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&"` <i>=</i> X\ UbX`>	h]ZmUbX`X]gWigg`_Ym[Yc`c[]WU``ZUWicfg`]b`h\Y`]XYbh]Z]WUh]cb jY`cda YbhcZYbYf[mfYgci fWig`]b`gYX]a YbhUfmVUg]bg	D9%" žD9&"%žD9%"&
'"8Y h\fci Ub]b	cbgHfUHY`gHfcb[`cfU``UbX`kf]HHYb`Wcaaib]WUH]cb`g_]``g \`WYUf`YId`UbUH]cbg`cZ[Yc`c[]WU``WcbWYdhg`Uddfcdf]UHY`Zcf 'fX]gW]d`]bUfm`]bXigHfm`UiX]YbWY"	D9' "&

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#X]j]Xi U``HU_Y!\ca Y`Ugg][ba Ybhg`k]h\`Wca a Ybhg`ZYYXVUW_`dfcj]XYX`X]fYWhmhc`h\Y`Ugg][ba Ybh'

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=bX]j]Xi U``a i `h]d`Y!Wkc]WY`ei]nnYg`Wcj Yf]b[`YUWk`cZh\Y`a cXi `Yg`Zcf`h\Y`Wci fgY"`: YYXVUW_`k]``VY`[]j Yb j]U``YWh fYg`UbX`h\fci [\`h\Y`ei]n`]hgY`Z``5`gY`ZYj U`i Uh]cb`ei]n`]g`U`gc`dfcj]XYX`df]cf`hc`h\Y`hcd]Wei]n"

5ggYgga Ybh(. 5dd`]WUh]cb 9l YfW]gYg UbX HYUa Ei]nnYg fl fci dŁ

8i Y`XUHY. K YY_`%žK YY_`&žK YY_` žK YY_`(žK YY_`) žK YY_`+žK YY_`, žK YY_`-žK YY_`%

Ghi XYbhgʻi bXYfhU_YʻUdd`]WUhjcbʻYI YfWjgYgʻWcbg]ghjb[ʻcZgi Va]hhjb[ʻk f]hhYbʻa UhYfjUʻžWca di hYfʻWcXYʻcf cb`]bYʻdfYgYbhUhjcbg"`Ghi XYbhgʻk cf_`]b`[fci dgʻh\fci [\ci hh\Y`hYfa "`K f]hhYbʻgc`i hjcbgʻUbX`a cXY``Ubgk Yfg k]``VY`[]j YbʻUZhYfʻh\Y`gi Va]gg]cb`XYUX`]bY`UbX`dfcj]XYX`]b``YWhi fY`fYWcfX]b[g"

5HYbXUbW/FYei]fYaYbhg

Ghi XYbhgʻUfYʻYI dYWYXʻncʻUhhYbXʻU```WUggYgʻUbXʻhi hcf]U`gʻncʻdUfh]WjdUhYʻ]bʻhYUaʻik cf_žʻWUggʻei]nnYgʻUbX X]gWi gg]cbg"ʻBchYʻh\Uha UbmʻUggYgga YbhgʻUfYʻWcbXi WhYXʻ]b!WUggž`]bWi X]b[ʻ]bX]j]Xi U``ei]nnYgž Udd`]WUh]cbʻYI YfW]gYgʻUbXʻhYUaʻei]nnYg"

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K Y`YbWci fU[Y`mci `hc`fYHJ]b`U`WcdmicZYj YfmUgg][ba Ybhigi Va]hHYX`Zcf`UggYgga YbhZcf`mci f`ck b`fYWcfX Y]h\Yf`]b`\UfXWcdmicf`Y`YWfcb]WZcfa "

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7 ci fgY Wca d`Yh]cb

7 ci fgY'Wca d`Yh]cb'fYei]fYg'gi Va]gg]cb'cZU```UggYgga Ybh']hYa g"': U]`i fY'hc'gi Va]h'U```UggYgga Ybh']hYa g a Um'fYgi `h']b'h\Y'Uk UfX'cZUb'I bgUh]gZUWcfm: U]`i fY'fI : ½[fUXY'Zcf'h\Y'7 ci fgY'i b`Ygg'gdYW]U` Wcbg]XYfUh]cb'\Ug'VYYb'gi Va]hHYX'UbX'Uddfcj YX"

Gh XYbhGi ddcfh

H\Y'I b]j Yfg]mUbX'h\Y': UW `mdfcj]XY'U'k]XY'fUb[Y'cZgi ddcfhgYfj]Wg'Zcf'gh XYbhgž']bWi X]b[.

- @VfUfmihfU]b]b['UbX'gi ddcfhigYfj]Wfg'! '<u>k k k "`]VfUfm'i bgk "YXi "Ui</u>
- 5WUXYa]WG_]``g`Gi ddcfh! <u>`\hdg.#k k k "gh XYbh'i bgk "YXi "Ui #g_]``g</u>
- DgmWkc`c[miUbX`K Y``bYgg`! <u>k k k "Wci bgY``]b["i bgk "YXi "Ui</u>

9ei]HUV`Y`@YUfb]b[`GYfj]WYg`U]a g`hc`dfcj]XY`U```gh`XYbhg`k]h\`U`ZYY`UbX`WcbZ]XYbh]U``gYfj]WY`h\Uh dfcj]XYg`dfUWh]WU``gi ddcfhhc`Ybgi fY`h\Uhmci f`\YU`h\`WcbX]h]cb`XcYgbfhiUXj YfgY`mUZYWhmci f`ghi X]Yg"` <u>\hhdg.#bh`XYbh'i bgk "YXi "Ui #Y`g</u>

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

Mci f``YWi fYf`UbX`h\Y`I b]j Yfg]Imik]``YI dYWinci f`gi Va]IhYX`Ugg][ba Yblg`UfY`Hi`minci 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`nci f`ck b"`D`U[]Uf]ga `]g`U`mdY`cZ]bH``YWi U``h\YZh'' #i`WUb`HU_Y a UbmZcfa gž`Zīca `XY`]VYfUHY`W\YUh]b[`hc`UVW]XYbHU``mVcdm]b[`Zīca `U`gci fWY`k]h\ci hUW_bck `YX[Ya Ybh' H\Y`I b]j Yfg]Imi\Ug`UXcdhYX`Ub`YXi WUh]j Y`UddfcUV\`hc`d`U[]Uf]ga `UbX`\Ug`XYj Y`cdYX`U`fUb[Y`cZ fYgci fWYg`hc`gi ddcfhigh XYbhg''`5```h\Y`XYHJ`g`cb`d`U[]Uf]ga ž`]bWi X]b[`gca Y`i gYZ ``fYgci fWYgž`WUb`VY Zci bX`Uhi<u>k k k "gh XYbh'i bgk "YXi "Ui #d`U[]Uf]ga</u>

5WUXYa]W=bZcfaUh]cb

7 ci fgY FYgi `hg

: cf^{*}XYHJ]`gʻcbʻI BGK ^{*}UggYgga Ybhdc`]Whž'd`YUgY`j]g]h<u>'k k k "gh XYbh'i bgk "YXi "Ui #UggYgga Ybh</u>

=b`gcaY`]bgHJbWYg`mcifZ]bU``WcifgY`fYgi`haUmVY`k]h\\Y`X`UbX`bchfY`YUgYX`cb`h\Y`IBGK``d`UbbYX`XUhY" H\]g`]g`]bX]WJhYX`VmU`WcifgY`[fUXY`fYgi`hcZY]h\Yf.

- @9'-`]bX]WUhYg'mci `\UjY'bchWca d`YhYX'cbY'cf'a cfY']hYa g`cZUggYgga Ybh/cf
- K 8 --]bX]WUhYg'h\YfY']g'Ub']ggi Y'k]h\ cbY cf'a cfY Ugg][ba Ybh/cf
- K 7 '--'k \]WX ']bX]WUHYg mci '\Uj Y 'Udd`]YX 'Zcf'GdYW]U` '7 cbg]XYfUH]cb'Xi Y 'hc']` bYgg'cf'a]gUXj YbH fY UbX 'h\Y Wci fgY'fYgi 'hg'\Uj Y 'bchVYYb 'Z]bU`]gYX"

=0`Y]h\Yf`YjYbh]hk ci `X`VY`mci f`fYgdcbg]V]`]mhc WcbhUWh\Y`7 ci fgY`7 cbjYbYf`Ug`gccb`Ug`dfUWf]WUV`Y`Vi h bc``UhYf`h\Ub`ZjYf) EXUmg`UZhYf`fY`YUgY`cZh\Y`Wci fgY`fYgi `h''=Zmci `Xcb'hWcbhUWh\Y`WcbjYbYf`cb`h]a Yž mci `a UmVY`fYei]fYX`hc`fY!gi Va]hUb`Ugg][ba Ybhcf`fY!g]hh\Y`ZjbU``YI Ua `UbX`a UmfYgi `h`]b`mci `ZJ]`]b[`h\Y Wci fgY"'Nci `k ci `X`U`gc`\Uj Y`U`B 7`fWci fgY`bchWca d`YhYXE'a Uf_`cb`mci f`hfUbgWf]dhUbX`k ci `X`bYYX`hc`fY! Ybfc```]b`h\Y`Wci fgY"

Ghi Xm]b['U'Wci fgY']b'h\Y'GW\cc``cZA]bYfU`g'UbX'9bYf[mFYgci fWfg 9b[]bYYf]b['Uh'I BGK

Ghi XYbhF Ygci fWg

H\]g`Yb[]bYYf]b[`<u>gh XYbhfYgci fWg</u>`gYWjcb`Wc``UhYg`i gYZ ``UXj]WY`UbX`]bZcfa Uhjcb`hc`Ybgi fY`mci 'fY`UV`Y hc`ZcW g`cb`mci f`gh X]Yg"``

7ca di h]b[FYgci fW/g UbX = bh/fbYh5WW/gg FYei]fYa Ybhg

I BGK `A]bYfU`gʻUbX`9bYf[mF Ygci fWfgʻ9b[]bYYf]b[`dfcj]XYgʻV`YbXYX``YUfb]b[`i g]b[`h\Y`cb!`]bY`A ccX`Y @A G`ff@YUfb]b[`A UbU[Ya YbhGmghYa Ł"`5`gc`gYY`!`HfUbg]h]cb]b[`hc`Cb`]bY @YUfb]b[..`<u>k k k "Wcj]X%-ghi Xmcb`]bY"i bgk "YXi "Ui</u>

+i]g'YggYbh]U``h\Uhmci `\Uj Y`UVWYgg'hc`U`D7`cf`bchYVcc_`Wca di hYf"A cV]`Y`XYj]WYg'gi W\`Ug'ga Ufhid\cbYg UbX`HUV`Yhg'a UmWca d`]a Ybh`YUfb]b[ž'Vi hUVWYgg'hc`U`D7`cf`bchYVcc_`Wca di hYf`]g'U`gc`fYei]fYX"`BchY h\Uhigca Y`gdYW]U`]ghYb[]bYYf]b[`gcZh\UfY`]g`bchUj U]`UV`Y`Zcf`A UWWca di hYfg"

- A]b]b['9b[]bYYf]b['Gh XYbhg. 'CA 6'; (,
- DYlfc Yi a '9b[]bYYf]b['Gh XYbhg. H9H6 @ ' (/ @ '')

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• VfcUXVUbX`WcbbYWfjcb`f&) * `_V]h#gYWcf`ZJghYfŁ

• UV]`]hmihc`j`]Yk`ghfYUa]b[`j`]XYc`f\][\`cf``ck`XYZ]b]h]cb`I_BGK``HJ`cdh]cbgŁ

A cfY`]bZcfa Uh]cb`UVci higmghYa `fYei]fYa Ybhg`]g`Uj U]`UV`Y Uh<u>k k k "ghi XYbh'i bgk "YXi "Ui #a ccX`Y!gmghYa !fYei]fYa Ybhg</u>

$5WW gg]b[^7cifgYAUW f]UgH fci[AccXY$

7 ci fgY'ci h]bYgžgi ddcfha UhYf]U`gʻUfY'i d`cUXYX'hc'A ccX`Yž'h\Y'i b]j Yfg]mighUbXUfX'@YUfb]b[A UbU[Ya YbhGmghYa 'f@A GŁ'' =b`UXX]h]cbžcb!`]bY'Ugg][ba Ybhigi Va]gg]cbg'UfY'a UXY'i g]b['h\Y Ugg][ba YbhXfcdVcI 'ZJVJ]hmdfcj]XYX']b'A ccX`Y'' 5``Ybfc``YX'ghi XYbhg'UfY'Ui hca Uh]WU``mi]bWi XYX']b A ccX`Y'Zcf'YUW\'Wci fgY''Hc'UWWgg'h\YgY'XcW a Ybhg'UbX'ch\Yf'Wci fgY'fYgci fWfgžd`YUgY'j]g]h' <u>k k k "a ccX`Y'hY`h'i bgk "YXi "Ui</u>

FZ[e UagdeWagf?[`WeWfe agf VWeUd[bf[a` aXU'SeeWe Sf fZWVSfWfZW5 agdeWA gf?]`W[e bgT?[eZWVžFZW `SfgdWaXU'SeeWe _ Sk UZS`YWVgd[`Y fZWFWd_ SXWdfZW5 agdeWA gf?]`W[e bgT?[eZWVž? aaV WeZag*V TW Ua` eg fWW Xad fZWgb fa VSfWU'See VWeUd[bf[a` ež ;XfZWdW[e S` k [`Ua` e[efW Uk [` fZWVWeUd[bf[a` aX SUf[h[f[We TWfi VWV fZWG` [hWde[fk f[_ WfST*WS` V fZW5 agdeWA gf?]`W/Se gbVSfWW [` ? aaV Wfi fZW VWeUd[bf[a` [` fZW5 agdeWA gf?]`W? aaV WSbb?[Wež

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5 hhļa Ygžih Y GWL cc``cfimci fi Wei fgY Webj Ybefgia UmbYYX he WebhUWhimei i UV ci himei fi Wei fgY 'efimei f Ybfe`a Ybh'i Mei fi Wei fgY Webj Ybefgik]```i gY hLY Ya U]``Z bWh]ebik]hL]biA ccX`Y iefik Yik]``WebhUWhimei ieb mei fi4 ghi XYbh'i bgk "YXi "Ui iYa U]`UXXfYgg"

K Y'i bXYfgHUbX'h\Uhimci 'a Um\Uj Y'Ub'YI]gh]b['Ya U]`'UWWci bh'UbX'k ci 'X'dfYZYf'Zcf'mci f'I BGK 'Ya U]`g'hc VY'fYX]fYWhYX'hc'mci f'dfYZYffYX'UWWci bh''D'YUgY'gYY']bghfi Wh]cbg'cb'\ck 'hc'fYX]fYWhimci f'I BGK Ya U]`g.''<u>~<ck 'WUb'=Zcfk UfX'a m'Ya U]`g'hc'Ubch\Yf'UVWci bh3″</u>

< ck Mci 7Ub 7cbHJWhIg

K Y`UfY`U`k Umg`fYUXmhc`Ugg]ghimci`k]h\`mcif`]bei]f]Yg"`Hc`YbgifY`mcif`eiYgh]cb`]g`X]fYWhYX`hc`h\Y`WcffYWh dYfgcbž'd`YUgY`igY`h\Y`YaU]``UXXfYgg`VY`ck`Zcf.

 9bfc`a Ybhcf`ch\Yf`UXa]b'ei Ygh]cbg`fY[UfX]b['mci f`dfc[fUa .' \htdg.## bgk]bg][\hta]\#cgcZt\#a dcfhU`g"\#ca #\YV!Zcfa g# 7F=7CG`Dfcj]XYf`7cXY.`\$\$\$-,;

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 $\label{eq:constraint} \begin{array}{l} K = Y^{UW}bck^{Y}X[-Y^{H}Y^{G}YXY[-U^{H}Y^{H}X]h]cbU^{W}ghcX]Ubg^{C}Zh^{Y}^{U}bXg^{C}b^{K}^{W}I=BGK^{W}ghcX]Ubg^{C}Zh^{Y}^{W}UbXg^{C}b^{K}^{W}I=BGK^{W}ghcX]Ubg^{C}Zh^{Y}^{W}UbXg^{C}b^{K}^{W}I=BGK^{W}ghcX]Ubg^{C}Zh^{Y}^{W}UbXg^{C}b^{K}^{W}I=BGK^{W}ghcX]Ubg^{C}Zh^{Y}^{W}UbXg^{C}b^{K}^{W}I=BGK^{W}ghcX]Ubg^{C}Zh^{Y}^{W}UbXg^{C}b^{K}^{W}I=BGK^{W}ghcX]Ubg^{C}Zh^{Y}^{W}UbXg^{C}b^{K}^{W}I=BGK^{W}ghcX}I=BGK^{W}gh$

5ddYbX]I. '9b[]bYYfg'5ighfU`]U'f195ŁDfcZYgg]cbU`'9b[]bYYf'7cadYhYbWm GHJbXUfX

Dfc[fUa +bhybXYX @YUfb]b[Cihwca Yq ? bck `YX[Y 'UbX'q_]``'VUqY D9%"%7cadfY\Ybq]iYžh\YcfmVUqYXibXYfqHUbX]b[cZh\YibXYfd]bb]b[bUhifU`UbX d/mg]WU`:gW]YbWYg`UbX`h\Y`Yb[]bYYf]b[`Z bXUa YbHU`g`Udd`]WUV`Y`hc`h\Y`Yb[]bYYf]b[`X]gW]d`]bY D9%"& 7 cbW/dhiU`i bXYfqHUbX]b[cZh\Y`a Uh\Ya Uh\Wažbi a Yf]WU`UbU`mg]qžqHUh|qh\WažUbX Weadi hYf'UbX']bZcfaUh]cb'gW]YbWYg'k\]WX'i bXYfd]b'h\Y'Yb[]bYYf]b['X]gW[d`]bY D9%" + + XYdh i bXYfqHbX]b[cZqdYWU`]qhVcX]YqcZ bck YX[Yk]h bhY'Yb[]bYYf]b[X]qWd`]bY D9%"('8]qWFfba YbhcZ_bck YX[YXY]Ycda YbhUbXfYqYUfWXX]fYWfcbg'k]h.jb'h.Y Yb[]bYYf]b[`X]gWJd`]bY D9%") ? bck `YX[Y`cZYb[]bYYf]b[`XYg][b`dfUW]WY`UbX`WcbhYl hi U``ZJW/cfg`]a dUWf]b[`h\Y Yb[]bYYf]b['X]qW[d`]bY D9%"* I bXYfqHJbX]b[cZh\Y'qWcdYždf]bW]dYgžbcfa gžUWVci bHJV]]]h]Yg'UbX'Vci bXg'cZ qi qHU]bUV`Y`Yb[]bYYf]b[`dfUWfWY`]b`H\Y`qdYW[Z]WX]qW[d`]bY 9b[]bYYf]b['Udd`]WUh]cb'UV]`]m D9&"%5dd`]WUhjcb`cZYghUV`]g\YXYb[]bYYf]b[`a Yh\cXg`hc`Wca d`YI_Yb[]bYYf]b[`dfcV`Ya qc`i]b[D9&"&: `i YbhUdd`]WUhcb'cZYb[]bYYf]b['hYWkb]ei Ygžhcc`g'UbX'fYgci fWfg D9&" 5dd`]WUhjcb`cZgmghYa UhjWYb[]bYYf]b[`gmbh\Yg]g`UbX`XYg][b`dfcWYggYg D9&"('5dd`]WUHcb'cZgmghYaUHWUddfcUWXYg'hc'h\Y'WcbXiWiUbX'aUbU[YaYbhcZYb[]bYYf]b[dfc Y₩q DfcZYgg]cbU`UbX dYfgcbU`Uhf]Vi hYg D9' "%'9h\]WU``WcbXi WiUbX'dfcZygg]cbU``UVWci bHUV]`]hm D9' "&'9ZYW)j Y'cfU`'UbX'k f]HYb'Wca a i b]WUh]cb']b'dfcZygq]cbU`'UbX'`UmXca U]bg D9' "' 7 fYUhi Yžibbci Uhi YUbXidfc!UWi YXYa YUbci f D9' "(DfcZygg]cbU`i gY'UbX'a UbU[Ya YbhcZ]bZcfa Uhcb D9' ") CfXYfma UbU[Ya YbhcZgYZzUbX dfcZygq]cbU`WcbXi Wh D9' "* 9ZYWAJ Y HYUa 'a Ya VYfg\]d UbX HYUa 'YUXYfg\]d