

K YghZU`]U'J]bbi a . '> b[ghYf'DUi `'8Y]W_Y g]WXYfh'YfghYb'GU]gcbg]Y[

DUi `'8Y]_Y'g]\\\Yfh'K \ Ygh\\ZU`]\U'J]\bbi a '\XYb'\Yfgh\Yb \\ GU]\\\gcbg]\Y[']\b'\X\Yf'?\fY]\\\g`][\ U'6'a]\h'\Y]\b\Ya '\8cdd\Y`\d\U_'[\ Y[\ Yb \\ GJ '<c\\ `\U\f'=="

±b 'Y]bYa 'gdUbbYbXYb'5i ZY]bUbXYfhfYZZYb'\Uh'K YghZU`]U'J]bbi a gY]bYb'YfghYb'G]Y[']b'XYf'U_hi Y``Yb'GU]gcb'XYf'?fY]g`][U'6 Yffi b[Yb"'5a '&, "'5i [i gh'&\$&('i a '%, .\$\$'I \f'hfUZ'X]Y A UbbgW\UZh'Ui Z'XYb'GJ'<cW\`Uf'=i bX'_cbbhY'XUb_'XYf VYY]bXfi W_YbXYb'@Y]ghi b['j cb'DUi `'8Y]W_Y'a]h'&.\$'[Yk]bbYb" 8Yf'\f b[Y'BYi ni [Ub['Yfk]Yg'g]W\'U`g'YbhgW\Y]XYbXYf': U_hcf'XYg Gd]Y`qž']bXYa 'Yf'VY]XY'HcfY'ZØf'qY]b'HYUa 'Yfn]Y`hY"

8 Yf'G]Y['ghY``h'b]W\h'bi f'XYb'YfghYb'9fZc`['ZØf'K YghZU`]U'J]bbi a
]b'X]YgYf'GU]gcb'XUfž'gcbXYfb'nY][h'Ui W\'XUg'DchYbn]U``XYg
%-!'À\f][Yb'8Y]W_Yž'XYf']a 'Gca a Yf'bYi 'ni 'XYa 'JYfY]b'[Yghc» Yb
]gh"'A]h'gY]bYa '8 cddY`dUW_'_fYa dY`hY'Yf'X]Y'6Y[Y[bi b['ZÒfa `]W\
i a 'i bX'[UV'XYf'<Y]a a UbbgW\UZh'XYb'bÒh][Yb'GW\i Vž'i a 'X]Y
XfY]'Di b_hY'YbX[Ø`h]['ni 'g]W\Yfb"'8 Yf'5i Zhf]hh'XYg'hU`Ybh]YfhYb
Mci b[ghYfg'_ÒbbhY']\b'ni a 'GW\`ØggY`gd]Y`Yf'XYf'A UbbgW\UZh
a UW\Yb'i bX']\a 'Ui W\'VY]'XYb': Ubg'XYg'JYfY]bg'gW\bY``'Y]bYb
BUa Yb'Y]bVf]b[Yb"

8 Y] W_Y '[`À b n h '] b 'X Y b 'Y b hg W X Y] X Y b X Y b A ca Y b h Y b

8]Y'YfghYb'VY]XYb'Gd]Y`Y'XYf'GU]gcb'\UhhYb'ZØf'K YghZU`]U'J]bbi a _Y]bYb'; fi bX'ni f': fYi XY'[Y`]YZYfh"'8cW\'8Y]W_Y'VYk]Yg']b X]YgYa 'Gd]Y`'gY]bY': À\][_Y]hYb'i bX'nY][hYž'XUgg'Yf'XYf A UbbgW\UZh']b'k]W\h][Yb'G]hi Uh]cbYb'\Y`ZYb'_Ubb"'GY]bY'HcfY $\label{thm:conditional} Z]Y`Yb`]b`YbhgWXY]XYbXYb`D\UgYb`XYg`Gd]Y`gž`k cXi fWX`Yf`XYb I bhYfgWX]YX`Ui ga UWXhY`i bX`[`Y]WXnY]h][`XUg`GY`Vghj YfhfUi Yb gY]bYf`A]hgd]Y`Yf`ghÀf_hY"$

9]b'k Y]hYfYg'VYXYi hYbXYg'9fY][b]g'ghY\h'VYfY]hg'j cf'XYf'HØf.
8Y]W_Y'\Uh'XYb'K i bgW\'[YÀi »Yfhž'Ui W\']a '_ca a YbXYb'Gd]Y`
[Y[Yb'XYb'JZ6'K U`hfcd'=]b'XYf'GhUfhY`Z'ni 'ghY\Yb"'GY]b
i bYfa ØX`]W\Yf'9]bgUhn'i bX'X]Y'ni `Yhnh'[YnY][hYb'@Y]ghi b[Yb
`UggYb'XUfUi Z'gW\`]Y»Ybž'XUgg'Yf'g]W\'X]YgYb'D`Uhn'Ui W\'j YfX]Ybh
\Uh'''HfU]bYf'i bX'HYUa 'k YfXYb'X]Y'_ca a YbXYb'HU[Y'bi hnYbž'i a
X]Y'VYghY'5i ZghY``i b['ni 'Z]bXYbž'i a 'XYb'GW\ki b['XYg'G]Y[Yg
k Y]hYf'a]hni bY\a Yb"

8 Yf YfghY 'GU]gcbg]Y[']gh ZØf 'K YghZU`]U 'J]bbi a 'j cb'[fc» Yf 6YXYi hi b["'9f'_ObbhY 'b] W h bi f 'X Ug 'GY `VghVYk i gghgY]b 'XYf A UbbgW UZh 'ghY][Yfbž 'gcb XYfb 'Ui W 'X]Y '[YgUa hY '8 mb Ua]_ 'ZØf 'X]Y _ca a YbXYb 'Gd]Y `Y 'VYY]b Zi ggYb "'A]h 'DUi ` '8 Y] W_Y 'Ub 'XYf 'GY]hYž XYf 'a O[`]W Yfk Y]gY ']b 'Hcd Zcfa ']ghž []Vh 'Yg 'j]Y `Y' ; fØb XY 'ZØf Cdh]a]ga i g" '8]Y 'I bhYfghØhni b['XYf': Ubg 'k]fX 'YggYbn]Y ` `gY]bž k Ybb 'X Ug 'HY Ua 'X]Y 'b ÀW ghYb' < YfUi gZcfXYfi b[Yb 'Ubb]a a h"

8]Y J]bbi a Yf 5b\àb[Yf XØfZhYb VYgcbXYfg YfZfYi h gY]bž Y]bYb gc hU Ybh]YfhYb Gd]Y Yf]b]\fYb FY]\Yb ni k]ggYbž XYf XUni]b XYf @U[Y]ghž XUg Gd]Y `ni YbhgWX Y]XYb " 8]Y _ca a YbXYb K cWXYb _ObbhYb YbhgWXY]XYbX ZØf X]Y 9bhk]W_`i b[X]YgYf 'i b[Yb HU YbhY gY]bž i bX 8Y]W_Yg F c `Y _ObbhY g]WX U`g VYgcbXYfg k Yfhj c `Yfk Y]gYb " GY]bY @Y]ghi b[Yb Ui Z XYa D`Uhn k YfXYb [YbUi VYcVUWX hYhž i bX XYf 8 fi W_ž fY[Y`a À»][UVni `]YZYfbž _ObbhY bcWX [fO» Yf k YfXYb"

8 YhU]`g

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