\b']WXYb'9]bgUhn'[Yfi ZYb"'5i Z'XYf 9fbgh!9b[Y!GhfU» Y'k UfhYhY'Y]bY'_`Y]bY'? UhnY'XUfUi Zž'[YfYhhYh'ni k YfXYb"'5bk c\bYf'\UhhYb'VYfY]hg'VYa Yf_hž'XUgg'XUg'H]Yf'cZh U``Y]b'Ui Z'XYa ': YbghYfVfYhh'Y]bYg'j]YfhYb'GhcW_g'gU» 'i bX'`Ui h _`U[hY"'6YgcbXYfg'VYgcf[b]gYffY[YbX'k Uf'ZØf'X]Y'BUWXVUfbž'XUgg X]Y'? UhnY']b'XYf'dfU``Yb'GcbbY'Ui g\UffYb'a i gqhY"

8]Y'G]hi Uh]cb'k i fXY']a a Yf'_f]h]gWXYfžXU'5bk c\bYf'XYb

J YfXUWXh'\UhhYbž'XUgg'X]Y'?UhnY'fY[Y`a À»]['k À\fYbX'XYf

5Vk YgYb\Y]h']\fYf'6Yg]hnYf']b'XYf'K c\bi b['ni f@W_[Y`UggYb
k i fXY"'8]Y'<]`Z`cg][_Y]h'XYg'H]YfYg'k YW_hY'XUg'A]h[YZØ\`XYf

BUWXVUfbži bX'g]Y'YbhgWX`cggYb'g]WXž'X]Y': Yi Yfk Y\f'ni
U`Ufa]YfYb"'Ni XYa 'YfghUhhYhYb'g]Y'5bnY][Y'VY]'XYf'Dc`]nY]ž'i a
Ui Z'X]Y'a Ò[`]WXY'H]Yfei À`YfY]'Ui Za Yf_gUa 'ni 'a UWXYb"'9]b

GWXf]hhž'XYf'b]WXh'bi f'X]Y'FYhhi b['XYf'?UhnYž'gcbXYfb'Ui WX
fYWXhgfYWXh']WXY'?cbgYei YbnYb'ZØf'X]Y'6Yg]hnYf'\UVYb'_ObbhY"

9]b 'H]Yf']b 'B ch

]b'XYf'dfU``Yb'GcbbY'i bX'XUg'GW\fY]Yb'i a '<]`ZY'Ài » Yfgh VY`UghYbX'ZØf'XUg'_`Y]bY'H]Yf'[Yk YgYb'gY]b'a ØggYb"

8]Y:: Yi Yfk Y\f`ZØ\fhY`X]Y`F Yhhi b[gU_h]cb`nØ[][`i bX`dfcZYgg]cbY`` Xi fW\"`A]h`[YgW\i`hYa `DYfgcbU``i bX`XYb`dUggYbXYb`K Yf_nYi [Yb [Y`Ub[`Yg`XYb`9]bgUhn_f\AZhYbž`X]Y`? UhnY`g]W\Yf`Ui g`XYf a]gg`]W\Yb`@U[Y`ni `VYZfY]Yb"`8]YgY`5fh`j cb`9]bg\AhnYb`nY][hž`k]Y k]W\h][`X]Y`5i Za Yf_gUa _Y]h`XYf`BUW\VUfb`]ghž`k Ybb`Yg`i a `XUg K c\``j cb`H]YfYb`[Y\h"

FYhhi b[ga U»bU\a Yb i bX k Y]hYfY GW f]hhY

BUWX 'XYf'YfZc`[fY]WXYb'FYhhi b['kifXY'X]Y'?UhnY'jcb'XYf
: YiYfk Y\finia 'JYhYf]bÀf'[YVfUWXh"'8Ug'JYhYf]bÀfUa h'k]fX']b
k Y]hYfYb'GWXf]hhYb'dfØZYbž'cV'X]Y'?UhnY'UiZ[fibX'XYf'IaghÀbXY
]a'<Uig\U`h'XYf'6Yg]hnYf'Ub\U`hYbXY'DfcV`YaY'\Uh"'8]YgY
h]YfÀfnh`]WXYb'AU» bU\aYb'g]bX'YbhgWXY]XYbXž'ia'ZYghnighY``Ybž
cV'XUg'H]Yf'[YgibX\Y]h`]WXY'6YY]bhfÀWXh][ib[Yb'Yf`]hhYb'\Uhž'X]Y
Uig'XYf'VYgWXfÀb_hYb'G]hiUh]cb'fYqi`h]YfYb"

 $8] Y "9fY] [b] ggY" fibX" ia "X] Y "FYHhib ["XYf"? UhnY"] b"7 \Yab] hn k YfZYb" Y] b"VYXYihYbXYg" @] Wkh" UiZ"X] Y"JYfUbHk cfhib ["XYf < Uigh] YfVYg] hnYf" ibX" X] Y"Bchk YbX] [_Y] h"XYg"H] YfgWkihnYg" '9g"] gh k] Wkh] [ž"XUgg" H] YfY" k À\fYbX" XYf" 5 Vk YgYb\Y] h"] \fYf" < U`hYf" b] Wkh |] b"XYf" K c\bib ["Y] b [YgdYffh" k YfXYbž" XU"X] Yg" nid \mg] gWkYb" ibX dgmWk] gWkYb" GWk ÀXYb" ZØ\fYb" _Ubb" "8 Yf" JcfZU```\Uh" Uh" UiWk" [YnY] [hžk] Y"k] Wkh] ["X] Y"Fc``Y" XYf" 5 bkc \bYf"] b"gc`WkYb" G] hiUh] cbYb"] ghž" XUg] Y"b] Wkh" bif" XYb" Aih`\UhhYbž" <]`ZY" niff ZYbž" gcbXYfb" UiWk" U_h] inif" FYhhib["XYg" H] YfYg" VY] [YhfU[Yb" \UVYb"$

$9]bV^{M}Y^{M}bX]Y^{M}Y^{M}bXY^{M}ihn^{M}i$

 $8]Y'JcfZA``Y'X]YgYf'5fh'g]bX``Y]XYf'_Y]bY'GY`hYb\Y]h''= a a Yf'k]YXYf _ca a h'Yg'j cfž'XUgg'H]YfY']b'K c\bi b[Yb'[Yei A`h'cXYf j YfbUW\`Agg][h'k YfXYb'''8Yf'H]YfgW\i hn']gh'Y]b'k]W\h][Yg'5b`]Y[Ybž XUg'b]W\h'bi f'Ui Z'[YgYhn`]W\Yfž'gcbXYfb'Ui W\'Ui Z [YgY``gW\UZh`]W\Yf'9VYbY'6YUW\hi b['Z]bXYb'a i gg'''5i Z_`Afi b[<math>\emptyset$ VYf'X]Y'6YX \emptyset fZb]qqY'j cb'H]YfYb'i bX'XUg'f]W\h][Y'<U`hYb'q]bX

YggYbn]Y``Y`GW\f]hhYži a `gc`W\Y`BchZ\``Y`ni `j Yf\]bXYfb"'9g``]Y[hi]bXYfJYfUbhk cfhi b[`XYf'; Ya Y]bgW\UZhžNY]W\Yb'j cbA]gg\UbX`i b[`cXYf'JYfbUW\`\Agg][i b[`Yfbgh'ni `bY\a Yb'i bXYbhgdfYW\YbX'ni `\UbXY\`b"'8Yf'j cf`]Y[YbXY': U```_\ObbhY`U`g5bghc\sin X]YbYbž'XUg'6Yk i gghgY]b`ZØf'XYb'H]YfgW\i hn'ni `gW\\\AfZYbi bX'XYb'[YgY\`gW\UZh`]W\Yb'8fi _\U'Ui Z'j YfUbhk cfhi b[gj c``Yg

<UbXY\`b']b'6Yni [`Ui Z'<Ui gh]YfY'ni `Yf\\O\Yb"

FYWXh`]WXY'FU\a YbVYX]b[ib[Yb

 $8 \ Yf: \ U```]b`7 \ Yab]hn`k]fZh`k]Wkh][Y`fYWkh`]WkY: fU[Yb`]a`6YfY]Wk XYg`H]YfgWkihnYg`UiZ'`*\delta 8 YihgWk`UbX`]gh`XYf`H]YfgWkihn`XifWk XUg`; fibX[YgYhn`ibX`XUg`H]YfgWkihn[YgYhn`[YfY[Y`h''BUWk`z`% XYg`H]YfgWkihn[YgYhnYg`\Uh`YXYf`XUg`FYWkhž`H]YfYb`Y]b Ufh[YfYWkhYg`ibX`h]YfgWkihn[YfYWkhYg`@YVYb`ni`YfaÒ[`]WkYb"`8]Y 5bnY][YžX]Y`VY]`XYf`Dc`]nY]`YfghUhhYh`kifXYž`VYhf]ZZh`aihaU»`]WkYJYfghÒ»Y`[Y[Yb`XUg`H]YfgWkihn[YgYhnž`]bgVYgcbXYfY`X]Y`<U`hib[jcb`H]YfYb`]b`ibniaihVUfYb`6YX]b[ib[Yb"$

9]b 'J Yfghc » '[Y[Yb 'X Ug 'H] Yfg W i hn[Yg Yhn '_Ubb 'f Y W h'] W Y ': c`[Yb ZØf 'X] Y '< U 'h Yf '\ UV Y b ž 'Y] bg W `] Y » `] W '; Y `Xghf U Z Yb 'c X Yf '] a g W X `] a a gh Yb ': U `` 'X Ya '9 b hni ['X Yg 'H] Yf Yg " 8 Ug 'J Yh Yf] b Àf Ua h 'k]f X]b 'g c `W Y ': À ``Y '] bj c `j] Yfh ž i a 'X Yb '; Ygi b X \ Y] hg ni gh Ub X 'X Yg 'H] Yf Yg ni 'd f Ø Z Yb 'i b X '[Y[YV Yb Yb Z U ``g 'k Y] h Yf Y 'A U » b U \ a Yb 'ni 'Yf [f Y] Z Yb " \ \dangle 'X] Yg Ya ': U `` 'k i f X Y 'X] Y '? Uhn Y 'Y] b Ya 'H] Yf Uf nh 'j c f [Ygh Y ``h ž 'k Ug Y] b Y 'Gh Ub X Uf X d f c n Y X i f 'V Y] 'g c `W Yb '9] b g Àhn Yb '] g h "

H]YfgWxi hncf[Ub]gUh]cbYb'ibX']\fY'Fc``Y

±0.7\Ya b]hnž'k]Y']b'j]Y`Yb'UbXYfYb'GhÀXhYbž'_ÒbbYb'5bk c\bYfž

X]Y 'VYgcf[h'ØVYf'XUg'K c\`Yf[Y\Yb'Y]bYg'H]YfYg'g]bXž'Ui W\'X]fY_h ?cbhU_h'ni 'X]YgYb'Cf[Ub]gUh]cbYb'Ui ZbY\a Yb"'G]Y'V]YhYb'b]W\h bi f'fYW\h`]W\Y'6YfUhi b[ž'gcbXYfb'Ui W\'dfU_h]gW\Y'<]`ZY']b': cfa j cb': i hhYfgdYbXYb'cXYf'DZY[YUb[YVchYb'ZØf'[YfYhhYhY'H]YfY"

$8 Ug K c \ XYf H]YfY]a : c_i g$

8 Yf J cfZU``nY][hžk]Y k]Wkh]['Yg']ghž Ui Z'XUg'K c\``XYf'H]YfY ni UWkhYb'i bX'gYbg]V]`]g]Yfh'X]Y; Ya Y]bgWkUZh'ZØf'H]YfgWki hnZfU[Yb" 9g'Yf]bbYfh'i bg'XUfUbž'XUgg'H]YfY']b'ghÀXh]gWkYb'l a [YVi b[Yb VYgcbXYfg'gWki hnVYXØfZh]['g]bX"'5i Wk'k Ybb'j]Y`Y'H]Yf\U`hYf j YfUbhk cfhi b[gVYk i ggh'a]h']\fYb'< Ui gh]YfYb'i a [Y\Ybž'[]Vh'Yg `Y]XYf'5i gbU\a Ybž'X]Y'Yhk Ug'a Y\f'5i Za Yf_gUa _Y]h'i bX < UbX`i b[Yb'YfZcfXYfb"

a :: U```XYf'? UhnY']b'7\Ya b]hn']gh'X]Y'gW\bY``Y'FYU_h]cb'XYf

5bk c\bYf'i bX'XYf': Yi Yfk Y\f'Y]b'dcg]h]j Yg'6Y]gd]Y``ZØf'XUg

9b[U[Ya Ybh'XYf'6Yj Ò`_Yfi b["'9g'j YfXYi h`]W\hž'XUgg'YXY'DYfgcb
]b'XYf'; Ya Y]bgW\UZh'X]Y'J YfUbhk cfhi b['\Uhž'g]W\'ZØf'XUg'K c\`
j cb'H]YfYb'Y]bni qYhnYb'i bX']a 'J YfXUW\hgZU``ni '\UbXY`b"

8 Y hU1`a

6 Y gi W Y b 'G] Y 'i b g 'U i Z 'b ! U ["X Y