

POLS5127

 $7 \]bU'UbX'5g]U!DUW]Z]WGYW f]lm$

HYfa "Hk c" ## "&\$%

7ci fgY[·]Cj Yfj]Yk

GHJZZ:7cbHJWh:8YHJ]`g`

7cbj Ybcfg

B Ua Y		

7ci fgY 8YHJ] g

7 fYX]hDc]bhg *

Gi a a UfmcZh\Y 7ci fgY

 $\begin{array}{l} : \ cf'h cgY']bhYfYghYX']b'hY'Z \ hi \ fY'cZfY[\]cbU``gYW' \ f]m']b'hY'5g]U!DUWZ]WUbX']bhYfbUhJcbU``fY`UhJcbgZ \\ W `hj UhJb['Ub'i bXYfghUbX]b['cZ7 \]bU'UbX']ng'ZcfY][b'dc`]Wn']g']a \ dYfUhJj Y''H\]g'Wci \ fgY'cZZYfg'mci 'h\Y cddcfh b]m'hc 'gh Xm7 \]bU'Ug'U'[`cVU``dck Yf']b'h\Y'a U_]b['': cW g]b['cb'7 \]bU'g'Yj c'j]b['Yb[U[Ya Ybh k]h\ 'h\Y'dcgh 7 c'X'K Uf'fY[]cbU``cfXYfZ'mci 'k]``YI d`cfY'\ck '7 \]bU'g'fffgYfiUg'U'[fYUhdck Yf'cj Yf'h\Y'dUgh h\fY'XYWUXYg'\Ug'dfcZci bX'm]a dUWYX'Vch\ 'fY[]cbU``UbX'[`cVU``gYW'f]m''\Mci 'k]``VY'dfcj]XYX'k]h\ 'h\Y UbU`m']\W'`UbX'h\YcfYh\W'`hcc`g'hc 'Wf]h\W'`mYI Ua]bY'7 \]bYgY'ZcfY][b'dc`]\WnZYVUhYg'cb'k \Yh\Yf'7 \]bU']g'Z bXUa YbHU``mU'ghUh g'ei c'cf'fYj]a]cb]ghdck Yf'' \\ \end{array}$

7 ci fgY @YUfb]b[Ci hWca Yg

- %" 5bUmY'h\Y'7\]bYgY'ZcfY][b'dc`]Wha U_]b['dfcWYgg'UbXž']b'dUff\]W'`Ufz'h\Y'\]ghcf]WU``UbX d\]cgcd\]WU`Zci bXUf\]cbg'cZ7\]bUf\[fy'fY[]cbU``Yb[U[Ya YbhglfUhY[m''
- &" 91 Ua]bY'h\Y'_Ymcddcfhi b]hJYg'UbX'W\U``Yb[Yg'7\]bU'ZJWYg']b']hg'Xca YghJWdc`]hJWJ`'hfUbgZcfa UhJcb UbX'ff[]qYfiUg'U'[`cVU`'UbX'fY[]cbU'`dck Yf"'
- '" 7 f]h]WU``m'Udd`m'±bhYfbUh]cbU``F Y`Uh]cbg'h\Ycfmhc'Yl d`U]b'7\]bUfg'Yl hYfbU``VY\Uj]ci f'UbX h\Y']a d`]WUh]cbg'cZ]hg'[fck]b['dckYf'Zcf'fY[]cbU``gYW f]mi]b'h\Y'5g]U!DUW]ZW'

HYUWX]b[GlfUhY[]Yg

H\]g'Wci fgY'Wcbg]ghg'cZU'hk c!\ci f'gYa]bUf'YUW\'k YY_"'

5g'h\]g']g'U'gYa]bUf'Wci fgYž'ghi XYbhg'k]``'VY'YI dcgYX'hc'U'`YUfb]b['dfcWfgg'h\UhfYei]fYg'dUfh]W]dUh]cb']b'U j Uf]YmicZ]bHY``YWi U``UWfj] Jh]Ygž']bWi X]b['X]gW gg]b['Ugg][bYX'fYUX]b[gž'[fci d'dfYgYbHJh]cbgž'UbX']b!WUgg XYVUhY''5'g\cfh``YWi fY'k]``VY'XY`]j YfYX']b'h\Y'Z]fgh\ci f'hc'dfcj]XY'ghi XYbhg'k]h\'h\Y'bYWfggUfm'[fci bX]b[]b'h\Y'hcd]Whc'VY'YI Ua]bYX'''H\Y'gYWcbX'\ci f'k]``'h\Yb']bj c'j Y'WUgg'ZJWJ]hJh]cb'Vmghi XYbhg'UbX'[fci dX]gW gg]cb'''

H\Y`Wci fgY`Uggi a Yg`ea_ Wdf]cf`_bck `YX[Y`cZ\bhYfbUh]cbU``F Y`Uh]cbg`h\Ycfm'UbX`7\]bYgY`ZcfY][b`dc`]Wf' H\Y`Wci fgY`k]``ž\ck Yj Yfž'VY`gYei YbWX`UbX`XY`]j YfYX`gc`Ug`hc`]bhfcXi WY`ghi XYbhg`hc`Zci bXUh]cbU` WcbWYdhgž'h\Yb`hc`YI hYbX`ghi XYbhgfi_bck `YX[Y`h\fci [\`UX; UbWXX`XYVUhYg`UbX`Ya d]f]WU``a UhYf]U`"

5ggYgga Ybh

5ggYgga YbhHUg_g

5ggYgga Ybh'tUg_	K Y][\h	8iY'8UHY	Gh XYbh@YUfb]b[Ci hWca Yg 5ggYggYX
7`Ugg': UWj]hUhjcb'	&) ı	Bch5dd`]WUV`Y	%ž&
G\cfhi9ggUmi	&) ı	\$%#\$+#&\$%-`\$).\$\$`DA	&Ž
:]bU``9ggUm) \$1	%#\$, #&\$% `\$) .\$\$`DA	%ž&Ž

5ggYgga Ybh'8YhJ]`g

5ggYgga Ybh'% '7`Ugg': UWj`]hUhjcb

GhUfhXUhY. Bch5dd`]WUV`Y

8 YHJ]`g. '%) ! &\$ a]b 'WUgg 'ZJW]`]HUH]cb 'VUgYX `cb 'Ugg][bYX 'fYUX]b[g]b '[fci dg `cZ' 'cf' ('gh XYbhg "5```gh XYbhg k]``fYWY]j Y 'h Y 'gUa Y 'a Uf_" 'Mci 'k]``fYW]Yj Y 'k f]hh b 'ZYYXVUW_'k]h]b '%\$ 'k cf_]b['XUmg `cZmci f'ZJW]`]HUH]cb"

5XX]h]cbU`XYhU]`g.

Mci 'UfY 'fYei]fYX'hc 'gYfj Y'Ug ''Wx]YZX]gW ggUbhg'' cZh\Y'fYUX]b[g']b'h\Y'gYa]bUf'Uh'YUghcbW' Xi f]b['h\Y Wci fgY"'8YdYbX]b['cb'h\Y'g]nY'cZh\Y'WUggžYUWx'k YY_'h\fYY'cf'Zci f'ghi XYbhg'k]```k cf_'Ug'U'hYUa 'UbX YUX'cZh\Y'X]gW gg]cb"'H\Y'dfYgYbhYfg'a i gha U_Y'U'%)!&\$'a]b'dfYgYbhUh]cb'cZh\Y'k YY_'g'fYUX]b[g'UbX ZJW]']hUhY'X]gW gg]cb"'F Uh\Yf'h\Ub'g]a d'mgi a a Uf]n]b['h\Y'fYUX]b[g'i bXYf'ei Ygh]cb'fdfYgi a UV'mU``k]`\Uj Y'fYUX']hZh\Y'X]gW gg]cb'ZJW]']hUhcfg'g\ci 'X'Wf]hJWU`mYb[U[Y'k]h\Y'a UhYf]U``UbX'hYUgY'ci hgdYW]ZJW ei Ygh]cbg'cf'dfcV'Ya g'h\UhUddYUf'k cfh\mcZUhYbh]cb"'5``ghi XYbhg']b'U'[fci d'XY'Y[UhYX'k]h\'h\Y' fYgdcbg]V]]mhc'`YUX'h\Y'X]gW gg]cb'k]``fYWY]j Y'h\Y'gUa Y'a Uf_"

Hi fb]hjb gYhjb[. H\]g]g bchU Hi fb]hjb Ugg][ba Ybh

5ggYgga Ybh& G\cfh9ggUm

GhUfhXUhY. Bch5dd`]WUV`Y

5XX]h]cbU`XYhU]`g.

Mci 'UfY'fYei]fYX'hc'dfYdUfY'U'g\cfnYggUm-'U'"fYUWf]cb'd]YWY"-'cZ%) \$\$'k cfXgž'k \]W\ g\ci `X'dfYgYbh mci f'fYgdcbgY'hcž'UbX'Wf]h]ei Y'cZz'h\Y'a U'cf'Uf[i a Ybhg'Zfca 'U'k YY_'g'fYUX]b[g" Mci 'WUb'gY`YWh\Y'k YY_cZmci f']bhYfYghhc'fYZYWhcbž'Vi hmci f'gY`YWf]cb'g\ci `X'VY`X]ZYfYbhZfca 'h\Y'k YY_cZmci f'WUgg'ZJWj']hUh]cb f5gg][ba Ybh'%±"'H\]g'YggUm]g'Xi Y'cb'>i `m'%" Mci 'k]```fYWY]j Y'k f]hhyb'ZYYXVUW_k]h\]b'%\$'k cf_]b['XUmg"

GhUfhXUhY. Bch5dd`]WUV`Y

8YHJ]`g.

5 https://bxubwww.Fyei]fYaYbhg

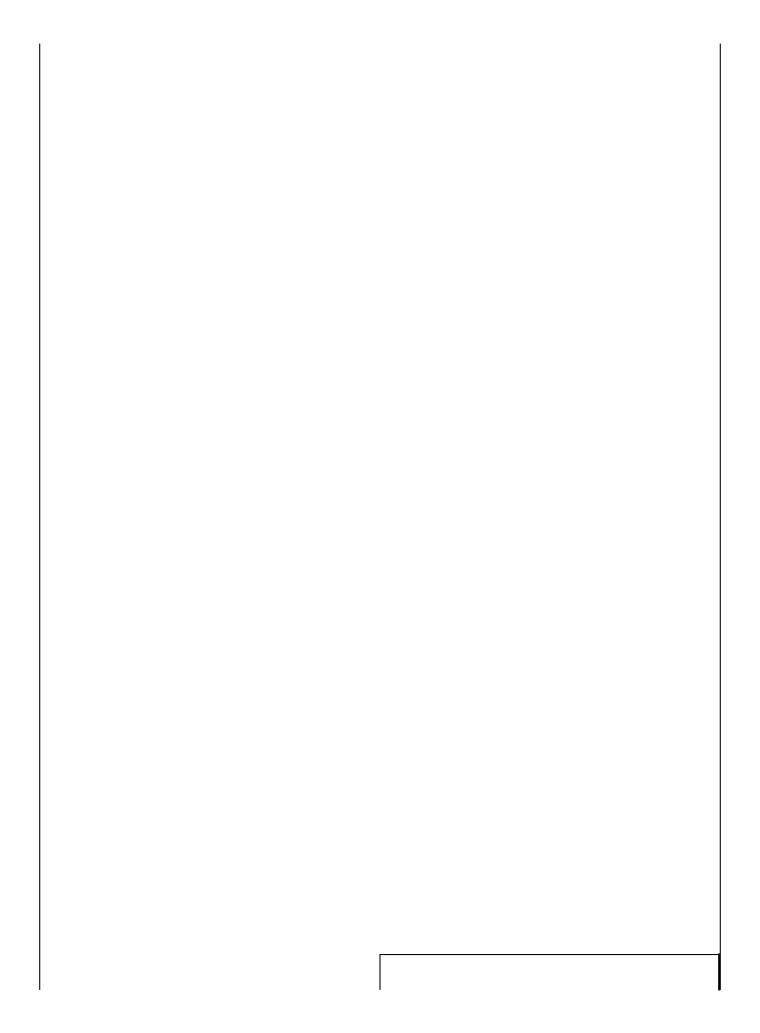
5```gYa]bUfg`UfY`aUbXUlrcfmWUggYg`]b`DC@G) %&+`]b`H&ž`&\$%"

7ci fgY'GWXYXi `Y

J]Yk 'WUgg'ha YHUV'Y

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8 UhY	HmdY	7 cbMbh
K YY_'%'' '>i bY'!'+'>i bY	GYa]bUf	Cj Yfj]Yk / '@c[]gh]Wg'cZ7ci fgY'
		K \Un'UfY'h\Y'a U]b'h\YcfYh]WU`'UddfcUW\Yg'hc'h\Y ghi XmcZ]bhYfbUh]cbU`'gYW f]mmUbX'\ck 'Xc'h\Ym\Y`d i g'i bXYfghUbX'h\Y'f]gY'UbX'VY\Uj]cf'cZ7\]bU3 K \Uh'UfY'h\Y'VUg]WhYbYhg'cZfYU`]ga ž``]VYfU`]bgh]hi h]cbU`]ga ž'UbX'Wcbghfi Wh]j]ga ž'UbX'k\UhXc h\YmhY``i g'UVci h']bhYfghUhY']bhYfUWn]cbg3
K YY_'&.'%\$'>i bY'!'%(>i bY	GYa]bUf	H\Y`F]gY`cZ`7\]bU`UbX`h\Y`±bhYfbUh]cbU``GmghYa. Ghfi WhifU``7\Ub[Y`]b`=F
		Gca Y'Uf[i Y'h\UhXi Y'hc'h\Y'Wcbg]ghYbhf]gY'cZ7\]bU UbX'h\Y'XYW]bY'cZ5a Yf]WUb'i b]dc`Uf'Xca]bUbWY h\Y'k cfX']g'bc!`cb[Yf'i b]dc`Uf''C h\Yfg'VY`]Yj Y'h\Uh h\Y'l G!'YX'i b]dc`Uf]mi]g'gi ghU]bUV'Y'UbX'h\Uh7\]bU WUb'\UfX`m\WUhW\i d'k]h\'h\Y'l b]hY'GHUhYg'' < ck \Ug'h\Y'f]gY'cZ7\]bU'UZZYWYX'h\Y'[`cVU`'dck Yf X]ghf]Vi h]cb3'=g'h\Y'k cfX'bc'`cb[Yf'i b]dc`Uf3'K\Uh XcYg'''dc`Uf]m'''hY``i g'UVci h]bhYfbUh]cbU``fY`Uh]cbg UbX'\ck 'WUb']h\Y'd'i g'Yl d`U]b'h\Y'fYU'!k cfX XYj Y`cda Ybhg3
K YY_" ."%+">i bY"!"&% >i bY	GYa]bUf	H\Y'9jc`ih]cb'cZ'7\]bUg':cfY][b'Dc`]Wm 8cWff]bYg'
		#b th Y "Ughth]ffmmY Ufgž 7 \]bU'g ZcfY][b dc `]\/m\ Ug Yj c `j YX Zfca "_YYd]b['`ck 'dfcZ]Y" i bXYf 8 Yb[L]Ucd]b['hc a cfY 'UggYfh]j Y Zcfa gžgi \(\)\ 'Ug" 7 \]bU XfYUa "'UbX "C bY '6 Y 'hž C bY 'F cUXZ" i bXYf 'L] \\ \ \] bd]b["K \ Uh'UfY th Y a U]b \(\)\ UfU\/Yf]gh]\/Yg \(\) cZ \\ \ \] ZYfYbhghU[Yg cf "Xc\/Yf]bYg" cZ 7 \]bU'g ZcfY][b \\ \] dc `]\/M\R = 7 \]bU'XY `]\/YfUhY `ma cj]b['hck UfXg [fYUhYf 'UggYfh]j YbYgg]b]hg ZcfY][b \] dc `]\/M\NY\Uj]cfz \\ \] cf ']g 7 \]bU'g bYk \\ VY\Uj]cf ']g a YfY `mU fYZY\/Y]cb cZ \\ \] \] \[\] fck]b['dck Yf \(\)WdUVY] \]hYg3 K \\ Uhg\\UdYg \(\)hY \\ \] c`i h]cb cZ 7 \]bU'g ZcfY][b 'dc `]\/M\\UdYg \(\)hY \\ \] ck 'Xc 'h\Y bYk 'ZYUhi fYg cZ7 \]bU'g ZcfY][b 'dc `]\/M\\ \] \[\] g\UdY ']bhYfbUh]cbU`gY\/Y f]m']b '5g]U3



FYgci fWfg

DfYgWf]VYX F Ygci fWYg

5```fY`Yj Ubh'Wci fgY`]bZcfa Uh]cb'UbX'fYei]fYX'fYUX]b[g'UfY'Uj U]`UV`Y'cb'h\Y'A ccX`Y'g]hY'Zcf'h\]g'Wci fgY'' D`YUgY'fY[i `Uf`m'W\YW_Zcf'i dXUhYgž'Ubbci bWYa Ybhgž'UbX'ch\Yf'fY`Yj Ubh'Wci fgY'fY`UhYX']bZcfa Uh]cb'cb A ccX`Y''

FYWca a YbXYX FYgci fWfg

 $\pm 0 \text{Zefa Uhjcb'UVci h'UXX]hjcbU``fYUX]b[g'UbX'fYgci fWfg']g'U`gc'a UXY'Uj U]`UV`Y'cb'h\Y'A ccX`Y'g]hY'Zef'h\]g Wci fgY"$

7ci fgY 9j U`i Uh]cb UbX 8Yj Y`cda Ybh

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

Hi fb]h]b Gi Va]gg]cb

Image: Ybwci bhYf'U'dfcV'Ya k \Yb'UhYa dhJb['hc'gi Va]hmci f'Ugg][ba Ybht\fci [\ 'Hi fb]hJbž'd'YUgY

HY'Yd\cbY'9| hYfbU''Gi ddcfhcb'-',) '' ' ' %cf'Ya U] 'h\Ya 'cb'Y! hYfbU'hY'hgi ddcfh4 i bgk "YXi "Ui '"'Gi ddcfh
\ci fg'UfY', .\$\$Ua '-'\\$.\$\$da 'cb'k YY_XUmg'UbX'-.\$\$Ua '-') .\$\$da 'cb'k YY_YbXg'fl *) 'XUmg'U'mYUfŁ" Image:

UfY'i bUV'Y'hc'gi Va]hmci f'Ugg][ba YbhXi Y'hc'U'ZJi 'hk]h\ 'Hi fb]hJb'mci 'a UmUdd'mZcf'Ub'Y! hYbg]cbž'Vi hmci
a i ghfYhJ]b'mci f'hJW_Yhbi a VYf'Zfca '9! hYfbU''Gi ddcfhfU'cb['k]h\ 'Ubmch\Yf'fY'Yj UbhXcW a YbhgŁ'hc
]bWi XY'Ug'Yj]XYbW' 'hc'gi ddcfhmci f'Y! hYbg]cb'Udd']WUh]cb" Image: Ya U]''9! hYfbU''Gi ddcfhmci 'k]''

Ui hca UhJWJ''mfYW'] Y'U'hJW_Yhbi a VYfž'Vi h]Zmci 'hY'Yd\cbY'mci 'k]'''bYYX'hc'gdYWJZWJ''mUg_'Zcf'cbY"

Hi fb]hJb'U'gc'dfcj]XYg'i dXUhYg'cb'h\Y]f'gmghYa 'ghUh' g'cb'Hk]hYf"

; YbYfU``mž'UggYgga YbhiHug_g'a i ghVY'gi Va]hhYX'Y`YVWfcb]\W)``mj]U'Y]h\Yf'Hi fb]hjb'cf'U'A ccX`Y Ugg][ba Ybh'' =b']bgHJb\W'g'k \YfY'h\]g']g'bchdcgg]V`Yž']hk]``'VY'gHJhYX'cb'mci f'\\circ i fgY'g'A ccX`Y'g]hY'k]h\ U`hYfbUhj Y'gi Va]gg]cb'XYHJ]`g''

: cf']b \mathbb{Z} cfa Uh]cb'cb'\ck 'hc'gi Va]h'Ugg][ba Ybhg'cb`]bY'j]U'A ccX`Y. `\hhdg.##gh XYbh'i bgk "YXi "Ui \mathbb{A} ck! qi Va]h'Ugq][ba Ybha ccX`Y

5 WUXYa | W < cbYqlmUbX D`U[]Uf]qa

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"'\lefi\Wb'hU_Y`a Ubm Zcfa gžZfca `XY`]VYfUhY`W\YUh]b['hc`UVW]XYbhU`mWcdm]b['Zfca `U`gci f\W' k]h\ci hUW_bck `YX[Ya Ybh'

IBGK [fcidg'd'U[]Uf]ga]bhc'h\Y'Zc``ck]b[WUhY[cf]Yg.

7 cdm]b[.'i g]b['h\Y'gUa Y'cf'j Yfmg]a]`Uf'k cfXg'hc'h\Y'cf][]bU`hYl h'cf']XYU'k]h\ci h'UW_bck `YX[]b['h\Y gci fW'cf'i g]b['ei chUh]cb'a Uf_g"'H\]g'U`gc'Udd`]Yg'hc']a U[Ygž'Ufh'UbX'XYg][b'dfcYWhgž'Ug'k Y``'Ug dfYgYbhUh]cbg'k \YfY'gca YcbY'dfYgYbhg'Ubch\Yf'g']XYUg'cf'k cfXg'k]h\ci h'WfYX]h'

⇒ Uddfcdf]UhY 'dUfUd\fUg]b[...7\Ub[]b['U'ZYk 'k cfXg'UbX'd\fUgYg'k \]'Y 'a cghmfYhJ]b]b['h\Y'cf][]bU` ghfi Wh fY 'UbX#cf'dfc[fYgg]cb'cZ]XYUg'cZh\Y'cf][]bU'žUbX']bZcfa Uh]cb'k]h\ci hUW_bck `YX[Ya Ybh'H\]g'U`gc Udd`]Yg']b'dfYgYbhUh]cbg'k \YfY'gca YcbY'dUfUd\fUgYg'Ubch\Yf'g']XYUg'cf'k cfXg'k]h\ci hWfYX]hUbX'hc d]YW]b['hc[Yh\Yf'ei chYg'UbX'dUfUd\fUgYg']bhc'U'bYk 'k \c`Yžk]h\ci hUddfcdf]UhY'fYZYfYbW]b["

7 c``i g]cb.'k cf_jb['k]h\ch\Yfg'Vi hdUgg]b['cZZh\Y'k cf_'Ug'U'dYfgcb'g']bX]j]Xi U``k cf_"'7 c``i g]cb'U`gc]bWi XYg'dfcj]X]b['mci f'k cf_'hc'Ubch\Yf'ghi XYbhVYZcfY'h\Y'Xi Y'XUhYžcf'Zcf'h\Y'di fdcgY'cZh\Ya d`U[]Uf]g]b['UhiUbmh]a Yž'dUm]b['Ubch\Yf'dYfgcb'hc'dYfZcfa 'Ub'UWUXYa]WhUg_ž'ghYU']b['cf'UWei]f]b[Ubch\Yf'dYfgcb'g'UWUXYa]Wk cf_'UbX'Wcdm]b[']hz'cZYf]b['hc'Wca d'YhY'Ubch\Yf'dYfgcb'g'k cf_'cf'gYY_]b[dUma YbhZcf'Wca d'Yh]b['UWUXYa]Wk cf_"

±bUddfcdf]UhY`W]hUh]cb.`7]h]b[ˈgci fWYg'k\]WX`\Uj Y`bchVYYb`fYUXžk]h\ci hUW_bck`YX[]b[`h\Y`″gYWcbXUfm″gci fWY`Zfca 'k\]WX`_bck`YX[Y`cZh\Ya`\Ug'VYYb`cVhU]bYX"

5 WUXYa]W±bZcfa Uhjcb

: cf'YggYbhJU`gh XYbh]bZcfa UhJcb'fY`UhJb['hc.

• fYei YghgʻZcfʻYl hYbg]cb/