



7ci fgY⁻Cj Yfj]Yk

GHJZ7cbHJWh8YHJ]`g

7cbj Ybcfg

B Ua Y	9a U]`	5j U]`UV]`] m	@cWUh]cb	D\cbY
DYma Ub A cgHJ[\]a]	dYma Ub4 i bgk "YXi "Ui			\$&-',))‰ &

8Ya cbglfUhcfg

B Ua Y	9a U]`	5j U]`UV]`] m	@cWUh]cb	D\cbY
: UHYa Y\ Gc`Y]a Ub]	Z'gc`Y]a Ub]4 i bgk "YXi "Ui			

GWXcc`7cbHJWhi±bZcfa Uh]cb

GW.cc``cZA]bYfU`g`UbX`9bYf[mF Ygci fV****{g C`X`A U]b`6i]`X]b[ž`@Yj Y``%z'%) - `f? %) Ł **** I BGK `GM8B9MBGK `&\$) & 5**,** GHF **\$** @ 5 **, .**

9b[]bYYf]b['Gh XYbhG¼fj]WY

9. a YfY"hYUVX]b[4.,i bok "YXi.**

K. kk k "Yb[]bYYf st. "bgk "Yat to byfU'g!YbYf[mfYgci fWg

7ci fgY 8YHJ] g

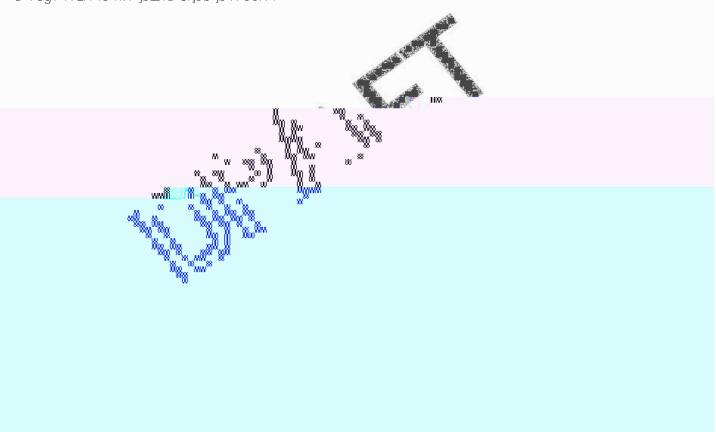
I b]hg cZ7fYX]h**

Giaa UfmcZh\Y 7ci fgY

 $\label{thm:continuous} $$H\YcfmcZhfUbg]Ybhik Y``hYgh]b["`DfUW]WU``UgdYWg`cZXYg][b`UbX`dYfZcfa UbW'`cZZ]Y`X`hYgh]bghfi a YbhUh]cb" DfYggi fY`XfUk Xck b`hYghg": U``!cZZhYghg"A i `h]!fUhY`hYghg"; Ug`k Y```hYgh]b[": `ck !UZhYf!Zck "'=gcW.fcbU``UbX]gcW.fcbU``a cX]Z]YX"`=bhYfZYfYbW'`hYgh]b["'Di `gY`hYgh]b["'8 f]``ghYa `hYghg": fUWi fYX`fYgYfj c]f`hYghg" 5bU`mg]g`cZa i `h]d\UgY`Zck `hYghg"$

HYUW]b[GhfUhY[]Yg

D`YUgY`fYZYf`hc`h\Y`]bZcfa Uh]cb`]b`A ccX`Y



5ggYgga Ybh

5ggYgga Ybh'tUg_	K Y][\h	8iY'8UHY	7 ci fgY @YUfb]b[Ci hWca Yg 5ggYggYX
%":]bU``91 Ua	*\$1	Bch5dd`]WUV`Y	
&"'K YY_`m'8]gW gg]cb	% \$I	Bch5dd`]WUV`Y	
' "'5gg][ba Ybhg	' \$1	Bch5dd`]WUV`Y	

5ggYgga Ybh% :]bU`9l Ua

:]bU``9| Ua `Xi f]b['h\Y`Y| Ua 'dYf]cX`Uh'h\Y`YbX`cZh\Y`hYfa "`

5ggYgga Ybh& K YY_`m8]gW gg]cb

 $5\,\hbox{WMj Y'dUfhW]Uhcb']b'K\,\,YY_`m'8\,]g\hbox{W'gg]cb'cb'A}\,\,ccX`Y''$

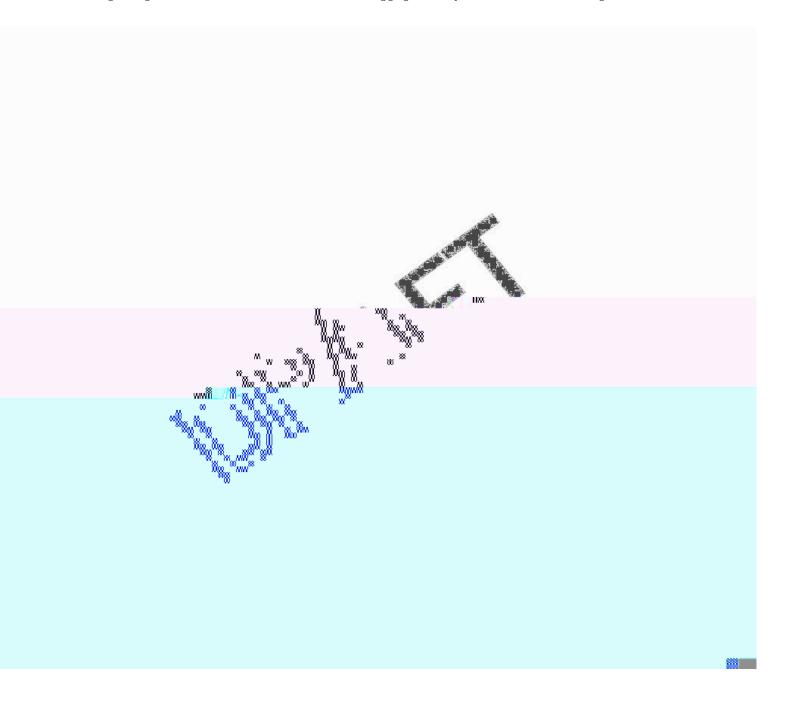
5ggYgga Ybh' . 5gg][ba Ybhg

H\YfY'UfY'('5gg][ba Ybhg"

 $\text{H} \land \text{Y} \land \text{B} \land \text{H} \land \text{ZC} f \Rightarrow \text{G} \text{G} \text{G} \text{B} \text{B} \text{C} \text{B} \text{C} \text{A} \text{B} \text{C} \text{C} \text{B} \text{C} \text{B}$

5 h Y b X U b W F Y e i] f Y a Y b h g

 $\hbox{Ghi XYbhg'UfY'ghfcb[`m`YbWc'i fU[YX'hc'UhhYbX'U```WUggYg'UbX'fYj]Yk'``YWhfY'fY'WcfX]b[g''' } \\$

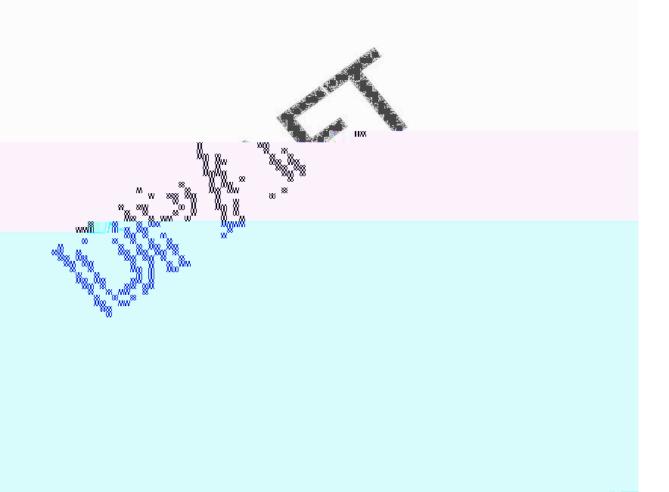


FYgci fWYg

DfYgWf]VYX`F Ygci fWYg`

 $Gi \ ddcfna \ UhYf]U``Zcf'h\]g`Wci \ fgY`]bWi \ X]b[\ \check{z}k\ \YbYj\ Yf`Uj\ U]`UV`Y\check{z}`Wcd]Yg`cZ`YWi \ fY`bchYg\check{z}fYWca \ a \ YbXYX \ fYUX]b[\ g\check{z}YhW'`WUb`VY`Zci \ bX`cb`A \ ccX`Y"$

i



Gi Va]gg]cb cZ5ggYgga YbhHUg_g

H\Y'GWkcc``\Ug'XYj Y`cdYX'U'[i]XY`]bY'hc'\Y`d'mci'k\Yb'gi Va]hh]b['U'Wci fgY'Ugg][ba Ybh'

 $K Y YbWci fU[Y'mci'hc'fYhJ]b'U'WcdmcZYj YfmlUgg][ba Ybhigi Va]hhYX'Zcf'UggYgga YbhZcf'mci f'ck b'fYWcfX Y]h\Yf']b'\UfXWcdmcf'Y'YWfcb]WZcfa " \\$

5```UggYgga Ybhg'a i gh\Uj Y'Ub'UggYgga YbhWcj Yf'g\YYhUhhUW\YX"

7ci fgY Wca d`Yhjcb

7 ci fgY'Wca d`Yhjcb'fYei]fYg'gi Va]gg]cb'cZU```UggYgga Ybh']hYa g": U]`i fY'hc'gi Va]h'U```UggYgga Ybh']hYa g a UmfYgi 'h']b'h\Y'Uk UfX'cZUb'I bgUhjgZUWcfm: U]`i fY'fl : Ł'[fUXY'Zcf'h\Y'7 ci fgY'i b`Ygg'gdYWjU` Wcbg]XYfUhjcb'\Ug'VYYb'gi Va]h\YX'UbX'Uddfcj YX"'D`YUgY'bchYž'U'Wca dYhYbWm\i fX`Y'cZ) \$i ']g'Udd`]YX'hc h\Y'Z]bU``UggYgga Ybh'

@UhY Gi Va]gg]cb cZUb 5gg][ba Ybh

: i ```a Uf_g'Zcf'Ub'Ugg][ba YbhUfY'cb`mdcgg]V'Y'k \Yb'Ub'Ugqj[baw\bh]g'fYWY]j YX'Vmh\Y'Xi Y'XUHY'''

@UhY`gi Va]gg]cb`k,j``behVY*LWwynhXx`UbX`k j```VY`Wcbg]XYfYX`Ug`bc`gi Va]gg]cb"

GdYWJU``7cbg]XXfUhJ@b

Mci 'WUb'Udd`mZcf'gdYWJU``Wcbg]XYfUhJcb'h\fci [\'<u>H\Y'Bi WYi g'Gh XYbh<i V</u>'k\Yb']``bYgg'cf'ch\Yf WJfW a ghUbWrg']bhYfZYfY'k]h\'mci f'UggYgga YbhdYfZcfa UbWr'''G]W_bYggž'a]gUXj Ybh fY'cf'ch\Yf WJfW a ghUbWrg'VYmcbX'mci f'Wcblfc``a Um

- DfYj Ybhmci Zfca Wta d'Yhlb['U'Wti fqY fYei]fYa Ybh
- ? YYd 'mci 'Zfca 'UthYbX]b['Ub'UggYggUV'Y'UWhjj]tm
- Ghcd mci 'gi Va]hh]b['UggYggUV'Y'k cf_ Zcf'U'Wci fgY
- G][b]Z]\WbhmUZY\Wimci f'd\YfZcfa Ub\\Y']b'\Ugg\YggU\Y'k cf_z\VY']h\U'Zcfa U`\Yb\X!cZ\g\Ya \Yg\Yf Y\ Ua]b\Uhcbz\U'\W\Ugg'\Yg\z'\U'\U\cf\Uhcfm\Yf\Zcfa 'cZ Ugg\Ygga \Ybh

K Y'Ug_'h\Uh'mci 'd'YUgY'WcbhUWh\Y'7ci fgY'7cbj Ybcf']a a YX]UhY`mcbW'mci '\Uj Y'Wca d'YhYX'h\Y'gdYW]U`Wcbg]XYfUh]cb'Udd`]WUh]cbžbc'`UhYf'h\Ub'cbY'k YY_'Zfca 'gi Va]gg]cb"

A cfY XYHJ]`g`cb`gdYWJU`Wcbg]XYfUH]cb`WUb`VY Zci bX`Uh`k k k "ghi XYbh'i bgk "YXi "Ui #gdYWJU`!Wcbg]XYfUH]cb

Gh XYbhGi ddcfh

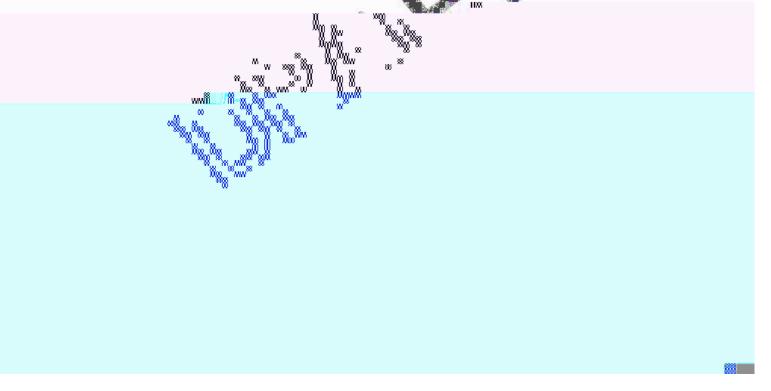
H\Y'I b]j Yfg]lmUbX'h\Y': UW 'mdfcj]XY'U'k]XY'fUb[Y'cZgi ddcfhgYfj]Wyg Zcf'gh XYblgž]bWi X]b[.

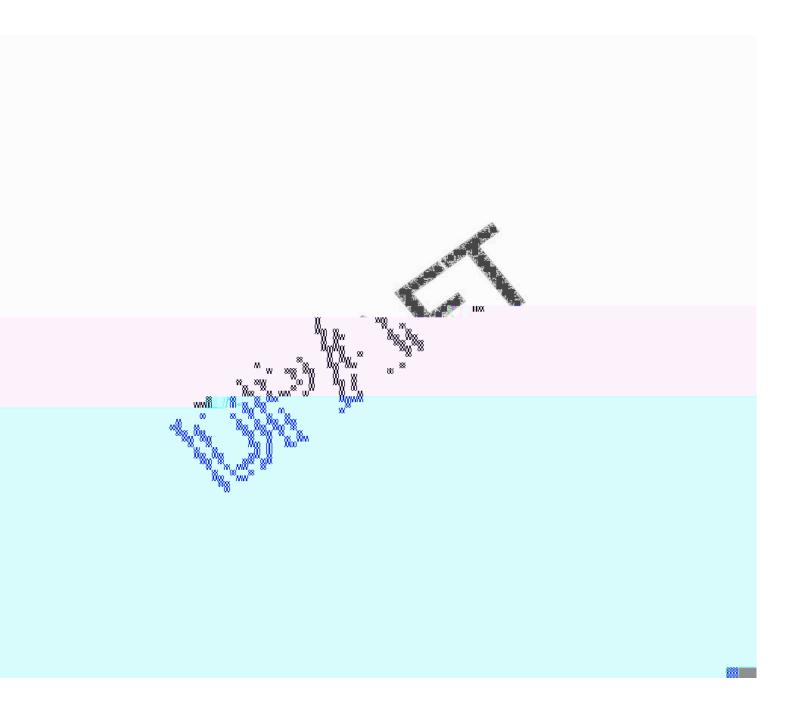
5 WUXYa]W<cbYghmUbX D`U[]Uf]ga

Mci f`YWi fYf'UbX'h\Y'I b]j Yfg]lmk]``YI dYWimci f`gi Va]lhYX'Ugg][ba Ybhg'UfY'lfi `mimci f`ck b'k cf_"'I BGK \Ug'j YfmWYUf'[i]XY`]bYg'cb'k \Uhd`U[]Uf]ga ']g'UbX'\ck 'hc'Uj c]X']h'D`U[]Uf]ga ']g'i g]b['h\Y'k cfXg'cf]XYUg'cZch\Yfg'UbX'dfYgYbh]b['h\Ya 'Ug'mci f`ck b"'D`U[]Uf]ga ']g'U'mdY'cZ]bhY``YWi U`'h\YZh''±i\Wb'hU_Y a Ubm'Zcfa gž'Zca 'XY`]VYfUhY'W\YUh]b['hc'UW]XYbhU``mWcdm]b['Zfca 'U'gci f\W'k]h\ci h'U\Ubck `YX[Ya Ybh' H\Y'I b]j Yfg]lm\Ug'UXcdhYX'Ub'YXi WUh]j Y'UddfcUW\ 'hc'd`U[]Uf]ga 'UbX'\Ug'XYj Y`cdYX'U'fUb[Y'cZ fYgci f\W'g'hc'gi ddcfhghi XYbhg"'5``h\Y'XYhU]`g'cb'd`U[]Uf]ga ž']bWi X]b['gca Y'i gYZ\ `fYgci f\W'gž\Wb'VY Zci bX'Uhk k k "qhi XYbhi' bak "YXi "Ui #d`U[]Uf]ga "

 $5\ensuremath{^{\circ}}\hspace{1.5} \hspace{1.5} \hspace{1.$

⊋mci 'bYYX'gca Y'UXX]h]cbU``gi ddcfhk]h\ 'mci f`k f]h]b['g_]``gž'd`YUgY'WcbhUWh\Y'@YUfb]b['7 YbhfY'cf'j]Yk gca Y'cZh\Y'fYgci fWg'cb'h\Y]f`k YVg]hY. 'k k k "`Wi bgk "YXi "Ui "'' H\Y @YUfb]b['7 YbhfY']g'XYg][bYX'hc'\Y`d mci ']a dfcj Y'mci f'UWUXYa]Wk f]h]b['UbX'Wca a i b]WUh]cb'g_]``d Gca Y'ghi XYbhg'i gY'h\Y'7 YbhfY'gYfj]WYg VYWUi gY'h\YmUfY'Z]bX]b['h\Y]f'Ugg][ba Ybhg'U'W\U``Yb[Yžen\Yfg'VYWU, gY'h\Ymk Ubhhc']a dfcj Y'Ub'U`fYUXm gi WWggZ ``UWUXYa]WdYfZcfa UbW'"







K Y'UW_bck YX[Y'h\Y'6YXY[U``dYcd`Y'k\c'UfY'h\Y'ffUX]h]cbU``W ghcX]Ubg'cZh\Y``UbXg'cb'k\]W\'I BGK ?Ybg]b[hcb'WJa di g']g'`cWJhYX"