CgWYc`U'G\Yf]ZZ'A UfWcg'@cdYn': UWYg 7ci fh'Cj Yf'5``Y[YX'; Ua V`]b['GWX Ya Y



CgWc`U`7ci bhmž: `cf]XUž'I G5 !!H\Y'fYWbh`Y[U`kcYg gi ffci bX]b['CgWc`U'7ci bhm'G\Yf]ZZ'A UfWcg'@cdYn'\Uj Y'gYbh g\cW_k Uj Yg'h\fci [\'h\Y'Wca a i b]hm''@cdYnž'k\c'k Ug'gi gdYbXYX Vm'; cj Yfbcf'Fcb'8YGUbh]g'cb'H\i fgXUmž']g'ZUW]b['gYf]ci g U``Y[Uh]cbg'ghYa a]b['Zfca '\]g']bj c`j Ya Ybh']b'U'a Ugg]j Y [Ua V`]b['cdYfUh]cb'h\Uh'cZZ]W]U`g'gUm'\Ug'[YbYfUhYX'cj Yf'`&%"* a]``]cb']b']``]W]h'dfcWYXg"'5VWcfX]b['hc': cl'') 'Cf`UbXcž'@cdYn g Z]fgh'Wci fh'UddYUfUbW']g'gYh'Zcf': f]XUm'a cfb]b['Uh'-'U"a "'j]U Ncca "

5ffYghYX'UbX'W'ffYbh`m'\Y`X'Uh'@U_Y'7cibhm'\J]`ž'@cdYn'ZUWYg W\Uf[Yg'cZ'fUW_YhYYf]b['UbX'Wcbgd]fUWm'hc'Wcaa]h'fUW_YhYYf]b[" H\Y':`cf]XU'5hhcfbYm'; YbYfU`g'CZZ]WY'U``Y[Yg'h\Uh'\Y'\Ug'igYX $\label{thm:condition} $$ \log d c g h c g u Z Y [i u f X h h g] `Y [u Y b h Y f d f] g Y Z c f d Y f g c b U `Z] b U b W J U `I u J b `U b X z f Y d c f h Y X `m z W U a d U] [b `W c b h f] V i h J c b g " @ c d Y n k U g `Z J f g h `Y `Y W h Y X `g \ Y f J Z Z J b `B c j Y a V Y f `& $ & $ `U b X `k U g `f Y ! Y `Y W h Y X `J b & $ & (z `J b X J W U h J b [`U `Y j Y ` c Z h f i g h `Z f c a `j c h Y f g `h \ U h `b c k `U d d Y U f g X Y Y d `m g \ U _ Y b "$

=bj Ygh][Uh]j Y :]bX]b[g

: `cf]XU'8YdUfha Ybh'cZ'@Uk '9bZcfWYa Ybh'7ca a]gg]cbYf'A Uf_; `Ugg'gi WW]bWh`m'YI dfYggYX'h\Y'[fUj]hm'cZ'h\Y'g]hi Uh]cbž'ghUh]b[h\Uh'@cdYn'j]c`UhYX'h\Y'hfi gh'YI dYWhYX'Zfca 'gca YcbY']b'\]g dcg]h]cb"'H\]g']g'U'Wcbg]XYfUV`Y'ZU```Zfca '[fUWY'Zcf'h\Y'g\Yf]ZZžk\c'\Ug'fYWY]j YX'UWWc`UXYg'h\fci [\ci h'\]g'WUfYYfž']bWi X]b['h\YYYghUV`]g\a Ybh'cZ'WYbhfU`': `cf]XU g'Z]fgh'U``!ZYa U`Y'dc`]WYUWUXYa mž'K ca Yb'cb'K UhW\ž'k\]W\'Y'Zci bXYX'hc'Ya dck Yfk ca Yb']b'`Uk'YbZcfWYa Ybh'

HfUbg]h]cb]b @YUXYfg\]d

±b^`][\hcZh\YgYhfciV`]b['XYjY`cdaYbhgž7\f]ghcd\Yf6`UW_acb\Ug'VYYb'Uddc]bhYX'Ug'h\Y']bhYf]a 'g\Yf]ZZcZ'CgWc`U'7cibhm''6`UW_acbžk\c'VcUghg'') 'mYUfg'cZ`Uk'YbZcfWaYbh'YldYf]YbWYUbX'gidYfj]gYg'cjYf',)\$'gkcfb'hfccdYfg'UbX'-)'W]j]`]UbYad`cmYYgž'k]``'cjYfgYY'h\Y'XYdUfhaYbh'Xif]b['h\]g'hfUbg]h]cb''7cibhm'AUbU[Yf'8cb':]g\Yf'\Ug'diV`]Wm'YldfYggYX'\]g\\CbZ]XYbWY']b'6`UW_acbž'Yad\Ug]n]b['h\Y']adcfhUbW'cZ'ghUV]`]hm

]b `YUXYfg\]d Xi f]b[hi a i `hi ci g h]a Yg"

5g'h\Y'`Y[U``dfcWYX]b[g'UXjUbW'žaUbm'UfY'`YZh'kcbXYf]b[UVcih'h\Y'`cb[!hYfa']ad`]WUh]cbg'Zcf'h\Y'g\Yf]ZZg'cZZ]WY'UbX'h\YWcaaib]hm']h'gYfjYg"'K\]`Y'@cdYn'dfYdUfYg'Zcf'\]g'bYIh'WcifhXUhY'cb'\$bY''\$ž'fYg]XYbhg'WUb'cb`m'\cdY'Zcf'WUf]hm'UbXfYgc`ih]cb']b'U'g]hiUh]cb'h\Uh'\Ug'WUgh'U'g\UXck'cjYf'`cWU```UkYbZcfWYaYbh''H\Y'ghcfm'fYaU]bg'Zi]Xž'UbX'idXUhYg'UfY'`]_Y`m'Ugh\]g'ibdfYWYXYbhYX'WUgY'ibZc`Xg"

cf'bck ž']h'gYYa g'CgW'c`U'7ci bhm'a i gh'[fUdd`Y'k]h\'h\Y'ZU``ci h Zfca '@cdYn g'UWh]cbg'k\]`Y'U`gc'`cc_]b['hc'h\Y'Zi hi fY'k]h\'U'bYk g\Yf]ZZ'Uh'h\Y'\Y`a "'H\Y'Wca a i b]hm'hfi ghg'h\Uh''l gh]\W''k]``'dfYj U]`Ug'h\]g'ghcfm'XYj Y`cdgž'fYa]bX]b['Yj YfmcbY'h\Uh'h\YfY g'U'Z]bY`]bY'VYhk YYb'di V`]WgYfj]\W''UbX'dYfgcbU`']bhYfYgh']b'h\Y'k cf'X'cZ`Uk 'YbZcf\Wa Ybh"

5g'k Y'a cj Y'Zcfk UfXž'ghUm'hi bYX'Zcf'Zl fh\Yf'i dXUhYg'UbX'U Wca dfY\Ybg]j Y'VfYU_Xck b'cZ'h\Y'i bZc`X]b['`Y[U`'gWYbUf]cg gi ffci bX]b['cbY'cZ': `cf]XU g'cbWY!dfca]bYbh'g\Yf]ZZg"

♣b 'h\ Y 'k cfXg'cZ'Ub'c`X'UXU[Yž' U'`YcdUfX'XcYgb h'W\ Ub[Y']hg
gdchgž 'UbX'cbY'WUb h'\Y`d'Vi h'dcbXYf'h\ Y'a YUb]b['VY\]bX'h\]g
Ug'h\ Y'`Y[U``dfcWYYX]b[g'U[U]bgh'@cdYn'a cj Y'U\YUX"

8 YhU]`g	
Cfh	CgWYc`U'7cibhmž': `cf]XUž'IG5
EiY``Yb	• k k k "Zcl') cf`UbXc"Wca
	• k k k "mU∖cc"Wca
	• kkk"bVWbYkg"Wca

6 Ygi W Yb G]Y i bg Ui Z a Y]b!k]Yb "b Yh