

ARTS2692

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

7ci fgY[·]Cj Yfj]Yk

GhJZZ 7 cbhJWh 8 YhJ] `g

7cbj Ybcfg

| B Ua Y | 9a U]` | 5j U]`UV]`] m | @cWUh]cb | D\cbY |
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7ci fgY 8YW] g

7 fYX]hDc]bhg**

Giaa UfmcZh\Y 7ci fgY

H\]g`Wci fgY`ZcW gYg`cb`gmbHUI — hfUX]h]cbU``mXYZ]bYX`Ug`h\Y`ghi XmcZh\Y`[fUa a Uh]WU``fY`Uh]cb`VYhk YYb k cfXg`k]h\]b`h\Y`gYbhYbW\"`H\Y`Wci fgY`UddfcUW\Yg`h\Y`ghi XmcZgmbHUI `Zfca `h\Y`dYfgdYWh]j Y`cZ [YbYfUh]j Y``]b[i]gh]Wg`ZfUa Yh\cXc`c[]WU``Zci bXUh]cbg`cZh\Y`[YbYfUh]j Y``]b[i]gh]Wg`ZfUa Yh\cf_ k]h\`dUfh]W``Uf`fYZYfYbWV`hc`h\Y`d`UWV`cZgmbHUI `]b`h\Y`ghi XmcZh\Y`\i a Ub``Ub[i U[Y`ZUW`hm'H\Y`Wci fgY]bj Ygh][UhYg`U'bi a VYf`cZ_Ymh\YcfYh]WU``Wcbghfi Whg`h\UhUhHYa dhhc`UWWci bhZcf`Vch\`i b]j YfgU``UbX `Ub[i U[Y!gdYW]ZJWgmbHUW]Wd\Ybca YbU"`Mci `k]```\Uj Y`h\Y`cddcfhi b]hmhc`UbU`mgY`XUhU`Zfca `9b[`]g\`UbX U'k]XY`fUb[Y`cZX]ZZYfYbh`Ub[i U[Yg"

5ggYgga Ybh

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| 5ggYgga Ybh'hUg_ | K Y][\h | 8iY'8UhY | Gh XYbh@YUfb]b[Ci hWca Ygʻ5ggYggYX |
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| ±b!WUgg HYgh | ' \$1 | % #\$+#&\$&%`\$&.\$\$`DA | %ž [*] (|
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5ggYgga Ybh8YlU]`g

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G\cfhYl YfW]gYg'hc'VY'Wca d'YhYX'k YY_`mUbX'gi Va]hhYX'cb`]bY"

#!\WUgg^[\text{YbYfU}^cfU^\UbX^k f]\text{htyb}^\text{ZYYXVUW_\text{}}]g^\text{dfcj}]XYX\"

Hi fb]hb gYhb[. H\]g]g bchU Hi fb]hb Ugg][ba Ybh

5ggYgga Ybh& ±9!WUgg HYgh

8 YW] g.

*\$ a]bi hY hYghWcj Yf]b[h\Y WcbhYbhcZ`YWi fYg UbX h hcf]U`g"

; YbYfU``UbX`]bX]j]Xi U``k f]hYb`ZYYXVUW_`]g`dfcj]XYX"

 $\label{thm:limit} \begin{tabular}{ll} Hi & fb \end{tabular} $$ Hi & fb \end{tabular} $$ h' \end{tabular} $$ I' Hi & fb \end{tabular} $$ h' \end{tabular}$

5ggYgga Ybh' . :]bU` 9l Ua

8 YHJ] g.

 $\$ \f'Y| Ua 'Wcj Yf]b['U``h\Y 'a U'cf'hcd]\Mg'cZh\Y 'Wci fgY"

H\]g`]g`h\Y`Z|bU``UggYgga YbhZcf`UhYbXUbWY`di fdcgYg"

5 http://bxubww.F.Yei]fYa Ybhg

7ci fgY'GWXYXi `Y

J]Yk Wugg'ha Yhuv'y

H]a YHJV`Y

| 8 UhY | HmdY | 7 c bhY bh | | |
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| K YY_'%'' %'A Um!'('>i bY | @YWh fY | ±blfcXi WjcbžDUfhg`cZGdYYW\" | | |
| | | 01 V4 MaV a 'a b ' b Ha V; MHa b * D1 H m 'a 7 C d V V M " | | |
| | Hi hcf]U` | 91 YfW]gYgʻcbʻ≢btfcXi Wf]cbžDUftgʻcZGdYYW\" | | |
| | | D`YUgY'bchY'h\UhZ fh\Yf'XYHU]`g'UbX']bZcfa Uh]cb]bWi X]b['h\Y'fYUX]b['`]ghZcf'YUW\'k YY_'UbX]bghi Wi]cb'Zcf'h hcf]U`'HUg_gž'WUgg#cb`]bY'UWh]j]h]Yg UbX'YI dYWhUh]cb'k]``'VY'Uj U]`UV'Y'cb'A ccX'Y" @YWi fY#i hcf]U`'hcd]Wg'UbX'UggYgga YbhgW\YXi 'Y UfY'gi V'YWh'hc'W\Ub[Y"'Mci 'a i ghWcbgi `h'A ccX'Y'Zcf fY[i `Uf'i dXUhYg" | | |
| K YY_'&.'+'>i bY'!''%% >i bY | @YWi fY | 7 cbghhi YbWhžGhfi Whi fU`FY`Uhjcbg" | | |
| | Hi hcf]U` | 91 YfWjgYgʻcbʻ7 cbghjhi YbWhžʻGhfi Whi fU``F Y`Uhjcbg" | | |
| K YY_'' .'%) | @YWnifY | 6]bX]b['H\Ycfmž'L!VUf'H\Ycfmf\te" | | |
| >i bY | Hi hcf]U` | 9 YfW]gYg'cb'6]bX]b['H\Ycfmž'L!VUf'H\Ycfmif\ | | |
| Hi Yt Yf]U(`.`&%'>i bY'!`&&%' | | % 0 % 0 | | |
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| | Hi hcf]U` | 9l YfW]gYgʻcbʻK <ʻA cj Ya Ybhfl⊭ž'@cWJ`]hm 7 cbghfU]bhgʻfl£ʻ |
|--------------------------------------|-----------|---|
| K YY_'%\$.^&'5i [i gh!'* 5i [i gh | | @cWU`]lmi7 cbglrfU]lblgʻfl⊨tžʻ5 il b]ZJYX H\YcfmcZ A cj Ya Ybli' |
| | <u> </u> | 9lYfW]gYgʻcbʻ@cWU`]mm7cbghfU]bhgʻf⊫±ž5ʻlb]Z]YX H\YcfmcZAcjYaYbh' |

F Ygci fWYg

DfYgWf]VYX F Ygci fWYg

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

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

Image: Ybwei bhyfu'dfcv'ya k \yb'uhhya dhjb['hc'gi va]hmci f'Ugg][ba Ybhh\fci [\ 'Hi fb]h]bž'd'YUgY

Hy'Yd\cby'9| hy'fbu''Gi ddcfhcb'-',) '' ' ' %cf'Ya U]''h\Ya 'cb'Y! hy'fbu'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'mYUft"'=Z'mci
UfY'i bUV'Y'hc'gi va]hmci f'Ugg][ba YbhXi Y'hc'U'ZJi 'hk]h\ 'Hi fb]h]b'mci 'a Um'Udd'mZcf'Ub'Y! hy'bg]cbž'Vi hmci
a i ghfYhJ]b'mci f'h]W_Yhbi a VYf'Zfca '9! hy'fbU''Gi ddcfhfU'cb['k]h\ 'Ubmch\Yf'fy'Yj UbhXcW a Ybhgt'hc
]bWi XY'Ug'Yj]XYbW' 'hc'gi ddcfhmci f'Y! hy'bg]cb'Udd']WUh]cb"'=Zmci 'Ya U]''9! hy'fbU''Gi ddcfhmci 'k]'`
Ui hca Uh]WJ'`mfYW']j Y'U'h]W_Yhbi a VYfZ'Vi h]Zmci 'hY'Yd\cbY'mci 'k]``bYYX'hc'gdYW]Z]WJ'`mUg_'Zcf'cbY''
Hi fb]h]b'U'gc'dfcj]XYg'i dXUhy'g'cb'h\Y]f'gmghYa 'ghUh' g'cb'Hk]hyf''

; YbYfU`mž'UggYgga YbhiHug_g'a i ghVY'gi Va]hhYX'Y`YVWfcb]\WJ``mij]U'Y]h\Yf'Hi fb]h]b'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`hYfbUh]j Y'gi Va]gg]cb'XYHJ]`g"

cfi]bZcfa Uhjcbicbi\ckihcigi Va]hUgg][ba Ybhgicbi]bYij]UiA ccXiY.i\hdg.#gh XYbhi bgk "YXi "Ui #\ck! gi Va]hUgg][ba Ybha ccXiY

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

D`U[]Uf]ga i]gii g]b[ih\Yik cfXgicfi]XYUgicZch\YfgiUbXidfYgYbh]b[ih\Ya iUgimci fick b"i=hWJbihU_Yia Ubm Zcfa gžZfca iXYi]VYfUhYiWXYUh]b[ihciUWW]XYbhU`mWcdm]b[iZfca iUigci fWYik]h\ci hiUW_bck iYX[Ya Ybh'

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

• i bXYfgHJbX'mci f'f][\hg'UbX'fYgdcbg]V]`]h]Yg'Ug'U'gh XYbh'Uhil BGK

5 WUXYa]W + DZcfa Uhjcb

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

- fYei Yghg Zcf Yl hYbg]cb/
- `UhY 'gi Va]gg]cbg '[i]XY`]bYg/
- fYj]Yk 'cZa Uf_g/
- I BGK < YU`h\ UbX GUZYmdc`]W[Yg/
- YI Ua]bUh]cb dfcW/Xi fYg/
- gdYWJU``Wcbg]XYfUHjcb']b'H\Y'Yj YbhcZ]``bYgg'cf'a]gUXj Ybh fY/
- gh XYbhYei]hmUbX'X]gUV]`]hm/
- UbX'ch\Yf'YggYbhJU`'UWUXYa]W]bZcfa UhJcbž'gYY