

Dcfh'F]WXYm'J]WY'A Umcf'7\f]g'A U\Yf'Udc`c[]nYg'Zcf WcbhfcjYfg]U`'Wca a Ybhg'Ua]X'X]gW'gg]cbg'cb'U'dchYbh]U` ghfcb[!a Umcf'gmghYa"



DcfhF]WXYmž: `cf]XUžI G5'!=b'U'fYWbh'hi fb'cZYj Ybhg']b'DcfhF]WXYmž'J]WY'A Umcf'7\f]g'A U\Yf'\Ug'Zci bX'\]a gY`Z'Uh'h\Y'WbhYfcZ'U'Wca a i b]hm'i dfcUf'Zc``ck]b['Wca a Ybhg'\Y'a UXY'Xi f]b['U Whm'Wci bW]`a YYh]b['cb'**\m', "'A U\Yf'fYZYfYbWXX'@Uh]bcg']b'U a UbbYf'h\Uh'a Ubm'Zci bX'cZZYbg]j Yž'gdYU_]b['UVci h'h\Y]f]bj c'j Ya Ybh']b'h\Y'\ci g]b['a Uf_Yh'Vm'bch]b['h\Ym'Vi m'UbX'Z]d\ca Yg'WXYUd`m''<Y'Yj Yb'fYZYffYX'hc'U'WcbhfUWhcf'Ug'U' @Uh]bc[i m'k cf_]b['i bXYf'h\Y'hUV`Yž'fYa Uf_g'h\Uh'\Ug'gdUf_YX'ci hfU[YUa cb['fYg]XYbhgž'dfca dh]b['\]a 'hc']ggi Y'Ub'Udc`c[m'Xi f]b['h\Y Wci bW]`g'Z]fgh'a YYh]b['g]bW'h\Y']bW]XYbh''A U\Yf'UW_bck `YX[YXh\Uh'\Y'fYdYUhYX`m'WU``YX'ci h'cbY'Yh\b]W]hm'UbX'Yl dfYggYX'\]gfY[fYh']Z'\]g'Wca a Ybhg'k YfY'dYfWY]j YX'Ug'bY[Uh]j Y'cfX]gdUfU[]b['ž'Ya d\Ug]n]b['h\Uh'h\YfY']g'bc'd`UWY'Zcf'dfY'X]W

H\Y'VUW_`Ug\`Zfca 'A U\Yf g'Wca a Ybhg']g'1 gh'cbY'cZ'gYj YfU`
W\U``Yb[Yg'W ffYbh`m'ZUW]b['h\Y'Dcfh`F]W\Ym'W]hm'Wci bW]`"K]h\'h\Y
fYg][bUh]cb'cZ'7]hm'A UbU[Yf'A Uhh\Yk'7cdd`Yf'cb'5df]`'%+ž
X]gW gg]cbg'\Uj Y'Ya Yf[YX'UVci h'dchYbh]U`'W\Ub[Yg'hc'h\Y'W]hm g
[cj YfbUbW'ghfi Whi fY"'BYk `m'Y`YWhYX'7]hm'7ci bW]``a Ya VYf
A U\Yf']g'UXj cWUh]b['Zcf'U'hfUbg]h]cb'Zfca 'h\Y'W]hm'a UbU[Yf
a cXY``hc'U'ghfcb[!a Umcf'gmghYa "'H\]g'dfcdcgU``\Ug'gh]ffYX'i d
XYVUhYg']b'h\Y'Wca a i b]hm''5'ghfcb[!a Umcf'a cXY``k ci `X'[fUbh
h\Y'Y`YWhYX'a Umcf'Wcbg]XYfUV`Y'YI YW'h]j Y'Ui h\cf]hmž'dchYbh]U``m
Yb\UbW]b['Vch\'YZZ]W]YbWm'UbX'fYgdcbg]j YbYgg']b'W]hm
UXa]b]ghfUh]cbž'Ug'ci h`]bYX'Vm'A YX]Ub'BYk g'Gci fWY'"

7\Ub[]b[; cjYfbUbW

H\Y'YI]gh]b['acXY``\Ug'h\Y'7]hm'7cibW]`gYhh]b['dc`]W]Yg'k\]`Y'U
W]hm'aUbU[Yf'cjYfgYYg'XU]`m'cdYfUh]cbg"'DfcdcbYbhg'cZ'h\Y
ghfcb[!aUmcf'acXY``VY`]YjY']h'Wci`X'Wi`a]bUhY']b'ghfcb[Yf
`YUXYfg\]d/\ckYjYfž'g_Ydh]Wg'jc]WY'WcbWYfbg'UVcih'h\Y'dchYbh]U`
]bghUV]`]hm'h\Uh'a][\h'Uf]gY'Zfca'ZfYeiYbh'g\]Zhg']b'_Ym'dcg]h]cbg"
H\Y'hckbg'aUmcfž'&\b'9f]W<ccjYfž']bX]WUhYX'U'bYYX'Zcf'Ub
]bhYf]a'aUbU[Yf'k\]`Y'gYUfWX]b['Zcf'U'dYfaUbYbh'fYd`UWYaYbhž
ibXYfgWcf]b['h\Y'if[YbWm'cZ'h\Y'g]hiUh]cb"'AYUbk\]`Yž
X]gWigg]cbg'giffcibX]b['h\Y'bYWYggUfm'WXUfhYf'UaYbXaYbhg'hc
]ad`YaYbh'h\]g'[cjYfbUbWY'WXUb[Y'aUm'YjYbhiU``m'`YUX'hc'U
diV`]WfYZYfYbXiaž'ZcghYf]b['Yb[U[YaYbh'Uacb['`cWU``fYg]XYbhg"

5h'U'fYW'bh'Wci bWj\a YYh]b['\Y\X'cb'5df]\&&ž'A U\Yf'Vfci [\hi d h\Y'XYVUhY'cb'k\Yh\Yf'U'gk]hW\hc'U'ghfcb[!a Umcf'gmghYa 'Wci \X ghfYUa \]bY'XYWjg]cb!a U_]b['dfcW'ggYg"'K\]\Y'\Y'fYWc[b]nYX 7cdd\Yf g'YZZYWh]j YbYggž'\Y'U\gc'YI dfYggYX'k cff]Yg'UVci h'h\Y ei U\]ZJ\WJh]cbg'cZ'Zi hi fY'Wjhm'a UbU[Yfg"'H\Y'h\ci [\hicZ'\Uj]b['U a Umcf'k\c']g'U'[Ybi]bY'dUfh'cZ'h\Y'Wca a i b]hm'k Ug'U\gc UXXfYggYXž'Ug'<ccj Yf'dc]bhYX'ci h'h\Y']a dcfhUbWY'cZ'\cWU\[cj YfbUbWY']b'g\Ud]b['Dcfh'F]W\Ymg'Zi hi fY'"

 $\label{lem:continuous} 5g`Dcfh`F]W\ Ym`ghUb\ Xg`Uh`h\]g`Wfcggfc\ UXgž`h\ Y`Wca\ a\ i\ b]hm`]g$

YU[Yf`m'k UhW\]b[`UbX``]ghYb]b["'K]```U`g\]Zh`]b`[cj YfbUbW\ghfi Whi fY`]a dfcj Y``cWU``a UbU[Ya Ybh'UbX``YUXYfg\]d3'Cf'k]```]h WfYUhY`U`f]dd`Y`YZZYWh`cZ`]bghUV]`]hm3'H\Y`fYg]XYbhg`UfY`YI dYWhYX hc`fYa U]b`Yb[U[YX`UbX'j cWU``Ug`h\YgY`X]gW' gg]cbg'i bZc`Xž dfcj]b[`cbWY`U[U]b`h\Uh``cWU``[cj Yfba Ybh']g`hfi `m'U`fYZYWh]cb`cZ]hg`Wca a i b]hm"

: cf`h\cgY`]bhYfYghYXž`fYWcfX]b[g`cZ'fYWVbh`7]hm`7cibW]`a YYh]b[gž]bWiX]b['h\Y`5df]``&&`[Uh\Yf]b[ž`UfY`UjU]`UV`Y`Zcf`j]Yk]b['cbMciHiVYž`U``ck]b['fYg]XYbhg`hc`ghUm`]bZcfa YX`UVcih`h\YdfcWYX]b[g`UbX`XYW]g]cbg`VY]b['a UXY`]b`h\Y]f`VUW_mUfX"

8 YhU]`g	
Cfh	DcfhF]WXYmž: `cf]XUžI G5
Ei Y``Yb	kkk"UVWUWh]cbbYkg"Wca
	a YX]UbYk ggci fWY"Wca

6Ygi WXYb G]Y i bg Ui Z. a Y]b!k]Yb bYh