

: Ua]`]YbghfY]h']b': Øfh\ 'Yg_U`]Yfh. 'G9? b]a a h'fUbXU`]YfYbXYb'A Ubb' ZYgh°

 $Dc`]nY]!: c`[YY]bgUhn`]b`: Øfh\.: Ua]`]YbghfY]h`Yg_U`]Yfhž ('!<math>\lambda$ \f][Yf'a]h`A YggYf`ZYgh[Ybca a Ybž'%ž* `Dfca]``Y"

: Øfh\ ž'8 Yi hgW\ `Ub X'! '5a : fY]hU[UVYb Xž'XYb'&%"'A Àfn'&\$&) ž
_Ua 'Yg'ni 'Y]bYa 'Yf\YV`]W\Yb'Dc`]nY]Y]bgUhn']b': Øfh\ ž'XYf'Xi fW\
Y]bYb': Ua]`]YbghfY]h'Ui g[Y`Ògh'k i fXY"'9]b'('!Â\f][Yf'A Ubb
j Yf`cf'c ZZYbVUf'X]Y'? cbhfc``Y'i bX'j Yfi fgUW\hY']b'gY]bYf'K c\bi b[
Yf\YV`]W\Yb'GUW\gW\UXYbž'U`g'Yf'a]h'Y]bYa 'A YggYf'a Y\fYfY
A ÒVY`ghØW_Y'VYgW\ÀX][hY"'₺'XYf': c`[Y'j Yf`]Y» Yb'X]Y
Ubk YgYbXYb': Ua]`]Yba]h[`]YXYf'X]Y'K c\bi b['i bX'j YfghÀbX][hYb
X]Y'Dc`]nY]"

8]Y '9]bgUhn_fàZhYž'XUfi bhYf'6YUa hY 'XYg
I bhYfghØhni b[g_ca a UbXcg'fl G?Ł'i bX'XYg
GdYn]U'Y]bgUhn_ca a UbXcg'fG9?Łž'k i fXYb'a cV]']g]Yfhž'i a 'X]Y
G]hi Uh]cb'i bhYf'?cbhfc``Y'ni 'Vf]b[Yb"'8Yf'A Ubbž'XYf'ni a
NY]hdi b_h'XYg'J cfZU``g'i bhYf'XYa '9]bZi gg'VYfUi gWXYbXYf'A]hhY`
ghUbXž'\Ubh]YfhY'k Y]hYf\]b'a]h'XYa 'A YggYfž'k Ug'X]Y'@U[Y
ni gÀhn`]WX'Ub\Y]nhY"I a '%-I\f'_cbbhY'Yf'gWX`]Y»`]WX
k]XYfghUbXg`cg'j ca 'G9?'ZYgh[Ybca a Yb'k YfXYb"

5`_c\c`Y]bZ`i gg`i bX`a YX]n]b]gW\Y 6YhfYi i b[

6Y] XYf: YghbU\a Y'ghY``hY'g]WX'\YfUi gž'XUgg'XYf'A Ubb'Y]bYb
5`_c\c`k Yfh'j cb'Yhk U'%ž*'Dfca]``Y'\UhhY"'Gck c\``X]Y
9]bgUhn_fÀZhY'U`g'Ui WX'XYf'F UbXU`]YfYf'gY`Vgh'V`]YVYb'i bj Yf`Yhnh"
BUWX'gY]bYf': YghbU\a Y'k i fXY'XYf'('!À\f][Y']b'X]Y'C V\i h'Y]bYf
: UWX_`]b]_'ØVYf[YVYbž'k c'Yf'a YX]n]b]gWX'VYhfYi h'k YfXYb'_Ubb"

8]Y'Dc`]nY]]bgdY_h]cb': Øfh\'dfØZh'XYfnY]h'a Ò[`]W\Y'ghfUZVUfY <UbX`i b[Yb']a 'Ni gUa a Yb\Ub['a]h'X]YgYa 'JcfZU``"

Ÿ\b`]W\Y`JcfZÀ``Y`\UVYb`_Øfn`]W\'Ui W\']b`XYf`I a [YVi b[`ZØf5i ZgY\Yb`[Ygcf[h"`Gc`_Ua `Yg`Ua '' \$"`C_hcVYf`&\$&(`]b GW\k UVUW\'ni `Y]bYa `9]bgUhn`Ui Z[fi bX`Y]bYf`6YXfc\i b[g`U[YžVY]`XYa `Y]b`(+!^À\f][Yf`HUhj YfXÀW\h][Yf`YVYbZU``g`a]h`Y]bYf K UZZY`Xfc\hY`i bX`gY]bY`: Ua]`]Yba]h[`]YXYf`VYXfc\hY"; `ØW_`]W\Yfk Y]gY`_cbbhYb`X]Y`: Ua]`]YbUb[Y\Òf][Yb`fYW\hnY]h][XUg`<Ui g`j Yf`UggYbžVYj cf`Yg`ni `k Y]hYfYb`9g_U`Uh]cbYb`_Ua "`8YfHUhj YfXÀW\h][Y`k i fXY`gdÀhYf`k]XYfghUbXg`cg`ZYgh[Ybca a Yb`i bX]b`Y]bYf`: UW_`]b]_`i bhYfgi W\hž`XU`dgmW\]gW\Y`DfcV`Ya Y`b]W\hUi g[YgW\`cggYb`k YfXYb`_cbbhYb"

< Ài g`]WXY'; Yk U`h'i bX'5`_c\c`

8]YgY'JcfZÀ``Y'k YfZYb'Y]b'@]Wkh'Ui Z'Y]b'Yfbghni bY\a YbXYg
[YgY``gWkUZh`]WkYg'DfcV`Ya .'XYb'Ni gUa a Yb\Ub['nk]gWkYb
5`_c\c``i bX'\Ài g`]WkYf'; Yk U`h"'@Ui h'Y]bYf'Ghi X]Y'XYg'6`Ui Yb
?fYi nYg'g]bX'j cf'U``Ya ': fUi Yb'\Ài Z]['CdZYf'j cb'; Yk U`h']b']\fYa\Ài g`]WkYb'I a ZY`Xž'k cVY]'Y]b'Yf\YV`]WkYf'5bhY]``X]YgYf'HUhYb']a
?cbhYl h'j cb'5`_c\c`a]ggVfUi Wk'ghUhhZ]bXYh"'8]Y'Bchk YbX][_Y]h
j cb'dfÀj Ybh]j Yb'A U» bU\a Yb'i bX'l bhYfghØhni b[ggmghYa Yb']gh
nk Y]ZY`gc\bY'j cb'nYbhfU`Yf'6YXYi hi b["

8]Y'Dc`]nY]'\Uh'ni [Yg]W\Yfhž']a :: U``Y'j cb'\Ài g`]W\Yb
GhfY]h][_Y]hYb'i bX'; Yk U`hg]hi Uh]cbYb'i a ZUggYbX'ni
]bhYfj Yb]YfYb"'8Yf'J cfZU```]b': Øfh\'nY][h'Y]bXfØW_`]W\ž'k]Y'k]W\h][
Y]bY'gW\bY``Y'FYU_h]cb'XYf'G]W\Yf\Y]hg_fÀZhY']ghž'i a 'X]Y
G]W\Yf\Y]h'U``Yf'6YhY]`][hYb'ni '[Yk À\f`Y]ghYb"

: Øf'k Y]hYfY' ±b Zcfa Uh]cbYb'ni f'H\Ya Uh]_'j cb'5`_c\c`'i bX'; Yk U`hž]bgVYgcbXYfY']a '?cbhYl h'\Ài g`]W\Yf'; Yk U`hž'Ya dZY\`Yb'k]f Y]bYb'6`]W_']b'X]Y'i a ZUggYbXYb'A UhYf]U`]Yb'XYg'6`Ui Yb'?fYi nYgž X]Y'XYhU]``]YfhY'9]bV`]W_Y']b'X]YgY'DfcV`Ya Uh]_'[YVYb"

 $: \emptyset f `k Y] hY fY `8 Y hU] `g `ni `XYb `J c fZ A``Yb `]b `: \emptyset fh `i b X `G W k U V U W V Y gi W Y b `G] Y `V] hh Y `X] Y `5 fh] _Y ``Ui Z `\dagger b : fUb _Y b `i b X `B c f X V U m Y fb "$

8 YhU]`g	
J c f ZU``	: Ua]`]YbghfY]hž'6YXfc\i b[
I fgUW Y	: Ua]`]YbghfY]hž'5`_c\c`ž'K UZZY
Cfh	: Øfh\ž'8Yi hgW\`UbX
: YghbU\a Yb	&
EiY``Yb	k k k "]bZfUb_Yb"XY
	k k k "bcfXVUmYfb"XY
	VYgcZf"V`UiYg_fYin"WX

6 Ygi WX Yb 'G]Y 'i bg 'Ui Z. 'b!U["X Y