

ARTS4249

H\Y'<ia Ub]h]Ygž'h\Yb'UbX'bck

HYfa 'C bY''##'&\$%

7ci fgY[·]Cj Yfj]Yk

GHJZZ:7cbHJWh:8YHJ]`g`

'7cbj Ybcfg'

7 ci fgY 8 YHJ]`g 7 fYX]hDc]bhg * Gi a a UfmcZh\Y 7 ci fgY

5ggYgga Ybh

5ggYgga Ybh'HUg_g'

5ggYgga Ybh'HJg_	K Y][\h	8i Y'8UHY	Gh XYbh@YUfb]b[Ci hWca Yg 5ggYggYX
@YUfb]b['DcfhZc`]c') \$1	, '5df]``&\$%-ž'%*.\$\$	% <u>ž</u> & <u>ž</u> (
9ggUmi) \$1	%'>i `m'&\$% ž'%*.\$\$	%ž&Ž Ž(

5ggYgga Ybh'8YHJ]`g

5ggYgga Ybh'% '@YUfb]b['DcfhZc`]c

GhUfhXUhY. Bch5dd`]WUV`Y

@Yb[h\.'(\$\$\$'k cfXg

8YHJ]`g. `Ghi XYbhg`XcW a Ybhh\Y]f`fYgdcbgYg`hc`UbX`UbU`mg]g`cZfYUX]b[`a UhYf]U`g`X]gW ggYX`]b`h\Y`Z]fgh* k YY_g`cZh\Y`Wci fgY"`Ghi XYbha i ghgi Va]h, \$\$`k cfX`fYgdcbgYg`hc`fYUX]b[g`VYZcfY`WUgg`]b`(`cZ*`k YY_g" H\cgY`fYgdcbgYg`k]``VY`fYj]gYX`UbX`fYgi Va]h\X`Uhh\Y`YbX`cZk YY_`, `k]h\`Ub`UXX]h]cbU``, \$\$`k cfX

5 h Yb X Ub WY F Yei] f Ya Yb hg

 $5\,\text{thY}\,b\,\text{XUbW}\,\text{`cZ'YW}\,\text{if}\,\,\text{fYg'UbX'}\,\text{h}\,\,\text{hcf]}\,\text{U'g']}\,\text{g'a}\,\,\text{UbXUhcfm']}\,\text{b'h}\,\text{lg'Wc}\,\text{if}\,\,\text{fgY'''}\,\text{l}\,\,\text{bYl}\,\,\text{W}\,\,\text{gYX'UVgbYW}\,\,\text{Zfca''}\,\text{a}\,\,\text{cfY'}\,\text{h}\,\text{Ub}\,\,\text{\&$1-cZ'YW}\,\,\text{fYg'UbX'}\,\text{hcf]}\,\text{U'g'}\,\text{k}\,\,\text{l}'\,\text{``fYgi''}\,\text{h}\,\text{lb'}\,\text{h}\,\text{Y'Uk}\,\,\text{UfX'U'ZU]''}\,\text{[fUXY''']}$

 $\pm 0.74 \text{Win fYg'UbX'hin hcf]U'g'mci'k]^* \cdot 100 \text{Win fYg'UbX'hin hcf}^* \cdot 100 \text{Win fYg'UbX'hin$

7ci fgY'GWXYXi `Y

J]Yk 'WUgg'ha YhUV'Y

H]a YtUV`Y

8UhY	Hmd Y	7 cbhYbh
K YY_'%'% ': YVfi Ufm!'&(: YVfi Ufm	GYa]bUf	⇒hfcXi Wi Wijcb.: fca 'efgV[S Zg_S`[fSf[e'hc'h\Y <ia b]j="" cxyfb'f="" td="" ub]hjyg']b'h\y'a="" yfg]hm<="" ygyufw\'i=""></ia>
K YY_'&.'&) ': YVfi Ufm!'' A UfWX	GYa]bUf	″K ∖c°Ck bgʻ <i a="" fy3″<="" td="" ub°buhi=""></i>
K YY_'' . '('A UfWX '! '%\$		

FYgci fWfg

DfYgWf]VYX F Ygci fWYg

@jghcZkYY_`mfYUX]b[g'dfcj]XYX'UhrNY'glUfhcZHYfa '%cb'h\Y'A ccX`Y'Wci fgY'dU[Y"

FYWca a YbXYX FYgci fWyg

 $5XX] \textbf{f} \textbf{cbU}^{T}YW\textbf{c} \textbf{a} \textbf{a} \textbf{Y} \textbf{b} \textbf{X} \textbf{Y} \textbf{X}^{T}Y \textbf{U} \textbf{X}] \textbf{b} [\textbf{g}^{T}\textbf{c} \textbf{b}^{T}\textbf{h} \textbf{Y}^{T}\textbf{c} \textbf{d}] \textbf{W} \textbf{y}^{T}W\textbf{c} \textbf{j} \textbf{Y} \textbf{Y} \textbf{X}^{T}] \textbf{b}^{T}\textbf{K} \textbf{Y} \textbf{Y} \textbf{g}^{T}\textbf{\&}^{T}\textbf{b}^{T} \textbf{X}^{T} \textbf{U} \textbf{j} \textbf{U}]^{T} \textbf{U} \textbf{Y}^{T} \textbf{C} \textbf{b}^{T}\textbf{A} \textbf{cc} \textbf{X}^{T} \textbf{Y}^{T}W\textbf{c} \textbf{i} \textbf{fg} \textbf{Y} \textbf{d} \textbf{U} \textbf{J}^{T} \textbf{W} \textbf{c} \textbf{a} \textbf{A} \textbf{C} \textbf{C} \textbf{X}^{T} \textbf{Y}^{T} \textbf{W} \textbf{c} \textbf{i} \textbf{fg} \textbf{Y} \textbf{d} \textbf{U} \textbf{J}^{T} \textbf{J}^{T} \textbf{U} \textbf{J}^{T} \textbf{J}^{T$

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

: cfa U`ZYYXVUW_Zfca 'ghi XYbhg'k]``VY'Wt``YWhYX'j]U'a m9I dYf]YbWY'UbX'k]``VY'i gYX'hc']a dfcj Y'Z hi fY]hYfUh]cbg'cZh\]g'Wti fgY"'=bZcfa U`ZYYXVUW_]g'U'gc'j Yfmik Y`Wta Y" Gi Va]gg]cb cZ5ggYgga YbhHUg_g

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

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

_Zmci YbWci bhYf'U'dfcV`Ya 'k \Yb'UhYa dhJb['hc'gi Va]hmci f'Ugg][ba Ybhh\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'mYUft'' =Zmci
UfY'i bUV`Y'hc'gi Va]hmci f'Ugg][ba YbhXi Y'hc'U'ZUi 'hk]h\'Hi fb]hJb'mci 'a Um'Udd'mZcf'Ub'Y! hYbg]cbžVi hmci
a i ghfYhU]b'mci f'hJW_Yhbi a VYf'Zfca '9! hYfbU``Gi ddcfhfU'cb['k]h\'Ubmch\Yf'fY`Yj UbhXcW a Ybhgt'hc
]bWi XY'Ug'Yj]XYbW'hc'gi ddcfhmci f'Y! hYbg]cb'Udd`]WUhJcb'' =Zmci 'Ya U]`'9! hYfbU``Gi ddcfhmci 'k]``

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±iWUbihU_Yia Ubm Zcfa qžZfca iXYi]VYfUhYiW\YUh|b[ihciUVW]XYbhU`mWcdm]b[iZfca iUigci fWik]h\ci hiUW_bck iYX[Ya Ybh'i

IBGK '[fci dg'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_]b['k]th 'cth Yfg'Vi hidUgg]b['cZZth 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_'thc'Ubcth Yf'ghi XYbh'VYZcfY'th Y'Xi Y'XUHYZcf'Zcf'th Y'di fdcgY'cZth Ya

- 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 ž'ch\Yfg'k]``VY'bYk"'; U]b]b['U'gc`]X'i bXYfgHJbX]b['cZU``h\YfY`UhYX'UgdYWng'cZ9@+69'k]``\Y`d'mci 'a U_Y'h\Y'a cghicZmci f'ghi X]Yg'UhI BGK "'\\hd.##qi VYWfi |XYg"`]VfUfm'i bqk "YXi "Ui #\`]qY#JVci hY`]qY

5 WUXYa]W = DZcfa Uhjcb

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

fYei YghgʻZcfʻYl hYbg]cb/ `UhYʻgi Va]gg]cbgʻ[i]XY`]bYg/ fYj]Yk ʻcZa Uf_g/ I BGK ʻ< YUʻh\ 'UbXʻGUZYhmdc`]WJYg/