

# 8 Y`a Yb\cfgh'9bhXYW\_Yb. 5`hghUXhž'B Uhi f i bX'; Ybi gg'ZØf'U``Y°

9bhXYW\_Yb'G]Y'8Y`a Yb\cfgh'j cb'XYf'\]ghcf]gW\Yb'5`hghUXh ØVYf'BUhi fYf`YVb]ggY'V]g'\]b'ni '\_i `]bUf]gW\Yb'<][\`][\hg" GdUbbi b['i bX'GdU» 'ZØf'X]Y'[UbnY': Ua]`]Y°

K ]``\_ca a Yb']b'8Y`a Yb\cfghžY]bYf'W\Ufa UbhYb'GhUXh']a '<YfnYbB]YXYfgUW\gYbgžX]Y'cZh']a 'GW\UhhYb']\fYf'[fÒ»YfYb'BUW\VUfb6fYa Yb'i bX'C`XYbVi f['ghY\hžUVYf'a Y\f'U`g'Y]bYb'6Ygi W\'k Yfh]gh''<]Yf'nfYZZYb'\]ghcf]gW\Y'Gh\hYb'Ui Z'a cXYfbY'@YVYbgUfhž'i bXX]Y'I a [YVi b['V]YhYhY]bY': Ø``Y'j cb'BUhi fYf`YVb]ggYbžX]Y gckc\``Yf\c`gUa 'U`g'Ui W\'UVYbhYi Yf`]W\'g]bX''CV'Xi 'Xi fW\'X]Y a U`Yf]gW\Y'5`hghUXh'gW\`YbXYfghž'X]Y'\_i `]bUf]gW\Yb'?\Ogh`]W\\_Y]hYbXYf'FY[]cb'[Yb]Y\nhcXYf'Ui Z'XYf'Gi W\Y'bUW\'\_i `hi fY``Yb<][\`][\hg'V]gh''8Y`a Yb\cfgh`\Uh'Z\f'YXYb'Yhk Ug'ni 'V]YhYb'''\d\bX]YgYa '5fh]\_Y``bY\a Yb'k]f'X]W\'a ]h'Ui Z'Y]bY'9bhXYW\_i b['gfY]gYXi fW\'X]Y'ZUgn]b]YfYbXYb': UWYhYb'X]YgYf'GhUXh'i bX']\fYfIa [YVi b['''@Ugg'X]W\']bgd]f]YfYb'i bX'YbhXYW\_Y'i bgYfY</p>

# 9bhXYW\_i b[ 'XYf'\]ghcf]gW\Yb'5`hghUXh'j cb 8Y`a Yb\cfgh

8 Y`a Yb\cfghž'Y]bY'GhUXh']a '6i bXYg`UbX'B]YXYfgUW\gYbž ØVYffUgW\h'j ]Y`Y'6Ygi W\Yf'a ]h']\fYf'W\Ufa UbhYb'5`hghUXhž'X]Y fY]W\'Ub'; YgW\]W\hY'i bX'\_i `hi fY``Ya '9fVY']gh"'5i Z'XYb'YfghYb 6`]W\_'a U[ '8 Y`a Yb\cfgh'b]W\h'k ]Y'Y]bY'hmd]gW\Yg'Hci f]ghYbn]Y` YfgW\Y]bYbž'UVYf'gcVU`X'a Ub'Xi fW\'X]Y'?cdZghY]bdZ'UghYfghfU» Yb gW\`YbXYfhž'k ]fX'a Ub'j ca `\]ghcf]gW\Yb'NUi VYf'i bX'XYb [ Ya Øh`]W\Yb'9W\_Yb'X]YgYf'GhUXh'[ YZYggY`h"

9]b'[i hYf'5i g[ Ub[ gdi b\_h'ZØf'XY]bY'9bhXYW\_i b[ ghci f']gh'XUg' GhUXha i gYi a '8 Y`a Yb\cfgh"'<]Yf'YfZÀ\fgh'Xi 'a Y\f'ØVYf'X]Y
9bhk ]W\_`i b[ 'XYf'GhUXh'i bX']\fYf'I a [ YVi b[ "'8 Ug'A i gYi a 'V]YhYh
Y]bY'J]Y`nU\`'j cb'5i gghY``i b[ Ybž'X]Y'X]Y'; YgW\]W\hY'j cb
8 Y`a Yb\cfgh'j cb'XYb'5bZÀb[ Yb'V]g'ni f'; Y[ Ybk Ufh'VY`Yi W\hYb"
6 YgcbXYfg'VYa Yf\_Ybgk Yfh'g]bX'X]Y'9I dcbUhY'ni f

\$\DXI ghf]Y[ YgW\]W\hY\z\X]Y'X]Y'Fc``Y'XYf'GhUXh']a 'K UW\\ghi a
B]YXYfgUW\\gYbg'j YfXYi h`]W\Yb"

K Ybb Xi Xi fW X]Y; UggYb gW YbXYfghžk ]fgh Xi Ui W X]Y 5 hY Yi Yfk Y\f YbhXYW\_Yb"8]YgYg; YVÀi XY nYi [hij cb XYf YfY][b]gfY]W Yb; YgW ]W hY XYf GhUXh i bX k i fXY `]YVYj c ``fYghUi f]Yfh" < Yi hY X]Ybh Yg U`g J YfUbghU`hi b[gcfh i bX ]gh Y]b VY`]YVhYf HfYZZdi b\_hž VYgcbXYfg VY] \_i `hi fY ``Yb '9j Ybhg" 5 W hY XUfUi Zž X]Y J YfUbghU`hi b[Yb ]a '6`]W\_ni VY\U`hYb `c Zh Z]bXYb \]Yf ]bhYfYggUbhY K cf\_g\cdg i bX 5i gghY``i b[Yb ghUhh"

9]b k Y]hYfYf]bhYfYggUbhYf'Di b\_h]gh'XYf' < c Z'j c b 'C `XYbVi f[ ž XYf'X]f'Y]bYb'9]bV`]W\_']b'X]Y'; YgWX]WXhY'XYf'; fUZYb'j c b C `XYbVi f[ '[ ]Vh''8Yf' < c Z']gh'\Yi hY'U`g'?ca d`Yl'a ]h'K c\b!'i bX; YgWXÀZhgfÀi a Yb'VY\_Ubbh'i bX'V]YhYh'nk Ub[ `cgY 5 i gZi [ ga  $O(`)WX_Y]hYb'ni '_Y]bYb'6ci h]ei Yb'i bX'7UZÅgž'X]Y']b XYb'\]ghcf]gWXYb'FÀi a Yb'i bhYf[ YVfUWXh'g]bX''$ 

6YgcbXYfg'Ya dZY\`Ybgk Yfh']gh'Y]b'GdUn]Yf[ Ub[ 'Ybh`Ub[ 'XYg' 8 Y`a Y': `i ggYg"'8]Y'l ZYfdfca YbUXY'k i fXY']b'XYb'`YhnhYb
\U\fYb'fYj ]hU`]g]Yfh'i bX'V]YhYh'Ub[ YbY\a Y'D`ÀhnY'ni a
9bhgdUbbYb"'<]Yf'\_Ubbgh'Xi 'X]Y'BUhi f'[ Yb]Y» Yb'i bX'[ `Y]W\nY]h][
Y]bYb'6`]W\_'Ui Z'Y]b][ Y'XYf'\]ghcf]gW\Yb'6fØW\_Yb'k YfZYbžX]Y'X]Y

VY]XYb'l ZYf'j YfV]bXYb"'8 Ug': `i ggi ZYf']gh'Y]b'VY`]YVhYf'C fh'ZØf 9]b\Y]a ]gW\Yž'i a 'g]W\'ni 'hfYZZYbž'i bX'Xi 'k ]fgh'a Yf\_Ybž'k Ufi a ' X]Y'5ha cgd\ÀfY']gh'Y]bZUW\'i bj Yf[ `Y]W\`]W\

## < ]ghcf]gWXY; YVÀi XYi bX 8Yb\_a À`Yf</pre>

8]Y'5`hghUXh'j cb'8Y`a Yb\cfgh']gh'[Ygd]W\_h'a]h'\]ghcf]gW\Yb; YVÀi XYb'i bX'8Yb\_a À`Yfbž'X]Y'; YgW\]W\hYb'j cb'j Yf[Ub[YbYb9dcW\Yb'YfnÀ\`Yb"'9]b][Y'VYa Yf\_Ybgk YfhY'gY\Ybgk YfhYb'CfhYg]bX.

- 8 Ug F Uh\ Ui g 8 Y a Yb \ cfgh. '9]b 'VYY]b Xfi W\_Yb XYg ; YV Ài XY ']a 'Gh] 'XYf B Yi [ch] \_ ž 'X Ug '%, \* \$ 'Yf V Ui h 'k i f XY "
- 8]Y'5`hY'GWXi`Y.'9]b'[YgWX]WXhghfÀWXh][Yg'6UikYf\_ž'XUg \YihY'U`g'\_i`hifY``Yf'HfYZZdib\_h'[Ybihnh'k]fX"
- 8 Ug`Y\Ya U`][Y`5a hg[Yf]W\h. '9]b`6Y]gd]Y``ZØf`X]Y dfÀW\h][Y`6UW\_ghY]bUfW\]hY\_hi f`XYg`%- "`\*\J\f\i bXYfhg"

8]Y'GhUXhj Yfk U`hi b['\Uh'g]W\'i a 'X]Y'9f\U`hi b['i bX'DZY[Y'XYf\]ghcf]gW\Yb'Gi VghUbn'j cb'8Y`a Yb\cfgh'VYa Ø\hž'gcXUgg'j]Y`Y; YVÀi XY']b']\fYa 'i fgdfØb[`]W\Yb'; `Ubn'YfghfU\`Yb'': Ø\fi b[YbXi fW\X]Y'5`hghUXh'k YfXYb'\Ài Z][Yf'Ub[YVchYb'i bX'g]bX'Y]bY[fc»Ufh][Y'; Y`Y[Yb\Y]hž'h]YZYfY'9]bV`]W\_Y']b'X]Y'; YgW\]W\hY'i bX 5fW\]hY\_hi f'XYf'GhUXh'ni 'Yf\U`hYb''

Ni gàhn`]W\[ []Vh'Yg'cZh'GhUXhZØ\fi b[Ybž'VY]'XYbYb'ZUW\\_i bX][Y ; i ]XYg'ØVYf'X]Y'ZUgn]b]YfYbXY'; YgW\]W\[hY'i bX'X]Y'VYgcbXYfYb 9][YbgW\[UZhYb'XYf'5`hghUXh']bZcfa ]YfYb"'8]YgY'Hci fYb'g]bX'b]W\[h bi f'ZØf'; YgW\]W\[hg]bhYfYgg]YfhYž'gcbXYfb'Ui W\[ZØf': Ua ]`]Yb'i bX ; fi ddYb'[YY][bYhž'X]Y'[Ya Y]bgUa 'X]Y'GhUXh'Yf\_i bXYb'a ÒW\[hYb'' <]Yf'\_Ubbgh'Xi 'a Y\f'ØVYf'X]Y'A mh\Yb'i bX'@Y[YbXYb'YfZU\fYbž X]Y'8Y`a Yb\cfgh']b'XYb'`YhnhYb'\\$U\f\i bXYfhYb'[Ydf\[A][h'\UVYb'']

K Ybb Xi 'ni a 'YfghYb'A U`']b'8Y`a Yb\cfgh'V]ghž``Ugg'X]f'X]Y
; Y`Y[Yb\Y]h'b]W\h'Ybh[Y\Ybž'X]Y'5`hghUXh'i bX'U``']\fY'GW\ÀhnY'ni
Yf\_i bXYb"'9g']gh'Y]b'Cfhž'Ub'XYa '; YgW\]W\hY'`YVYbX]['k]fX'i bX
X]Y'?ca V]bUh]cb'Ui g'\]ghcf]gW\Yf'5fW\]hY\_hi f'i bX'a cXYfbYb
@YVYbggh]`'j YfnUi VYfh": Øf'k Y]hYfY' = Zcfa Uh]cbYb'ØVYf'X]Y

5`hghUXh'j cb'8Y`a Yb\cfgh'\_Ubbgh'Xi 'X]Y'c\overline{Z}n]Y``Y'K YVgY]hY'XYf GhUXh'i bhYf'XY`a Yb\cfgh"XY'VYgi WXYb"

## BUhi fYf`YVb]ggY ]a [fØbYb I a `UbX

8 Y`a Yb\cfghžY]bY`W\Ufa UbhY`GhUXh`]a `bÒfX`]W\Yb`8 Yi hgW\`UbXž VY[Y]ghYfh`b]W\h`bi f`a ]h`]\fYf`\]ghcf]gW\Yb`5`hghUXhž`gcbXYfb`Ui W\a ]h`Y]bYf`J]Y`nU\``Ub`BUhi fYf`YVb]ggYb`]a `i a `]Y[YbXYb`; fØb"`8]Y I a [YVi b[`XYf`GhUXh`V]YhYh`Y]bY`dYfZY\_hY`?i`]ggY`ZØf`U``Yž`X]Y`Zf]gW\Y`@ Zh`i bX`X]Y`GW\Òb\Y]h`XYf`BUhi f`[Yb]Y»Yb`a ÒW\hYb" 9[U`ž`cV`G]Y`[`Y]W\`i a `X]Y`9W\_Y`cXYf`Ui g`XYf`: YfbY`\_ca a Ybž`X]Y bUhi fbU\Yb`5hhfU\_h]cbYb`k YfXYb`G]Y`]b`]\fYb`6Ubb`n]Y\Yb°

±D'i ba ]hhY`VUfYf'BÀ\Y'j cb'8Y`a Yb\cfgh'Z]bXYb'g]W\'nU\`fY]W\Y'BUhi fgW\i hn[YV]YhY'i bX'DUf\_gž'X]Y']XYU``ZØf'GdUn]Yf[Àb[Yž FUXhci fYb'cXYf'Y]bZUW\'ni a '9bhgdUbbYb'g]bX"'9]bYg'XYf VY`]YVhYghYb'N]Y`Y']gh'XUg'K YghYfghYXYf'A ccfž'Y]bki bXYfgW\`ObYg'; YV]Yhž'XUg'g]W\'\Yfj cffU[YbX'ZØf'Ui g[YXY\bhY K UbXYfi b[Yb'Y][bYh"'A]h'gY]bYb'gW\a U`Yb'DZUXYb'i bX'XYf j ]Y`ZÀ`h][Yb': `cfU'i bX': Ui bU']gh'Yg'Y]b'k U\fYg'DUfUX]Yg'ZØf BUhi f`]YV\UVYf"

9]b'k Y]hYfYg'<][\`][\h']gh'XYf'GhUXhdUf\_'8Y`a Yb\cfghž'XYfb]W\h'bi f'Y]bY'[fc»Y'FUgYbZÀW\Y'i bX'gW\Uhh][Y'6Ài a Y'V]YhYhžgcbXYfb'Ui W\'Y]bYb'\_`Y]bYb'HY]W\ž'XYf'dYfZY\_h'ZØf'Y]bYYbhgdUbbhY'5i gnY]h']gh''<]Yf'\_ObbYb'G]Y'i bYfk UfhYhY6Y[Y[bi b[Yb'a]h'XYb'j YfgW\]YXYbYb'Jc[Y`UfhYb'Yf`YVYbž'X]Y\]Yf'`YVYbž'cXYf'Y]bZUW\'Y]bYb'[Ya Øh`]W\Yb'BUW\a]hhU['a]hY]bYa'6i W\'j YfVf]b[Yb''8]Y'gUbZhYb'K]YgYb'i bX'V`Ø\YbXYb6`i a Yb'gcf[Yb'ZØf'Y]b'a U`Yf]gW\Yg'5a V]YbhY''

K Ybb'G]Y'Yhk Ug'5VYbhYi Yf']WXYfYg'gi WXYbž'gc``hYb'G]Y'Y]bY': U\ffUXhci f'Xi fWX'X]Y'I a [YVi b[']b'6YhfUWXh'n]Y\Yb"'8]Y
FY[]cb'i a '8Y`a Yb\cfgh']gh'V]YhYh'Y]b'[i h'Ui g[YVUi hYg'BYhn'UbFUXk Y[Ybž'XUg'Xi fWX']Xm``]gWXY'@UbXgWXUZhYbž'K À`XYf'i bX: Y`XYf'ZØ\fh"'9]bY'[YZØ\fhY'FUXhci f'V]YhYh'b]WXh'bi f'Y]bYbUi g[YnY]WXbYhYb', VYfV`]W\_'ØVYf'X]Y'@UbXgWXUZhž'gcbXYfb'Ui WX]bhYfYggUbhY'9]bV`]W\_Y']b'X]Y'`c\_U`Y'H]Yf!'i bX'DZUbnYbk Y`h"

8]Y'K]`XYg\Ui gYf'; YYgh']gh'Y]b'k Y]hYfYf'[fc»Ufh][Yf'Cfhžia X]Y'BUhi f'fi bX'i a '8Y`a Yb\cfgh'ni 'Yf\_i bXYb"'A]h']\fYb\\Ø[Y`][Yb'@UbXgW\UZhYbž'hfUX]h]cbY``Yb'<Yi\UfnYb'i bX'\_`UfYb6\\W\Yb']gh'g]Y']XYU`'ZØf'gck c\``K UbXYfYf'U`g'Ui W\'FUXZU\fYf"<]Yf'[]Vh'Yg'Ui W\'nU\`fY]W\Y'D]W\_b]W\_d`\AhnYž'X]Y'dYfZY\_h'ZØf'Y]bYDUi gY']b'XYf'BUhi f'g]bX"'DUW\_Yb'G]Y'Y]b'V]ggW\Yb'9ggYb'Y]b'i bX[Yb]Y»Yb'G]Y'X]Y'fi\][Y'5ha cqd\\AfY"

8 UfØVYf`\]bUi g`]gh'XYf`GWX`cggdUf\_`]b`XYf`BÀ\Y`j cb 8 Y`a Yb\cfgh'Y]b`\_`Y]bYf'; Y\Y]a h]dd"'8 Yf`DUf\_`a ]h'gY]bYb \]ghcf]gWXYb`DZUbnYb`i bX'; fØbZÀWXYb`]gh'Y]b`[ fc» Ufh][ Yf`Cfhž i a `X]Y`Fi\Y`ni `[ Yb]Y» Yb`i bX`X]Y`GWX\Ob\Y]h'j cb`[ YdZY[ hYb ; UfhYbUb`U[ Yb`ni `VYk i bXYfb"'< ]Yf`Z]bXYb`Ui WX`[ Y`Y[ Ybh`]WX \_i`hi fY``Y`J YfUbghU`hi b[ Yb`ghUhhž`X]Y`Y]bYb`6Ygi WX`k Yfh`g]bX"

K Yf'Yhk Ug'a Y\f'5\_h]cbg`i gh'j YfgdØfhž'XYa 'Ya dZY\`Yb'k ]fž'XYb bU\Y[Y`Y[YbYb'6U[[YfgYY']b'XYf'I a [YVi b['ni 'VYgi WXYb"'8Yf GYY'V]YhYh'nU\`fY]WXY': fY]nY]ha Ò[`]WX\_Y]hYbž'XUfi bhYf GWkk]a a Ybž'6cchZU\fYb'cXYf'Y]bZUWX'bi f'XYb'HU['Ua 'K UggYf j YfVf]b[Yb"'K À\fYbX'XYf'Gca a Yfa cbUhY']gh'XYf'GYY'Y]b VY`]YVhYf'Cfh'ZØf': Ua ]`]Yb'i bX': fYi bXYž'X]Y'g]WX'YfZf]gWXYb'i bX YbhgdUbbYb'a ÒWXhYb"

 $: \emptyset f^*X]Y^*Yb][Yb\check{z}^*X]Y^*g]WX^*Z\emptyset f^*X]Y^*Iak Y^*h^*]bhYfYgg]YfYb\check{z}^*]gh^*Y]b\\ 6Ygi WX^*XYg^*bUhi fgWX i hn_i bX^*]WX Yb^*NYbhfi a g^*]b^*XYf\\ Ia[YVib['jcb^8Y^a Yb\cfgh^Y]b^*Aigg"^<]Yf^*_ObbYb^*6Ygi WXYf\\ a Y\f^*\emptyset VYf^*X]Y^*c_U^*Y^*_*`cfU^*i bX^*: Ui bU^*YfZU\fYb^*gck]Y^*Ub\\ : \emptyset \fib[Yb^*i bX^*K cf_g\cdg^*hY]^*bY\a Yb\check{z}^*X]Y^*g]WX^*a]h^*XYa^*9f\U^hXYf^*BUhi f^*VYgWX^AZh][Yb^*'9g^*[]Vh^*cZh^*Dfc[fUaaY^*Z\emptyset f^*?]bXYf\check{z}^*X]Y\\ XUg^*6Yk^*i gghgY]b^*Z\emptyset f^*X]Y^*bUhØf^*]WXY^*Ia[YVib[^*ZOfXYfb"$ 

9]b 'gcn]U`Yf '5gdY\_h'XYg'BUhi fYf`YVb]ggYg']b '8Y`a Yb\cfgh'g]bX'X]Y [Ya Y]bgUa Yb 'J YfUbghU`hi b[Ybž'X]Y 'fY[Y`a À»][']b 'XYb BUhi f[YV]YhYb 'ghUhhZ]bXYb"'<]Yf 'hfYZZYb 'g]W\ 'A YbgW\Ybž'i a 'X]Y BUhi f'ni '[Yb]Y» Ybž'g]W\ 'Ui gni hUi gW\Yb'i bX'Ub'[YZØ\fhYb K UbXYfi b[Yb'cXYf'7`YUb!i d!5\_h]cbYb'hY]`ni bY\a Yb"'8Ug'ghÀf\_h b]W\h'bi f'X]Y'; Ya Y]bgW\UZhz'gcbXYfb'a UW\h'Ui W\'GdU» i bX']gh Y]bY'[fc» Ufh][Y'A Ò[`]W\\_Y]hz'g]W\'U\_h]j ']b X]Y'FY[]cb

Ni gUa a YbZUggYbX``Àggh'g]WX`gU[Ybž'XUgg'X]Y`BUhi f`fi bX`i a 8Y`a Yb\cfgh'Y]bY`J]Y`nU\``j cb`9f`YVb]ggYb`i bX
9bhgdUbbi b[ga Ò[`]WX\_Y]hYb`V]YhYh"'CV'Ui Z'fi \][Yb
K UbXYfk Y[Ybž'VY]': U\ffUXhci fYb`cXYf'Ub`Y]bYa `gcbb][Yb`HU[
Ua `GYYž'\]Yf'Z]bXYb`G]Y`X]Y`dYfZY\_hY`5i gnY]h`]a ; fØbYb°

# ?i`]bUf]gW\Y`<][\`][\hg.'8]Y`fY[]cbU`Y ?ØW\Y

8 Y`a Yb\cfgh'V]YhYh'Y]bY'J]Y`nU\``\_i`]bUf]gW\Yf'9f`YVb]ggYž'X]Y
gck c\``9]b\Y]a ]gW\Y'U`g'Ui W\'6Ygi W\Yf'VY[Y]ghYfb"'8]Y'GhUXh
i bX']\fY'I a [YVi b['g]bX'fY]W\'Ub'fY[]cbU`Yb'GdYn]U`]hÀhYbž'X]Y
XUg'<Yfn'XYf'bcfXXYi hgW\Yb'?ØW\Y'k]XYfgd]Y[Y`b"'K Ybb'G]Y'Ui Z
XYf'Gi W\Y'bUW\'Ui h\Ybh]gW\Yb'; YgW\a UW\_gYf`YVb]ggYb'g]bXž
gc``hYb'G]Y'i bVYX]b[h'Y]b'dUUf'`c\_U`Y'; Yf]W\hY'Ui gdfcV]YfYb'i bX
X]Y'[Ughfcbca ]gW\Yb'9]bf]W\hi b[Yb'XYf'GhUXh'YbhXYW\_Yb"

9]b'VY`]YVhYg'; Yf]W\h']b'8Y`a Yb\cfgh']gh'X]Y'6Yf`]bYf'K Y]» Yž'Y]bYfZf]gW\YbXYg'6]Yfž'XUg'cZh'a ]h'G]fi d'Ufca Uh]g]Yfh'k ]fX"'9g'a UW\h g]W\'VYgcbXYfg'[i h'Ub'k Ufa Yb'Gca a YfhU[Ybž'k Ybb'a Ub']bY]bYa 'XYf'W\Ufa UbhYb'6]Yf[\AfhYb'XYf'GhUXh'g]hnh"'5VYf'Ui W\'XUg'C`XYbVi f[]gW\Y'6fchž'XUg'fY[]cbU``\Yf[YghY``h'k]fXž']gh'Y]bUVgc`i hYg'A i ggž'i bX'a Ub'Z]bXYh'Yg']b'j ]Y`Yb'6\AW\_YfY]Yb']b'XYfFY[]cb"'8]YgYg'\Yfn\UZhY'8i b\_Y`!cXYf'A]gW\Vfch'VYgh]W\h'Xi fW\'gY]bYb'j c``Yb'; YgW\a UW\_'i bX'gY]bY'fcVi ghY'?cbg]ghYbn''

- ; fØb\_c\`a ]h'D]b\_Y`` '9]b'hfUX]h]cbY``Yg'K ]bhYf[Yf]W\hž XUg']b'YXYa '\\f'j cb'XYb'9]b\Y]a ]gW\Yb'a ]h'JcfZfYi XY Yfk UfhYh'k ]fX"
- @UVg\_Ui g` '9]b`\Yfn\UZhYg'; Yf]W\hž'XUg`hmd]gW\Yfk Y]gY Ui g`[YdÒ\_Y`hYa 'F]bXZY]gW\ž'? UfhcZZY`b`i bX`FchY`6YYhY \Yf[YghY``h`k]fX"
- A Uh'YgZ]`Yhg` :: f]gWXYfž'a ]`XYf'<Yf]b[ž'XYf'cZh'a ]h</li>
   6fUh\_UfhcZZY`b`cXYf'Ui Z'Y]bYa 'GhØW\_'Fc[[YbVfch'gYfj]Yfh
   k ]fX"

8]Y'J]Y`ZU`h'XYf'FYghUi fUbhgž'7UZÅg'i bX'HfUX]h]cbg`c\_U`Y']b
8Y`a Yb\cfgh'ghY\h'XYa '[fc»Yb'5b[YVch'Ub'fY[]cbU`Yb
GdYn]U`]hÀhYb']b'b]W\hg'bUW\"'K Ybb'G]Y'Ui Z'XYf'Gi W\Y'bUW\'Y]bYa
[Ya Øh`]W\Yb'5VYbXYggYb'g]bXž'gc``hYb'G]Y'XUg'; Ugh\Ui g
HUbbYb\cZ'VYgi W\Ybž'k c'fY[]cbU`Y'? ØW\Y'a ]h'Y]bYa 'a cXYfbYb
Hk]gh'gYfj]Yfh'k]fX"'8]Y'i f][Y'5ha cgd\ÀfY'i bX'X]Y'\Yfn`]W\Y
; UghZfYi bXgW\UZh'kYfXYb'\AfYb'6Ygi W\'i bj Yf[Ygg`]W\'a UW\Yb"

: Øf'@]YV\UVYf'gØ» Yf'GdY]gYb'V]YhYh'X]Y'GhUXh'YVYbZU``g
nU\`fY]WXY'J Yfgi WXi b[Yb"'DfcV]YfYb'G]Y'XUg'8Y`a Yb\cfghYf
N]a hgWXbYW\_Ybž'Y]bY'[YgWXa UW\_j c``Y'@YW\_YfY]ž'X]Y'a]h
Zf]gWXYa 'N]a h'i bX'Ni W\_Yf'ni VYfY]hYh'k]fX"'8]YgY'\_Ògh`]WXYb
; YVÀW\_Y'Z]bXYb'G]Y']b'j]Y`Yb'6ÀW\_YfY]Yb'i bX'[Yb]Y» Yb'G]Y'Ua
VYghYb'a]h'Y]bYf'HUggY'Zf]gWX'[YVfØ\hYb'?UZZYY"

$f(x) = \frac{1}{2} \int_{\mathbb{R}^n} \frac{1}$
---

9]b^\Yfn\UZhYg^K]bhYf[Yf]W\h	
Ui gʻ; fØb_c\`žʻgYfj ]Yfh'a ]h	
Y]bYf'gdYn]Y``Yb'Kifgh"	
DØf]YfhYg'; Yf]W\h'a ]h	
F]bXZY]gW\ž'?UfhcZZY`b'ibX	
6YYhY''Y]bY	
BcfXgYYgdYn]U`]hÀh"	
: f]gW\Y` <yf]b[yž'x]y`]b'y]byf< td=""></yf]b[yž'x]y`]b'y]byf<>	
gdYn]Y``Yb`A Uf]bUXY`Y]b[ Y`Y[ h	
i bX <sup>·</sup> gYfj ]Yfh <sup>·</sup> k YfXYb"	
: f]gW\`[ YVUW_Yb`a ]h`N]a h`i bX	
Ni W_Yf` 'dYfZY_h'ni a '?UZZYY"	

9]b k Y]hYfYg'<][\`][\h']gh'XUg'9]bk c\bYfZYghž'XUg'YXYg' $\pm$ U\f']b XYf'GhUXh'[YZY]Yfh'k]fX"'8]YgYg': Ygh']gh'b]Wk h'bi f'Y]bY; Y'Y[Yb\Y]hž'X]Y'`c\_U`Y'?ØWkY'ni 'dfcV]YfYbž'gcbXYfb'Ui Wk'Y]b HfYZZdi b\_h'ZØf'X]Y'; Ya Y]bgWkUZh''<]Yf'Z]bXYb'G]Y'nU\`fY]WkY GhÀbXY'a]h'hfUX]h]cbY``Yb'; Yf]Wk hYbž'Zf]gWkYb'Ni hUhYb'i bX'gc[Uf?cWkXYa cbghfUh]cbYb'j cb'Y]b\Y]a]gWkYb'7\YZg"

K Yf'Y]bYb'VYgcbXYfYb'5b`Ugg'ZY]Yfhž'\_Ubb'Ui W\'X]Y j YfgW\]YXYbYb'K Y]b!'i bX'6]Yfj Yf\_cghi b[Yb']b'XYf'FY[]cb']b 6YhfUW\h'n]Y\Yb"'8]YgY'JYfUbghU`hi b[Yb'V]YhYb'X]Y'dYfZY\_hY; Y`Y[Yb\Y]hž'`c\_U`Y'K Y]bY'i bX'6]YfY'ni 'YbhXYW\_Ybž'k À\fYbX a Ub']b'[YgY``][Yf'Fi bXY'X]Y'\_i `]bUf]gW\Y'J]Y`ZU`h'XYf'FY[]cb [Yb]Y»h"

5VgWX`]Y» YbX``Àggh'g]WX`gU[Ybž'XUgg'8Y`a Yb\cfgh'b]WXh'bi f'Y]bY GhUXh'j c``Yf'; YgWX]WXhY'i bX`BUhi f`UbXgWXUZhYb']ghž'gcbXYfb'Ui WXY]b'\_i`]bUf]gWXYg'DUfUX]Yg"'CV'G]Y']b'Y]bYa '[Ya Øh`]WXYb FYghUi fUbh'X]b]YfYb'cXYf'X]Y'`c\_U`Yb'8Y`]\_UhYggYb'Ui Z'Y]bYa : Ygh'dfcV]YfYbž'X]Y'? ØWXY'X]YgYf'FY[]cb'k]fX'G]Y'g]WXYf`]WX VY[Y]ghYfb"

# ?ibghibX'?i`hif. AigYYbibX JYfUbghU`hib[Yb

8 Y`a Yb\cfghž'Y]bY'GhUXh'a ]h'Y]bYf'fY]W\Yb'\_i`hi fY``Yb; YgW\]W\hYž'V]YhYh'Y]bY'J]Y`nU\``j cb'AigYYb'i bX JYfUbghU`hi b[Ybž'X]Y'?i bgh!'i bX'?i`hi fVY[Y]ghYfhY [`Y]W\Yfa U»Yb'Ubn]Y\Yb"'K Ybb'Xi 'X]Y'GhUXh'VYgi W\ghž'[]Vh'Yg Y]b][Y'<][\`][\hgž'X]Y'Xi 'b]W\h'j YfdUggYb'gc``hYgh"

9]b'VY`]YVhYg'N]Y`ZØf'?i bgh`]YV\UVYf']gh'XUg'GhÀXh]gW\Yg
AigYia'8Y`aYb\cfgh"8]YgYg'AigYia'nY][h'Y]bY
ZUgn]b]YfYbXY'GUaa`ib['jcb'?ibghk Yf\_Yb'ibX'\]ghcf]gW\Yb
9IdcbUhYbž'X]Y'X]Y'9bhk]W\_`ib['XYf'GhUXh'ibX']\fYf'Ia[YVib[
ØVYf'X]Y'\*J\f\ibXYfhY'jYfXYih`]W\Yb"'6YgcbXYfg'X]Y'5igghY``ib[
nif'\*\DXighf]Y[YgW\]W\hY']gh'VYY]bXfiW\_YbX'ibX'V]YhYh'Y]bYb
9]bV`]W\_']b'X]Y'k]fhgW\UZh`]W\Y'9jc`ih]cb'XYf'FY[]cb"

9]b'k Y]hYfYg'<][\`][\h']gh'X]Y'; U`Yf]Y'ZØf'nY]h[YbÒgg]gWXY?i bghž'X]Y'fY[Y`a À»]['k YWXgY`bXY'5i gghY``i b[Yb'j cbfY[]cbU`Yb'i bX']bhYfbUh]cbU`Yb'? Øbgh`Yfb'dfÀgYbh]Yfh"'<]Yf'\UghXi 'X]Y'; Y`Y[Yb\Y]hž'a ]h'\_fYUh]j Yb'? ÒdZYb']b'? cbhU\_h'ni 'hfYhYbibX'j ]Y``Y]WXh'gc[Uf'X]Y'Y]bY'cXYf'UbXYfY'JYfb]ggU[Y'ni 'Yf`YVYb"8]Y'5ha cgd\ÀfY']b'XYf'; U`Yf]Y']gh'Y]b`UXYbX'i bX'cZh'[YgY``Yb'g]WXni 'XYb'5i gghY``i b[Yb'Ui WX'K cf\_g\cdg'i bX'8]g\_i gg]cbYbž'X]Y'ni fU\_h]j Yb'6YhY]`][i b['UbfY[Yb"

8]Y'GhUXhV]V`]ch\Y\_'8Y`a Yb\cfgh']gh'a Y\f'U`g'bi f'Y]b'Cfh'ZØf 6ØW\Yf`]YV\UVYf"'<]Yf'Z]bXYb'fY[Y`a À»]['\_i `hi fY``Y

JYfUbghU`hi b[Yb'ghUhhž'XUfi bhYf'@Ygi b[Ybž'@YgYk YhhVYk YfVY i bX'JcfhfÀ[Y'ni 'j YfgW\]YXYbYb'H\Ya Yb"'8]Y'6]V`]ch\Y\_']gh'Ui W\Y]b'\Yfj cffU[YbXYf'Cfhž'i a 'g]W\'a ]h'; `Y]W\[Yg]bbhYb'ni j YfbYhnYb'i bX'Ub'\_i `hi fY``Yb'8]q\_i qq]cbYb'hY]`ni bY\a Yb"

9]bik Y]hYfYgiVYXYi hYbXYgi9fY][b]gi]ghiXYfiK Y]\bUWX hga Uf\_hž XYfiUbiYXYa i5Xj Ybhgk cWXYbYbXYighUhhZ]bXYhiA ]hiZYghi]WX XY\_cf]YfhYbiGhÀbXYbži@]WXhYfbiibXiYW\_YfYbiGdY]gYbiAXhiXYf A Uf\_hinia i6iaa Y`biibXiJYfk Y]`YbiY]bii<]Yfik ]fXib]WXhibi f K Y]\bUWXhggh]aaib[ij YfVfY]hYhžigcbXYfbiUi WXiX]YiA Ò[`]WX\_Y]h [YVchYbž\UbX[YZYfh][hYi; YgWXYb\_YiibXi`c\_U`YiGdYn]U`]hÀhYbini Yfk YfVYb"

8]Y'GhUXh'\Uh'Ui W\'Y]b'fY[Yg'H\YUhYf'YVYb"'8 Ug'H\YUhYf
8Y`a Yb\cfgh'V]YhYh'Y]bY'VfY]hY'DU'YhhY'j cb'5i ZZØ\fi b[Ybž'j cb
\_`Ugg]gW\Yb'GhØW\_Yb'V]g'\]b'ni 'a cXYfbYb' \(\pi\gn\y\b)]Yfi b[Yb"'8]Y

J cfghY``i b['g]bX'a Y]gh'[i h'VYgi W\h'i bX'V]YhYb'Y]bY
\Yfj cffU[YbXY'A Ò[`]W\\_Y]hž']b'XUg'`c\_U`Y'?i `hi f`YVYb
Y]bni hUi W\Yb"'8]Y'GW\Ui gd]Y`Yf'i bX'XUg'HYUa '\]bhYf'XYb
?i `]ggYb'g]bX'`Y]XYbgW\UZh`]W\'i bX'Yb[U[]Yfhž'k Ug'YXY
5i ZZØ\fi b['ni 'Y]bYa 'VYgcbXYfYb'9f`YVb]g'a UW\h"

±0.18 Y`a Yb\cfgh'Z]bXYgh'Xi 'Ui W\'nU\`fY]W\Y'?Øbgh`Yfž'X]Y'a ]h
]\fYb.15 hY`]Yf!² ZZbi b[gnY]hYb'i bX'?i bghdfc Y\_hYb'Y]bYb'9]bV`]W\_
]b']\fY'5fVY]h'[YVYb"'C Zh'\_Ubbgh'Xi ']b'X]YgYb'5 hY`]Yfg'gY\Ybž'k ]Y
\_fYUh]j Y'⇒XYYb'YbhghY\Yb'i bX'i a [YgYhnh'k YfXYb"'9]b][Y'?Øbgh`Yf
V]YhYb'gc[Uf'K cf\_g\cdg'Ubž'VY]'XYbYb'Xi 'XY]bY'Y][YbYb
\_fYUh]j Yb': À\][\_Y]hYb'YfdfcVYb'\_Ubbgh"

JYfUbghU`hi b[	HYfa ]b	Cfh
8Y`a Yb\cfghYf	<b> </b>	GhUXhnYbhfi a
GhUX hZY gh		
K Y]\bUW\hga Uf_h	5XjYbhgkcW\YbYbXY	A Uf_hd`Uhn
	b	
H\YUhYfUi ZZØ\fi b[Y	; Ubn⁄À\f][	H\YUhYf
b		8Y`a Yb\cfgh

8 Y`a Yb\cfgh'\Uh'Y]bY``YVYbX][Y'?i`hi fgnYbYž'X]Y`gck c\`
6 Ygi W\Yf'U`g'Ui W\'9]b\Y]a ]gW\Y`Ubn]Y\h"8]Y`GhUXh']gh'Y]b`Cfhž'Ub
XYa '?i bgh'i bX'?i`hi f`k ]f\_`]W\'nY`YVf]Yfh'k YfXYbž'i bX'Yg'[]Vh
]a a Yf'Yhk Ug'BYi Yg'ni 'YbhXYW\_Yb"'9[U`ž'cV'Xi 'Ub'Y]bYf
?i bghUi gghY``i b['hY]`bY\a Ybž'Y]bY'H\YUhYfUi ZZØ\fi b['gY\Yb
cXYf'X]Y'bYi YghYb'K Yf\_Y'fY[]cbU`Yf'? Øbgh`Yf'VYk i bXYfb
a ÒW\hYgh' '8Y`a Yb\cfgh`\Uh'ZØf'YXYb'Yhk Ug'ni 'V]YhYb"

# 5\_h]j ]hÀhYb ZØf: Ua ]`]Yb. GdU» ZØf; fc» i bX ? `Y]b

8 Y`a Yb\cfgh'V]YhYhY]bY`J]Y`nU\``j cb`5\_h]j ]hÀhYbž'X]Y`gck c\``ZØf?]bXYf'U`g'Ui W\`ZØf'9fk UW\gYbY`gdUbbYbX'i bX`i bhYf\U`hgUag]bX"'9[U`ž'cV'=\f'Ui Z'XYf'Gi W\Y`bUW\`5VYbhYi Yfb']b`XYf'BUhi fžgdUbbYbXYb`9f`YVb]ggYb`]b`XYf'GhUXh'cXYf'\_fYUh]j Yb`K cf\_g\cdggY]Xž\]Yf'[]Vh'Yg`ZØf'YXY': Ua ]`]Y`Yhk Ug'ni YbhXYW\_Yb°

### $%"8YfGhUXhdUf_8Y`aYb\cfgh$

 $6Y[\ ]bbYb`k\ ]f`a\ ]h`XYa\ `GhUXhdUf_ž`XYf`Y]b`k\ i\ bXYfVUfYf`Cfh`ZØfY]bYb`:\ Ua\ ]`]YbUi\ gZi\ [\ `]gh"`8Yf`DUf_`V]YhYh`nU\`fY]WXY A O[\ `]WX_Y]hYb`ZØf`5_h]j\ ]hÀhYb`]a\ :: fY]Yb.$ 

- Gd]Y`d`AhnY`a ]h'j YfgWX]YXYbYb'; YfAhYb'ZØf'?]bXYf'U``Yf
   5`hYfg[fiddYb
- $\bullet \ \ \mathsf{K} \ \ \mathsf{UbXYf!} \ \ \mathsf{i} \ \ \mathsf{bX} \ \ \mathsf{F} \ \mathsf{UXk} \ \ \mathsf{Y} \ [\ \mathsf{Y} \ \ \mathsf{Z} \! \! \! \! \! \! \mathsf{D} \! \mathsf{f} \ \ \mathsf{X} \ ] \mathsf{Y} \ \ [\ \mathsf{UbnY} \ \ : \ \mathsf{Ua} \ \ ] ` ] \mathsf{Y} \\$
- D]W\_b]W\_d`AhnYž'k c'a Ub'a ]h'GbUW\_g'i bX'; YhfAb\_Yb YbhqdUbbYb'\_Ubb

< ]Yf`Z]bXYh'a Ub`Ui W\`cZh'JYfUbghU`hi b[Yb'i bX'Ci hXccf!</pre>

 $5_h]j_h^2hYbž^X]Y^g]W^3XYU^ZØf^Y]bYb^:Ua_]^]YbhU[_Y][_bYbž^n"6" CdYb!5]f!?cbnYfhY^cXYf^?]bXYfZYghY"$ 

#### &" 8]Y K YgYf!9a g!<U``Y

9]b'k Y]hYfYf'<chgdch'ZØf': Ua ]`]Yb']gh'X]Y'K YgYf!9a g!<U``Yž'X]Y fY[Y`a À»]['JYfUbghU`hi b[Yb'i bX'A YggYb'ZØf'; fc»'i bX'?`Y]b j YfUbghU`hYh''<]Yf'\_Ubb'a Ub.

- : UWA a YggYb 'VYgi WAYbž'n"6"'ni f': fY]nY]h[ YghU`hi b[ 'cXYf ZØf': Ua ]`]YbdfcXi \_hY
- GdcfhYj YbhgʻUbgWk Ui YbžʻX]YʻZØfʻX]Yʻ[ UbnYʻ: Ua ]`]Y [ YY][ bYhʻg]bX
- ?i bgh! i bX < UbXk Yf\_ga Àf\_hY VYgi WX Ybžk c a Ub \_fYUh]j Y DfcXi \_hY Yfk YfVYb \_Ubb

#### '"H]YfdUf\_'8Y`a Yb\cfgh

8 Y f 'H]Y f d U f \_ '] b '8 Y `a Y b \ c f g h '] g h 'Y] b 'k Y] h Y f Y g 'g W \ O b Y g 5 i g Z i [ g n] Y ` " '9 f '] g h ' \_ `Y] b ž 'U V Y f 'Z Y] b ' i b X ' V] Y h Y h

- 6Y[Y[bib[Yba]h\Y]a]gW\Yb'H]YfYb
- Gd]Y`VYfY]WXY'ZØf'?]bXYfž'i a 'g]WX'Ui gni hcVYb
- 6]`Xi b[gUb[YVchY' $\emptyset$ VYf'X]Y'\Y]a ]gW\Y'H]Yfk Y`h

<]Yf'\_ObbYb': Ua ]`]Yb'Y]bYb'YbhgdUbbhYb'HU['j YfVf]b[Ybž
k À\fYbX'X]Y'?]bXYf'X]Y'H]YfY'VYcVUW\hYb'i bX'gd]Y`Yf]gW\'`YfbYb"</pre>

## $("?fYUh]jYKcf_g\cdg'ZØf'?]bXYf$

±0.8 Y`a Yb\cfgh'[]Vh'Yg'j YfgW\]YXYbY'9]bf]W\hi b[Ybž'X]Y K cf\_g\cdg'ZØf'?]bXYf'UbV]YhYb"'8]YgY'K cf\_g\cdg'g]bX'Y]bY [fc»Ufh][Y'A Ò[`]W\\_Y]hž'\_fYUh]j Y': À\][\_Y]hYb'ni 'ZÒfXYfb'i bX [Ya Y]bgUa 'bYi Y'8]b[Y'Ui gni dfcV]YfYb.

- A U`Y!'i bX'6UghY`\_i fgY
- ?cW\!'i bX'6UW\_i fgYž'k c'\_`Y]bY'7\YZg']\fY'\_i `]bUf]gW\Yb :  $\dot{A}$ \][ \_Y]hYb'Ui gdfcV]YfYb'\_ $\dot{O}$ bbYb

 Aig]\_!'cXYf'HUbnghibXYbž'X]Y'6YkY[ib['ibX'F\mh\aig ZÒfXYfb

#### ) "GWk]a a cdYf8Y`a Yb\cfgh

8]Y 'GW\ k ]a a cdYf']gh'XYf'dYfZY\_hY 'Cfhži a 'a ]h'XYf': Ua ]`]Y 'Y]bYb HU[ 'j c``Yf'GdU\ ']a 'K UggYf'ni 'j YfVf]b[ Yb"' < ]Yf'[ ]Vh'Yg.

- 5i » Yb! i b X = bbYbdcc `g ZØf YXYg K YhhYf
- F]YgYbfihgWXYbž'X]Y'ZØf'j]Y``5XfYbU`]b'ibX': fYiXY'gcf[Yb]
- 9]b'K Y``bYggVYfY]W\'ZØf'X]Y'9fk UW\gYbYbž'k À\fYbX'X]Y
   ?]bXYf'gd]Y`Yb

8]Y'GWk]a a cdYf'Yf`Y]WkhYfh'Yg': Ua]`]Ybž'Y]bYb'U\_h]j Ybž'UVYf YbhgdUbbhYb'HU['ni'j YfVf]b[Yb"

#### \* "'A i gYYb ZØf X]Y [ UbnY : Ua ] ] Y

8 Y`a Yb\cfgh']gh'Ui W\'fY]W\'Ub'\_i `hi fY``Yb'5b[YVchYb'ZØf: Ua]`]Yb"'A i gYYb'V]YhYb'cZh']bhYfU\_h]j Y'5i gghY``i b[Yb'i bXgdYn]Y``Y'Dfc[fUa a Y'ZØf'?]bXYf"'Ni 'XYb'Ya dZc\`YbYb'A i gYYb[Y\ÒfYb.

AigYia	6YqcbXYf\Y]hYb

BcfXk YghXYi hgWXYg AigYia	⇒hYfU_h]j Y`5i gghY``i b[Yb`ni f
ZØf°±bXighf]Y[YgWX]WXhY	⇒xighf]Y[YgWX]WXhY
GhUXha i gYi a '8 Y`a Yb\cfgh	J]Y`nU\`jcb'5_h]j]hÀhYb'ibX
	: Ø\fi b[Yb`ZØf`?]bXYf

<]Yf'\_ObbYb'?]bXYf'i bX'9fk UWXgYbY'[Ya Y]bgUa '`YfbYb'i bX bYi Y'DYfgdY\_h]j Yb'YbhXYW\_Yb''

Ni gUa a Yb[YZUgghi]ghi8Y`a Yb\cfghiY]bik i bXYfVUfYfiCfhiZØf: Ua ]`]YbžiX]YibUWXi5\_h]j ]hÀhYbigi WXYbžiX]YiGdU» a UWXYbii bX
[`Y]WXnY]h][ ``Y\ffY]WXig]bX"'8]YiA ]gWXi b[ `Ui giBUhi fžiGdcfhž
?fYUh]j ]hÀhii bXi?i `hi fia UWXhiXYbi6Ygi WXii bj Yf[Ygg`]WX"'CViVY]a
Gd]Y`Ybi]a `DUf\_žiVY]a `6Ygi WXij cbiJYfUbghU`hi b[YbicXYfiVY]
K cf\_g\cdgi `\]Yfi\_ca a hiYXYfiUi ZigY]bYi?cghYb°

# ; $Y \setminus Y$ ]a h]ddg $Z\emptyset f$ i bj Y f[Ygg]WX Y 9fYVb]ggY

8 Y`a Yb\cfghžcZh`U`g`Y]b`j YfghYW\_hYg`¾ k Y``]a `BcfXk YghYb
8 Yi hgWX`UbXg`ØVYfgY\Ybž`V]YhYh`Y]bY`J]Y`nU\``j cb`; Y\Y]a h]ddgž
X]Y`Yg`k Yfh`g]bXž`YbhXYW\_h`ni `k YfXYb"`K Ybb`G]Y`UVgY]hg`XYf
Ui g[YhfYhYbYb`DZUXY`Ui Z`XYf`Gi WXY`bUWX`VYgcbXYfYb
9f`YVb]ggYb`g]bXž`XUbb`g]bX`G]Y`\]Yf`[YbUi `f]WXh][\*`@UggYb`G]Y
i bg`[Ya Y]bgUa `Y]b][Y`i b[YU\bhY`GWXÀhnY`X]YgYf`WXUfa UbhYb
GhUXh`YbhXYW\_Yb"

#### ?ibgh']a 'ÒZZYbh`]WX Yb'F Uia

9]bYg'XYf'j ]Y``Y]W\h'Ua 'a Y]ghYb'i bhYfgW\ÀhnhYb'<][\`][\hg']b
8Y`a Yb\cfgh']gh'X]Y'J]Y`nU\`'Ub'?i bghk Yf\_Yb']a 'ÒZZYbh`]W\Yb
FUi a "'6YgcbXYfg'X]Y'?i bgha Y]`Y'8Y`a Yb\cfgh`ÀXh'XUni 'Y]bž
gdUn]YfYb'ni '[Y\Yb'i bX'j YfgW\]YXYbY'=bghU``Uh]cbYb'i bX
G\_i `dhi fYb'ni 'YbhXYW\_Yb"'8]YgY': fY]`i Zh[U`Yf]Y'j Yfk UbXY`h'YXYb
GdUn]Yf[Ub[']b'Y]bY'\_i `hi fY``Y'9f\_i bXi b["'5W\hYb'G]Y'Ui Z'X]Y
Vi bhYb'K UbXa U`YfY]Yb'i bX'j ]Y``Y]W\h'gc[Uf'Ui Z'hYa dcfÀfY
5i gghY``i b[Ybž'X]Y'fY[Y`a À»]['ghUhhZ]bXYb"

#### JYfVcf[YbY'DUf\_g'i bX'; AfhYb

K À\fYbX'X]Y'cZZ]n]Y``Yb'DUf\_g']b'8Y`a Yb\cfgh'k]Y'XYf'

K ]ggYbgWX UZhgd Uf\_'cZh'VYgi WXh'k YfXYbž'[]Vh'Yg'Y]b][Y'j YfghY W\_hY

C UgYbž'X]Y'Y]bY'Fi\YcUgY'UVgY]hg'XYg'Hfi VY`g'V]YhYb''8Yf'

< ]ghcf]gWXY'; UfhYb']a 'GhUXhhY]`'?]fWXk Ym\Y']gh'Y]b'[i hYf'Cfhž'i a

XYf'<Y\_h]\_'ni 'Ybh\_ca a Yb'''<]Yf'\_ObbYb'G]Y'nk]gWXYb'U`hYb

6Ài a Yb'i bX'\]ghcf]gWXYb'6`i a YbfUVUhhYb'ZUb]YfYbž'k À\fYbX

G]Y'X]Y'BUhi f'[Yb]Y»Yb''DUW\_Yb'G]Y'Y]b'D]W\_b]W\_'Y]b'i bX

j YfVf]b[Yb'G]Y'XYb'BUWXa]hhU['i bhYf'ZfY]Ya'<]a a Y`°

### @c\_U`Y`J YfUbghU`hi b[Yb'i bX'A Àf\_hY

9]b YWX hYf; Y\Y]a h]dd g]bX X]Y ``c\_U`Yb J YfUbghU`hi b[ YbžX]Y `cZh b]WX h']b XYb [ fc» Yb FY]gYZØ\fYfb Yfk À\bh'k YfXYb "8]YgY fY]WX Yb j cb '? i bghl i bX '< UbXk Yf\_Yfa Àf\_hYb 'V]g`\]b `ni ': `c\a Àf\_hYb 'i bX '? i `]bUf]gWX Yb : YghYb "8]YgY J YfUbghU`hi b[ Yb 'V]YhYb 'b]WX h'bi f'X]Y A Ò[ `]WX\_Y]hž ``c\_U`Y `DfcXi \_hY 'i bX `8 Yg][ bg'ni '\_Ui ZYbž 'gcbXYfb Ui WX 'a ]h'XYb '9]bk c\bYfb ']bg'; YgdfÀWX 'ni '\_ca a Yb 'i bX 'X]Y ?i `hi f'\Ui hbU\ 'ni 'Yf`YVYb"

JYfUbghU`hi b[	8 Uhi a	Cfh
8Y`a Yb\cfghYf	× `]	<b>⇒</b> bYbghUXh
?ibgha Uf_h		8Y`a Yb\cfgh
: fØ\`]b[gYfkUW\Yb	5df]`	DUf_g <sup>·</sup> XYf <sup>·</sup> GhUXh
< Y fV ghZY gh	C_hcVYf	<uidhd`uhn< td=""></uidhd`uhn<>

#### 8]Y VYghYb 5i gg]W hgdi b\_hY

 $: \varnothing f'X]Y \Upsilon b][Yb\check{z}X]Y `[YfbY'X]Y `5i gg]W `h'[Yb]Y `y Yb\check{z}'[]Vh'Yg']b \\ 8 Y`a Yb \cfgh'Y]b][Y'hc``Y'Gdchg\check{z}X]Y'cZh'\varnothing VYfgY \Yb'k YfXYb''8 Yf' \\ < \varnothing [Y`]a `GhUXhdUf_'V]YhYh'Y]bYb'ZUbhUgh]gW Yb'6`]W_'\@VYf'X]Y \\ GhUXh\check{z}'VYgcbXYfg'VY]'GcbbYbi bhYf[Ub[''5i W XUg'K UggYfhi fa! 5fYU`']gh'Y]b'VY`]YVhYf'Cfh'Z\@f'9]b\Y]a ]gW Yž'i a 'Y]bZUW 'bi f'X]Y \\ Fi \Y'i bX'XYb'6`]W_'\@VYf'X]Y'8 AW Yf'ni '[Yb]Y `y Yb'''8]YgY'fi \][Yb D`AhnY'g]bX']XYU`'Z\@f'Y]bYb'fca Ubh]gW Yb'A ca Ybh'cXYf'i a Y]bZUW 'XYa '5``hU['ni 'YbhZ]Y\Yb''$ 

#### 9]bY\]ghcf]gWXYGhUXhhcif

#### 8Y`a Yb\cfghYf'6fUi \_i `hi f'YbhXYW\_Yb

9]b k Y]hYfYf; Y\Y]a h]dd ]gh X]Y 9f\_i bXi b[ XYf c\_U Yb 6fUi \_i `hi f" 6Ygi W\Yb G]Y X]Y 8 Y`a Yb \cfghYf 6fUi YfY]'i bX bY\a Yb G]Y Ub Y]bYf: Ø\fi b[ 'hY]`z VY]`XYf G]Y XYb 6fUi dfcn Ygg \_YbbYb`YfbYb" < ]Yf \UVYb G]Y X]Y A  $O[`]WX_Y]hz$ j YfgWX]Y XYbY 6]YfY ni 'j Yf\_cghYb'i bX X]Y ``Y]XYbgWX UZh`]WX Yb 6fUi a Y]ghYf ni hfYZZYbz X]Y ']\fY ?i bgh a ]h Ghc`n 'dZY[ Yb" 8]Yg ']gh b]WX h bi f Y]b ZYgh`]WX Yg '9f`YVb]gz 'gcbXYfb Ui WX 'Y]bY A  $O[`]WX_Y]hz$  a ]h XYb `c\_U`Yb 'HfUX]h]cbYb']b '? cbhU\_h ni 'hfYhYb"

## 6YgcbXYfY; YgWX ÀZhYi bX'6ci h]ei Yb

la 'XUg'k U\fY'<Yfn'jcb'8Y`a Yb\cfgh'ni 'Yf`YVYbž'gc``hYb'G]Y

A ]h'X]YgYb; Y\Y]a h]ddg'k ]fX'≒f'6Ygi W\']b'8Y`a Yb\cfgh'ni Y]bYa 'i bj Yf[ Ygg`]W\Yb'9f`YVb]g"'CV'G]Y'?i bgh`]YV\UVYfž BUhi f`]YV\UVYf'cXYf'Y]bZUW\'bi f'bYi [ ]Yf][ 'g]bXž'Yg'[ ]Vh']b'X]YgYf GhUXh'j ]Y`Y': UWYhhYb'ni 'YbhXYW\_Ybž'X]Y'≒fYb'5i ZYbh\U`h VYqcbXYfg'a UW\Yb'k YfXYb"

8 Y hU]`g

6 Ygi WX Yb 'G]Y 'i bg 'Ui Z. 'Y]bY!fY]gY "XY