

HG; 'B Yi ghfY`]hn. '9fZc`[fY]WX Yf GU]gcbghUfh'hfchn' < YfUi gZcfXYfi b[Yb

HG; 'BYi ghfY`]hn'ghUfhYh'a]h'bYi Ya '? Ud]hÀb'B]`g'F $\dot{O}h$ \']b'X]Y GU]gcb'&\$&(#&) 'i bX'ghfYVh'9bhk]W_`i b['i bX'G]Y[Y'Ub"

#D'XYf'`Ui ZYbXYb'GU]gcb'nY][h'g]WX'X]Y'HG; 'BYi ghfY`]hn'a]h'Y]bYa
[Ya]gWX hYb'GhUfh']b'X]Y'CVYf`][U"'BUWX'Y]bYa 'ØVYfnYi [YbXYb
' .\$!G]Y['[Y[Yb'HYbb]g'6cfi gg]U'6Yf`]b'Zc`[hY'Y]bY'\$.&!B]YXYf`U[Y
]a '<Y]a gd]Y`'[Y[Yb'5b_Yf'K]ga Uf"'8cWX'[`Y]WX']b'XYf'YfghYb
Fi bXY'XYg'A J!@UbXYgdc_U`g'gYhnhY'g]WX'X]Y'A UbbgWXUZh'a]h
Y]bYa 'VYY]bXfi W_YbXYb'*.\$'VY]'Fch!K Y]» 'Hf]bk]``Yfg\U[Yb'Ui g
XYf'@UbXYg_`UggY'Xi fWX"'8]YgY'9f[YVb]ggY'nY][Yb'XUg'DchYbn]U`
i bX'X]Y'9bhk]W_`i b[ga Ò[`]WX_Y]hYb'XYg'HYUa gž'XUg']b'X]Y'bYi Y
Gd]Y`nY]h'[YghUfhYh']gh"</pre>

8 Ug; Yg]WkhXYf'A UbbgWkUZh'\Uhrg]Wk'g]Wk'hVUf'j YfÀbXYfhž'XYbb a]h'B]'g'F Oh\'\Uh'X]Y'HG; 'Y]bYb'bYi Yb'? Ud]hÀb"'8Yf'&+!'À\f][Y 5 Vk Y\fgd]Y`Yf'`OghY'?Yj]b'F]YWkYfh'UVž'XYf'gY]bY'?Uff]YfY VYYbXYh'\Uh"'F Oh\'Vf]b[h'9fZU\fi b['i bX': Ø\fi b[g_ca dYhYbn a]hž'XU'Yf'gY]h'&\$%, 'HY]`'XYg'HYUa g']gh'i bX''U`g'X]YbghÀ`hYghYf Gd]Y`Yf'[]`h"' =\Wk'ZØ\`Ya]Wk'di XY`k c\`']a 'JYfY]b ž'Ài »Yfh'Yf'g]Wk ØVYf'gY]bY'Fc``Y'i bX'X]Y'JYfY]bgdc`]h]_"'8]Y'5a V]h]cbYb'XYg ?`i Vg'gh]a a Yb']\b'cdh]a]gh]gWk'ZØf'X]Y'GU]gcb"

9]b 'Gd]Y` 'a]h 'DchYbn]U`

F Oh\ ž'XYf'VYfY]hg'ZØf'bUa\UZhY'JYfY]bY'k]Y'< UbgU'FcghcW_'=ibX <c`ghY]b'?]Y`'gd]Y`hYž'\Uhij]Y`'ØVYf'XUg'Gd]Y`'ni 'gU[Yb"'=aU_hiY``Yb''!(!&!%!GmghYa ž'XUg'XUg'HYUa 'VYjcfni[hž']gh'Yf'U`gFYW\hgjYfhY]X][Yf'HY]`'Y]bYf'ghUf_Yb'8fY]Yf_YhhYž'X]Y'gckc\`XYZYbg]j'U`g'UiW\'cZZYbg]j'5_nYbhY'gYhnYb'_Ubb"'B]`g'\YVh

\Yfj cf.`K]fig]bXiU`g`HYUa ii bZUggVUf``Ui ZghUf_žiX]Y::]hbYgg`dUggh ni iY]bYf`8fY]Yf_YhhY"'8UXi fWX`\UVYb`k]ficZZYbg]j ia Y\f A Ò[`]WX_Y]hYb"'8Ug`GmghYa i_Ubb'j]Y``GdU» ia UWXYb" i8]YgY dcg]h]j Y`9]bghY``i b[igd]Y[Y`h'g]WXi]b`XYf`HYUa XmbUa]_ik]XYfžiX]Yg]WXi]b`XYb`_ca a YbXYb`Gd]Y`Yb`k Y]hYf`ZYgh][Yb'gc``"

8]Y'bÀW\ghY'<YfUi gZcfXYfi b['ghY\h'VYfY]hg'j cf'XYf'HØf.'=a
5i gk Àfhggd]Y`[Y[Yb'XYb'6Yf`]bYf'5?'k]fX'FÒh\'gY]bY'A UbbgW\UZh
YfbYi h'a ch]j]YfYb"' =\W\'Yfk UfhY'Y]bY'À\b`]W\'4 b[Y'A UbbgW\UZh
X]Y'UVYf'gY\f'gd]Y`ghUf_']gh"'B]W\hgXYghchfchn'k c``Yb'k]f'XUg'Gd]Y`
[Yk]bbYbž'XUg']gh']a a Yf'i bgYfY'N]Y`ghY``i b[ž'gU[h'Yf
YbhgW\`cggYb"'5b[Yg]W\hg'XYf'V]g\Yf][Yb'9f[YVb]ggY']gh'Yg'_`Ufž
XUgg'X]Y'HG; 'bcW\'Ub']\fYb'Gd]Y`nØ[Yb'UfVY]hYb'k]fXž'i a 'g]W\']a
K YhhVYk YfV'VYggYf'ni 'VY\Ui dhYb"

8]Y`XYfnY]h][Y`HUVY``Yb`U[Y`nY][hžXUgg`BYi ghfY`]hn`a]h`XfY]
Di b_hYb`Ui g`nk Y]`Gd]Y`Yb`Ui Z`FUb[`gYWkg``]Y[h''K À\fYbXXYggYb\Uh`XYf`FY[]cbU``][]gh`Ui g`6Yf`]b`j]Yf`NÀ\`Yf`[YgUa a Y`h`i bX`]ghgca]h`Y]bYb`D`Uhn`j cf`XYf`HG; "`8]YgY`8mbUa]_`]a`HYUa`i bX`X]YFYUXmlhc!D`Uml9]bghY``i b[`XYg`bYi Yb`?Ud]hÀbg`_ÒbbhYb`XYfGWX`ØggY``gY]bži a`X]Y`[Yk ØbgWXhYb`9fZc`[Y`]b`XYf`@][U`i bX`]aDc_U``ni `Yfn]Y`Yb"

8 Y f K Y ['ni f '9 b hk] W_ `i b [

8]Y'A UbbgW\UZh'VYZ]bXYh'g]W\']b'Y]bYa '9bhk]W_`i b[gdfcnYggž'k UgXYf'?Ud]hÀb'B]`g'F Oh\'_``Uf'Yf_Ybbh" K]f'\UVYbž'gY]hXYa ']W\'VY]XYf'HG; 'V]bž'X]Y'a]h'5VghUbX'Øb[ghY'A UbbgW\UZh"'8U']gh'Yg'_`UfžXUgg'b]W\h'j cb'\Yi hY'Ui Z'a cf[Yb'U``Yg'Z b_h]cb]YfYb'_Ubb žYf_`Afh'Yf"'8]YgY'5i ggU[Y'nY][h'XYb'6Yk i gghgY]bgk UbXY`]bbYf\U`V'XYg'HYUa gž'XUg'a Y\f'; YXi `X'i bX'NY]h'Ui ZVf]b[Yba i ggž'i a ']\fY'@Y]ghi b['_cbghUbh'ni 'ghY][Yfb"

8]Y'_ca a YbXYb'K cW\Yb'k YfXYb'YbhgW\Y]XYbX'gY]bži a 'X]Y j YfgW\]YXYbYb'GhfUhY[]Ybž'X]Y'X]Y'HG; 'j YfZc`[hž']b'X]Y'HUh i a ni gYhnYb"'FÒh\'[`Ui Vh'Ub'X]Y'9bhk]W_`i b['XYg'HYUa g"' 8]Y NY]W\Yb'ghY\Yb'X]YgY'GU]gcb'Ui Z'9bhk]W_`i b["'5VYf']W\'a Yf_Yž k]Y'g]W\X]Y'A UbbgW\UZh'bUW\'9fZc`['gY\bh" '8]Y

< YfUi gZcfXYfi b[ž'Y]bY '1 b[Y'i bX'\i b[f][Y'A UbbgW\UZh'ni f
< OW\\gh`Y]ghi b['ni 'a ch]j]YfYbž'k]fX'YbhgW\Y]XYbX'XUZØf'gY]bž'cV
X]Y'HG; 'BYi ghfY`]hn']b'XYf'CVYf`][U'YfZc`[fY]W\'gY]b'_Ubb"</pre>

8]Y'HG; 'BYi ghfY`]hn']gh'i a [YVYb'j cb'Y]bYf'`Ub[Yb
:i » VU``hfUX]h]cb']b'A YW_`YbVi f[!Jcfdca a Yfb"'8]YgY'FY[]cb'\Uh
]b'XYb'`YhnhYb'\\\]\fnY\bhYb'j]Y'Y'hU`Ybh]YfhY'Gd]Y`Yf
\Yfj cf[YVfUW\h'i bX'k Uf'a Y\fZUW\'GW\Ui d`Uhn'VYXYi hYbXYf
:i » VU``YfY][b]ggY"'8]Y'HG; 'gY`Vgh'V`]W_h'Ui Z'Y]bY'VYk Y[hY
; YgW\]W\hY'ni fØW_ž']b'XYf'g]Y'gck c\``]b'\O\YfYb'@][Yb'U`g'Ui W\
]b'i bhYfYb'Gd]Y`_`UggYb'U[]YfhY"'8]Y'JYfY]bgghfi _hi f'k]fX'ghUf_
j cb'XYf'`c_U`Yb'; Ya Y]bgW\UZh'[YhfU[Ybž'k Ug'g]W\'Ui W\']b'XYf
I bhYfghØhni b['XYf': Ubg'i bX'GdcbgcfYb'k]XYfgd]Y[Y`h''\\\)'XYb
`YhnhYb'\\\]\fYb'\Uh'g]W\'XYf'JYfY]b'i bhYf\U`V'XYf'CVYf'][U
cf[Ub]g]Yfhž'k Ug'Y]bY'k]W\h][Y'Fc``Y'ZØf'X]Y'9bhk]W_`i b['j cb
'\b[Yb'HU`YbhYb'qd]Y`h"

8]Y 6YXYi hi b[XYf iz [YbXUfVY]h

9]b 'nYbhfu`Yg'9`Ya Ybh'XYf'JYfY]bgghfuhY[]Y']gh'X]Y'i a ZuggYbXY

\$\frac{1}{2} \text{ | YbXUfVY]h" 8 Yf'J YfY]b \text{ | Uh'Yg'g]W\text{ 'ni f'5i Z[UVY'[Ya UW\text{ 'b[Y Gd]Y'Yf'ni 'Z\text{ 'DfXYfb''i bX']\text{ bYb''X]Y' A \text{ O[`]W\text{ _Yg']h'ni '[YVYb\text{ '2']b'Y]bYf}}}

dfc ZYgg]cbY``Yb'I a [YVi b['ni 'gd]Y`Yb" 8]Yg']gh'VYgcbXYfg

k]W\text{ h][\text{ 'z'XU'X]Y'gdcfh']W\text{ Yb '9fZc`[Y'XYf'HG; 'Yb['a]h'XYf}}

9bhk]\text{ _i bX' \delta hY[fUh]cb'bYi Yf'HU`YbhY' j YfVi bXYb'g]bX"'B]`g}

F \text{ Oh\text{ 'z'XYf'U`g'? Ud]h\text{ hb'Y]bY'GW\text{ '\text{ \text{ \text{

8]Y?ccdYfUh]cb'a]h'GW\i`Yb'i bX'`c_U`Yb'Gdcfhj YfY]bYb']gh'Y]b\kY]hYfYf'6YghUbXhY]`'XYf'\to [YbXUfVY]h''N]Y`']gh'Ygž'Y]b'VfY]hYg\ibXUaYbh'Ub''\to [Yb'Gd]Y`Yfb'ni 'gW\UZZYbž'X]Y'gckc\`Zi\vVU``Yf]gW\'U`g'Ui W\']bX]j]Xi\Y``'[YZÒfXYfh'k\YfXYb'''8UVY]\k\YfXYb''Ui W\'gcn]U`Y'?ca\dYhYbnYb'i bX'HYUa[Y]gh'[YghÀf_hž'k\Ug\X]Y'Gd]Y`Yf'b]W\h'bi f'Ui Z'XYa 'D`Uhnž'gcbXYfb'Ui W\']a '5``hU[ghÀf_h''

 $8\,]Y\,<\,Y\,fUi\,gZc\,fX\,Y\,fi\,b\,[\,\,\check{z}\,'Y\,]b\,Y\,'\,^{1}\,b\,[\,\,Y\,'A\,\,Ub\,b\,gW\!\!,\,UZ\!\!h\,'ni\,\,\,'Z\!c\,fa\,\,\,Y\,b\,\check{z}\,']gh'nk\,\,Uf$

 $[fc * \check{z}'U``YfX]b[g'[]Vh'Yg'VYfY]hg'j]Y`Y'dcg]h]jY'6Y]gd]Y`Y\check{z}'k]Y''^{1}b[YGd]Y`Yf']b'XYf'CVYf`][U'VYghY\Yb'_ObbYb'''+b'XYf'`YhnhYb'GU]gcb \\ \label{eq:continuous} UVYb'a Y\fYfY'BUW\ki W\kiggd]Y`Yf']\fY'7\UbW\f'[Ybi hnh'i bX'g]W\kig'k Yfhj c``Y'6YghUbXhY]`Y'XYg'HYUa g'Yfk]YgYb''$

8 YhU]`g

6Ygi WXYb 'G]Y 'i bg 'Ui Z. 'a Y]b!VYf `]b "bYh