

POLS5121

=bhYfbUh]cbU``Cf[Ub]gUh]cbg'UbX'; `cVU``Dc`]h]Vg

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

7 ci fgY Cj Yfj]Yk

GHJZZ:7cbHJWh:8YHJ]`g`

7cbj Ybcfg

B Ua Y	9a U]`	5j U]`UV]`]lm	@cWUh]cb	D\cbY
8YVcfU\^6Uffcg @YU`^: Uf]Ug	XYVcfU\V`Z4 i bgk "YXi "Ui	VmUddc]bha Ybh	A 6 %)	

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7 fYX]hDc]bhg**

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91 Ua]bYg'h\Y'fc`Y'cZ]bhYfbUh]cbU``cf[Ub]gUh]cbg']b'[`cVU``dc`]h]Wg"'91 d`cfYg'h\Y'YZYWNj YbYgg'cZgYW f]hm UffUb[Ya Ybhg'Uhih\Y'fY[]cbU``UbX'[`cVU```Yj Y`g"'5bU`mgYg'h\Y'fc`Yg'cZ]bhYfbUh]cbU``cf[Ub]gUh]cbg']b'[`cVU` YWcbca]W[cj YfbUbWY"'9j U`i UhYg'h\Y'fY`Yj UbWY'cZ]bhYfbUh]cbU``cf[Ub]gUh]cbg']b'dfcj]X]b['gc`i h]cbg'hc h\Y'gcW]U``UbX'\i a Ub]hUf]Ub'W\U`Yb[Yg'ZJW]b['\i a Ub]hm'Uhih\Y'VY[]bb]b['cZh\Y'&%ghW\bh fm'

7ci fgY @YUfb]b[Ci hWca Yg

%" → XYbrjZmubxici hjbyih, YiX]j YfgYiubxiWcbrlygrlyXigrlfi WhifYgicZh, Yijbrlyfbuhjcbuiigrngrlya /

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%" Ub`adYS` [eSf[a` S^Ud[f[cgWcZcbY`cZh\Y`]bhYfbUh]cbU``cf[Ub]gUh]cbg``]ghYX`VY`ck `cf &" Ub`YggUmcb`U`hcd]WUbX`ei Ygh]cb`U[fYYX`hc`Vmmci `UbX`a Y`Vm&, :=i bY

H\Y'YggUma i gh

0

g_]``g`fh\Y`UV]`]hmhc`dfcj]XY`UWW fUhY`UbX`XYhU]`YX`]bZcfa Uh]cb`UVci hmci f`W\cgYb`cf[Ub]gUh]cb\z`cb gmbh\Yg]g`UbX`dYfgi Ug]j Y`Uf[i a Ybhif]b`Vf]b[]b[`hc[Yh\Yf`]XYUg`UbX`XUhU`Zfca `gYj YfU``gci fW\g\z`cb ei U`]mmcZdfYgYbHUh]cb`f]bWi X]b[`UVW fUhY`fYZYfYbW]b[\text{L'UbX`cb`h\Y`WUf]mmcZmci f`k f]h]b["

[fUXY'k]h\]b'hkc'kYY_g'cZgiVa]gg]cb'h\fci[\'h\Y'Ib]jYfg]hmfg'@YUfb]b['AUbU[YaYbhGmghYa'f@AGŁ"

@Yb[h\. '%) \$\$ 'k cfXg

 $8YHU]^*g. "H\Y"U]a "cZh\Y"UbbcHUhYX"V]V"]c[fUd\m]g'hc"YbWcifU[Y'ghiXYbhg'hc"VY[]b'h\]b_]b["UVcihih\Yh\YcfYh]WU"UbX'WcbWfdhiU"ZcibXUh]cbg'cZh\Y]f'fYgYUfW."YggUm'GhiXYbhg'k]""fYgYUfW."UbX"]XYbh]Zm$

 $\label{thm:continuous} \begin{tabular}{ll} Hi & fb & fb & gYM &$

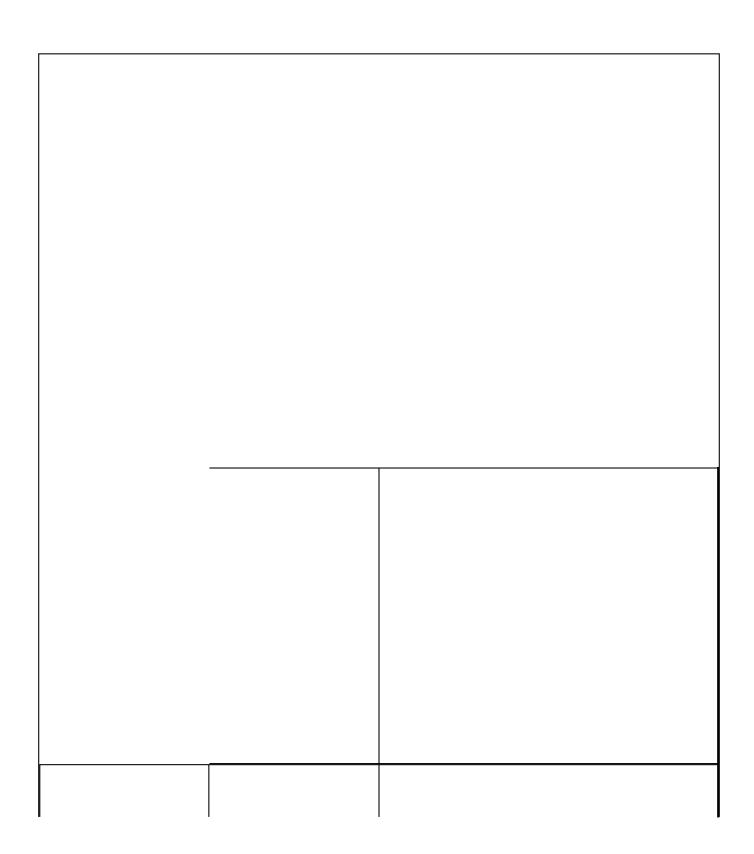
5ggYgga Ybh' . 9ggUm

GHJfhXUhY. Bch5dd`]WUV`Y

@Yb[h\."\$\$\$"k cfXg

8 YHJ]`g. `Ghi XYbhgʻgi Va]h' \$\$\$`k cfX`fYgYUfW.`YggUm'`K f]hhYb`ZYYXVUW_`i g]b[`U`fi Vf]W`dfcj]XYX`k]h\]b kk c`k YY_g`cZgi Va]gg]cb`h\fci [\`h\Y`I b]j Yfg]hnfg`@YUfb]b[`A UbU[Ya Ybh'GmghYa `f@A GŁ"`H\]g`]g`h\Y`Z]bU`UggYgga Ybh']b`h\]g`Wci fgY"

 $\label{thm:continuous} \begin{tabular}{ll} Hi fb]h]b"gYh]b[."H\]g"Ugg][ba Ybh]g"gi Va]hhYX"h\fci [\Thi fb]h]b"UbX"ghi XYbhg"WUb"gYY"Hi fb]h]b"g]a]"Uf]hm fYdcflg" \\ \begin{tabular}{ll} Hi fb]h]b"gYh]b"[."H\]g"Ugg][ba Ybh]g"gi Va]hhYX"h\fci [\Thi fb]h]b"UbX"ghi XYbhg"WUb"gYY"Hi fb]h]b"g]a]"uf]hm fYdcflg" \\ \begin{tabular}{ll} Hi fb]h]b"g"ugg][ba Ybh]g"gi Va]hhYX"h\fci [\Thi fb]h]b"UbX"ghi XYbhg"WUb"gYY"Hi fb]h]b"g]a]"uf]hm fYdcflg" \\ \begin{tabular}{ll} Hi fb]h]b"g"ugg][ba Ybh]g"gi Va]hhYX"h\fci [\Thi fb]h]b"UbX"ghi XYbhg"WUb"gYY"Hi fb]h]b"g]a]"uf]hm fYdcflg" \\ \begin{tabular}{ll} Hi fb]h]b"guyuhan fydcflg" \\ \begin{tabular}{ll} Hi fb]h]b"g]a]"uf]hm fydcflg" \\ \begin{tabular}{ll} Hi fb]h[h]b"g]a]"uf]hm fydcflg" \\ \begin{tabular}{ll} Hi fb]h[h]b"g]a] fydf]hm fydf]hm fydf]hg fyff]hg fyff]hg fydf]hg fydf]hg fydf]hg fyff]hg fyff]h$



	• =g'h\Y'; &\$'U``Y[]h]a UhY'dc`]Wha U_]b[]bgh]hi h]cb'UbX'UWcf'k]h\]b'[`cVU``YWcbca]W
	[cjYfbUbW/3K\m#k\mbch3

FYgci fW/g

DfYgWf]VYX F Ygci fWYg

- H\]g'Wci fgY']g'VUgYX'cb'? Ufbgž'A Uf[UfYhD"ž'A]b[ghž'? UfYb'5"'UbX'Gh]`Ygž'? YbXU```K "'f&\$%) Łž'; fWd Sf[a` S^A dYS` [I Sf[a` e, FZWBa [f[Ue S` V BdaUWeeWe aX9 aTS^9 ahWd S` UWz'' X'YX]h]cb fbci `XYfz'7 C.'@nbbY'F]YbbYfŁ"
- GYY'A ccX'Y'Zcf'a cfY'XYhJ]`g

FYWca a YbXYX FYgci fW/g

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

Ghi XYbhYj U'i Uhji Y'ZYYXVUW_']g'[Uh\YfYX'dYf]cX]\W\`m'' \ \ \ \ Zrfa U``ZYXVUW_'UbX'ZYYXVUW_'gdY\\\Z]\\mathred\]\mathred\]\\mathred\]\mathred\]\\mathred\]\mathred\]\\mathred\]

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

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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'hYhgi 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:

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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]XYbWY'hc'gi ddcfhmci f'Y! hYbg]cb'Udd']WUh]cb" Image: Ya U]''9! hYfbU''Gi ddcfhmci 'k]''

Ui hca UhJWJ'mfYWY] 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''

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

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"

- i bXYfgfUbX mci f'f][\hg'UbX'fYgdcbg]V]`]hJYg'Ug'U'gh XYbhUhl BGK
- VY`Uk UfY`cZd`U[]Uf]ga ž`Wcdmf][\hz'l BGK `Gh XYbh7cXY`cZ7cbXi WhUbX`5VWWdhUV`Y`l gY`cZ I BGK `=\forall H`F Ygci f\W\g`Dc`]\m\m
- VY 'Uk UfY 'cZh\Y 'ghUbXUfXg 'cZVY\Uj]ci f'Yl dYWYX 'cZYj YfmcbY ']b 'h\Y 'l BGK 'Wca a i b]hm
- `cWUHY 'gYfj]WYg'UbX `]bZcfa UH]cb'UVci hI BGK 'UbX'I BGK '@]VfUfm

Gca Y'cZh\YgY'UfYUg'k]``VY'ZJa]`]Uf'hc'mci žch\Yfg'k]``VY'bYk"'; U]b]b['U'gc`]X'i bXYfgHJbX]b['cZU``h\YfY`UhYX'UgdYWng'cZ9@&9'k]``\Y`d'mci 'a U_Y'h\Y'a cghcZmci f'gh X]Yg'UhI BGK "'\\hd.##qi V'YWfi |XYg"`]VfUfm'i bqk "YXi "Ui #\`]qY#JVci hY`]qY

5 WUXYa]W±bZcfa Uhjcb

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

• fYei YghgʻZcfʻYl hYbg]cb/