

: fca 'h\ Y'Z]fgh'YbWci bhYf'hc'h\ Y'XfYUa k YXX]b[.'5bbU'UbX'8Uj]X'WY`YVfUhY'`cjY°



@YcVYbž'² ghYffY]W '!'H\Y'ghcfmcZ'5bbUž'Zcfa Yf`m'Gh]W\Y`ž'UbX 8 Uj]X'Cj Yfh][]Wg'Zfca 'Gh"A]W\UY``]g'U'VYUi h]Z ``Yl Ua d`Y'cZ'hfi Y `cj Y'h\Uh'a U_Yg'h\Y'Wcj YbUbh'ghfcb['Zcf'`]ZY"'H\Y'Wci d`Yž'k \c a Yh']b'@YcVYb']b'&\$%- ž'ZY`h'U'gdYW]U``WcbbYWh]cb'Zfca 'h\Y'ghUfh h\Uh'g\Y'bc'`cb[Yf'`Yh'[c"'Cb'*abY'+ž'&\$&) ž'h\Ym'[Uj Y h\Ya gY'j Yg'h\Y'mYg']b'h\Y'fY[]ghfmcZZ]WY']b'@YcVYb'UbX'\YfU`XYX U'bYk'W\UdhYf']b'h\Y]f'`]j Yg"'H\Y'k YXX]b[']hgY`Z'hcc_'d`UWY']b'h\Y @UbX\chY`FY]h]b[V`]W_']b'; U]ž'k \YfY'ZYgh]j Y'ZccXž'`Ui [\hYf'UbX W\YVfUh]cbg'g\UdYX'h\Y'XUm'i bh]`'h\Y'YUf`m'\ci fg'cZ'h\Y a cfb]b["'5'gdYW]U`'XYhU]`.'H\Y'VUVm'Vi a d'i bXYf'5bbUfg'k YXX]b[XfYgg'k Ug'U'g][b'cZ'h\Y'i dWca]b['Uff]j U`'cZ'\Yf'Z]fgh'W\]`X hc[Yh\Yf']b'5i [i gh'&\$&)"'

fca Ubh]Wk YXX]b[hf]d hc =hU`m

ibZcf[YhhUV`Y`\cbYmaccb]b=hU`m"=hU`m]gbchcb`mZUacigZcf]hg W`]bUfmXY`][\hgžVih'U`gcZcfVfYUh\hU_]b['k YXX]b['`cWUh]cbg" H\YfY']g'YIUWh`m'h\Y'f][\h'd`UWYZcf'YjYfm'Wcid`Y'hcgdYbX'h\Y dYfZYWhjUWUh]cb": fca'h\Y'd]WhifYgeiY'VYUWXYg'cZ'GUfX]b]U'hch\Y'\]ghcf]WU`'W]h]Yg'cZ'HigWUbm!Uh'&, 'XY[fYYg'UjYfU[YhYadYfUhifY']b'giaaYfž']h']g'\UfX`m'gifdf]g]b['h\Uhi=hU`m']g'cbY'cZh\Y'hcd'hfUjY`'XYgh]bUh]cbg'Zcf'ZfYg\`m'dUfhbYfg"'

'7i `]bUfm'XY`][\ hg'Zcf'h\Y'k YXX]b[WW`YVfUh]cb'

`H\Y`W``]bUfm'XY`][\hg`d`Um'U`W\bhfU``fc`Y`]b`k YXX]b[`UbX
\cbYma ccb"'=hU`]Ub`k YXX]b[g'UfY'_bck b'Zcf'h\Y]f'f]W\`k YXX]b[
X]bbYfž'k\]W\`cZhYb`]bWi XYg'gYj YfU``Wci fgYg"'8Y`]W]ci g
\ca Ya UXY'dUghU`UbX'Z]bY`W\]Ubh]'Zfca 'Hi gWUbm'g\ci `X'bch'VY
a]gg]b["'H\Y'hfUX]h]cbg'h\Uh'VY`cb['hc'h\Y'W'`YVfUh]cb'U`gc'[]j Y
h\Y'k YXX]b[g'U'gdYW]U``gdY``"'H\Y'ZYgh]j U`']g'cZhYb'UW\ca dUb]YX

Vm`\Uddmaig]WUbX`U``ch`cZ`XUbW\ž`k\]W\`XcYg`bch``Yh`Ubm`[iYghg]h`gh]``"

 $\label{thm:wwb:vy:u} $$ WU''Yb[Y''@Ub[iU[Y'VUff]Yfg'UbX'VifYUiWfUh]cb']b'=hU'm'WUb'VY'U WUU''Yb[Y'''@Ub[iU[Y'VUff]Yfg'UbX'VifYUiWfUh]W\ifX'Yg'giW\'Ug h\Y'dfcWifYaYbh'cZ'aUff]U[Y'WYfh]Z]WUhYg'WUb'VY'ghfYggZi''' $$ <ck Yj Yfž'U'k YXX]b['d'UbbYf'WUb'VY'cZ'[fYUh'\Y'd'UbX'aU_Y'dfYdUfUh]cb'YUg]Yf'Vmig]b['`cWU''WcbhUWhg'''H\Ub_g'hc'h\Y''ubXgWUdYž'h\Y'''' a i `h]hi XY'cZ'dcgg]V]`]h]Yg'UbX'h\Y'VYUihm'cZ'h\Y'`UbXgWUdYž'h\Y Wcid'Yg']b'h\Y'YbX'cb'm'\UjY'h\Y'U[cbm'cZ'W\c]W'''' $$$

 $\label{eq:complex} FY[UfX`Ygg`cZ'h\Y`W\U``Yb[Ygž`5bbU`UbX`8Uj]X`]g`bck`h]aY`hc`cc_'ZcfkUfX`hc`h\Y]f`Z\hi fY`hc[Yh\Yf`!`Ug`U`ZUa]`m''`<Yf`kYXX]b[]b`@YcVYb`kUg`cb`m'h\Y`Z]fgh`ghYd`cb`Ub`YlW]h]b[`bYk``]ZY`dUh\h\Uh``YUXg`\Yf`hc`\hU`m''\\hi]g`cb`m'hc`VY`\cdYX`h\Uh`h\]g`hf]d`k]```VYUg`Z\```cZ``cjY`UbX`^cm'Ug`mcif`V][`XUm''$

8 Y hU]`g	
Cfh	@YcVYbž ^{·2} ghYffY]WX
EiY``Yb	k k k "_`Y]bYnY]hi b["Uh
	\cWX nY]hgfY]gY"]bZc
	• d`Ubhj]VYg"Wca

6Ygi WXYb 'G]Y 'i bg 'Ui Z. 'a Y]b!k]Yb "bYh