

5fVY]hg`cg][_Y]h'ghY][h.'=b[Yb]YifY']b K c`ZgVif['ghUf_'VYhfcZZYb'

±0 '< Y`a ghYXh'nY][h'XYf'5fVY]hga Uf_h'JYfÀbXYfi b[Yb. 5fVY]hg`cgYbei chY 'ghY][hž'±b[Yb]Yi fY 'VYhfcZZYbž'k À\fYbX'±H! : UWX_fÀZhY'[YZfU[h'q]bX"



< Y`a ghYXhž'8Yi hgWX`UbX'!'8]Y'JYfÀbXYfi b[Yb'Ui Z'XYa
5fVY]hga Uf_h'i bX']b'XYf'K]fhgWXUZh'YfZcfXYfb'bYi Y'GhfUhY[]Yb
i bX'5bdUggi b[Ybž'i bX'XUg'VY_ca a h'b]WXh'bi f'X]Y
5i hca cV]`]bXi ghf]Y'ni 'gdØfYb'''@Ui h'bYk g', 'gh]Y['X]Y
5fVY]hg`cgYbei chY']b'8Yi hgWX`UbX']a 'A U]'&\$&) 'Ui Z'*ž) 'DfcnYbhž
k Ug'ZØf'(''() * 'A YbgWXYb'VYXYi hYhYž'XUgg'g]Y'c\bY'&V'k UfYb'''9]b
VYgcbXYfg'VYgcf[b]gYffY[YbXYf'HfYbX'nY][h'g]WX'VY]'XYb

\$\DEL_{\text{P}}[Yb]Yi fYbž'j cb'XYbYb'%' +'Ui g'K c`ZgVi f['i bhYf'X]YgYb
5fVY]hg`cgYb'j YfnY]WXbYh'g]bX''</pre>

8]Y'ghY][YbXY'5fVY]hg`cgYbnU\``hf]ZZh'Ui W\'6fUbW\Ybž'X]Y'nijcf U`g'g]W\Yf'[U`hYb"'HUhgÀW\`]W\'[UV'Yg'Y]bYb'gdfib[\UZhYb'5bgh]Y[jcb'-)'9bh`Uggib[Yb']b'XYf'<YfghY``ib['jcb'?fUZhkU[Yb'ibX !hY]`Yb']b'K c`ZgVi f['U``Y]b'nk]gWXYb'*Jbi Uf'i bX'A U]"'8]Yg'ghY``h Y]bYb'5bgh]Y['j cb'ZUgh') \$'DfcnYbh']a 'J Yf[`Y]WX'ni a 'J cf'U\f'XUf" I `Z'GhY]ba Ubb'j cb'XYf'5[Ybhi f'ZØf'5fVY]h']b'<Y`a ghYXh'gdf]WXh j cb'Y]bYa 'bY[Uh]j Yb'HfYbX ž'XYf'g]WX'ØVYf'j YfgWX]YXYbY 6Yfi Zg[fi ddYb'YfghfYW_h"

Ghfi _hi fY``Y'J YfÀbXYfi b[Yb'i bX'bYi Y 5bZcfXYfi b[Yb

<]bhYf'X]YgYb'9bhk]W_`i b[Yb'ghY\Yb'ghfi _hi fY``Y'JYfÀbXYfi b[Ybž
]bgVYgcbXYfY']b'XYf'5i hca cV]`]bXi ghf]Y"'8]Y'J85!Ghi X]Y'k Y]gh
XUfUi Z'\]bž'XUgg'X]Y'6fUbW\Y'Y]bYb'h]YZ[fY]ZYbXYb'K UbXY`
Xi fW\`Ài Zhž'VYX]b[h'Xi fW\'X]Y'HfUbgZcfa Uh]cb'ni f
9`Y_hfca cV]`]hÀhž'8][]hU`]g]Yfi b['i bX'k]fhgW\UZhgdc`]h]gW\Y
I bg]W\Yf\Y]hYb"'Dfc[bcgYb'nY][Ybž'XUgg'V]g'ni a '\\J\f'&\\$')'fi bX
%-\$"\$\$\$'5fVY]hgd`AhnY']b'X]YgYf'6fUbW\Y'j Yf`cfYb'[Y\Yb
_`ObbhYb"'9]b'J]YfhY`'X]YgYf'5fVY]hgd`AhnY']gh'VYfY]hg'gY]h'\&\%-kY[[YZU``Yb"</pre>

 $\label{lem:continuity} $J \circ G'U``Ya `X]Y'9`Y_hf]Z]n]Yfi b[`XYg'5bhf]YVgghfUb[g'ZØ\fh'ni `Y]bYf $VgW\k\ AW\i b[`XYf'6YgW\AZh][i b[`]b`XYf': U\fnYi [\YfghY``i b["K\ A\fYbX'Y]b][Y'6Yfi Zg[fi ddYbž'k]Y'A UgW\]bYbVUi `i bX $A YhU``VYUfVY]hi b[ž'VYgcbXYfg'ghUf_'j cb`&Vj Yf'i ghYb'VYhfcZZYb g]bXž'Vcca Yb'6Yfi ZY']b`XYf'\DZcfa Uh]_'i bX`XYf'hYW\b]gW\Yb 9bhk]\w_`i b["'HUhg\AW\`]W\ j YfnY]\w\bYhYb'X]Y'\H!6Yfi ZY']b`XYf $5i hca cV]`]bXi ghf]Y'gY]h'\&\%' 'Y]bYb'5bgh]Y['j cb',) 'DfcnYbh'' $$$

8]Y Gi WX Y bUWX bYi Yb HU`YbhYb

8]YgY'9bhk]W_`i b[Yb'g]bX'b]W\h'bi f'ZØf'X]Y'6YgW\ÀZh][hYb'j cb
6YXYi hi b[žgcbXYfb'ghY``Yb'Ui W\'I bhYfbY\a Yb'j cf'[fc»Y
<YfUi gZcfXYfi b[Yb"G]Y'a ØggYb'g]W\'Ub'X]Y'j YfÀbXYfhYb
FU\a YbVYX]b[i b[Yb'UbdUggYbži a ']\fY'K YhhVYk YfVgZÀ\][_Y]h
ni 'VYk U\fYb"'Ni XYa 'Vf]b[h'X]Y'\c\Y'\bj Ygh]h]cbggi a a Y'j cb
&, \$'A]``]UfXYb'9i fcž'X]Y'XYi hgW\Y'5i hc\YfghY``Yf'V]g'&\$&, ']b
: cfgW\i b['i bX'9bhk]\W_`i b['ghY\W_Ybž'Y]bY'[Yk]ggY'<cZZbi b['ZØf
X]Y'Ni _i bZh'a]h'g]W\"

±og[YgUa h'nY][h'g]WX ž'XUgg'b]WX h'bi f'X]Y'5i hca cV]`VfUbWXYž
gcbXYfb'Ui WX'UbXYfY'GY_hcfYb'XYb'< YfUi gZcfXYfi b[Yb'XYg
A Uf_hYg'VY[Y[bYb'a ØggYb"'8Yf'K Y['ni 'Y]bYf'bUWX\U`h][Yb'i bX
ni _i bZhgg]WXYfYb'6YgWXÀZh][i b['V`Y]Vh'ghY]b][ž'i bX'X]Y
Bchk YbX][_Y]h'dc`]h]gWXYf'I bhYfghØhni b['k]fX']a a Yf'Xf]b[`]WXYf"
I a gc'k]WXh][Yf']gh'Ygž'X]Y'K Y]WXYb'ZØf'X]Y'Ni _i bZh'[i h'ni
ghY``Yb"</pre>

8 Y hU]`g	
Cfh	< Y`a ghYXhž'8Yi hgWX`UbX
EiY``Yb	• k k k "b Y k g' , "X Y
	• k k k "j XU"XY
	• ghUh]gh]_"UfVY]hgU[Ybhif"XY

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