GhUb`Ym'7i d'G\ck Xck b. K]``DUbh\Yfg A $U_Y = h \cdot \&! \% \cdot 5[U]bgh'C$]`Yfg3



Gi bf]gYž: `cf]XUžI G5 !:H\Y'GhUb`Ym'7i d::]bU``]g'\YUh]b['i d'Ug h\Y': `cf]XU'DUbh\Yfg'dfYdUfY'hc'WUg\k]h\'h\Y'9Xa cbhcb'C]`Yfg Zcf'; Ua Y''']b'Gi bf]gYž: `cf]XU"'5ZhYf'Ub'YI\]`UfUh]b['Xci V`Y! cj Yfh]a Y'j]Whcfm']b'; Ua Y'&ž'k\YfY'h\Y'DUbh\Yfg'hf]i a d\YX')!(ž Vch\'hYUa g'UfY'Vf]a a]b['k]h\'WcbZ]XYbWY'UbX'UbI]Yhm'Ug'h\Ym [YUf'i d'Zcf'k\Uh'dfca]gYg'hc'VY'Ubch\Yf'bU]`!V]hYf"'H\Y
D`Umc ZZg'fYdcfhg'h\Uh'h\Y'DUbh\Yfg'UfY'W' ffYbh`m'ZUj cfYX'hc'k]b Xi Y'hc'h\Y]f'\ca Y']WY'UXj UbhU[Yž'k]h\'VYhh]b['cXXg'gYh'Uh'%%#%\$ž Wca dUfYX'hc'h\Y'C]`Yfg'' +#&\$'cXXg"

±b; Ua Y'&ž']h'k Ug'bcbY'ch\Yf'h\Ub'6fUX'A UfW\UbX'k \c'a UXY'h\Y\\YUX`]bYgž'gWcf]b['hk c'Wfi W]U`'[cU`gž']bWi X]b['h\Y'[Ua Y!k]bbYf"Bch'hc'VY'ci hXcbYž'7cfYm'DYffm'g\ck WUgYX'\]g'dfck Ygg'Vm'hm]b[

h\Y`[Ua Y`Zcf`h\Y`DUbh\Yfg`k]h\`'\ gh`%, `gYWcbXg`fYa U]b]b[`]b`h\Y h\]fX`dYf]cX"`H\Y`]bhYbgY`a ca Ybhi a `Wcbh]bi YX`Zfca `; Ua Y`%ž k\YfY`h\Y`C]`Yfg `7cbbcf`A W8Uj]X`UbX`@Ycb`8fU]gU]h``d`UmYX d]j chU``fc`Yg`]b`9Xa cbhcb g`Wca YVUW_j] Whcfm"

5 GYf]Yg cZ'Hk]ghg UbX Hi fbg

H\]g'GhUb`Ym'7i d':]bU``\Ug'U`fYUXm'VYYb'a Uf_YX'Vm']hg
i bdfYX]WhUV]`]hm"5Wfcgg'hk c'[Ua Ygž'ZUbg'\Uj Y'k]hbYggYX'b]bY
dYf]cXg'cZ'd`Um'UbX'U'ghU[[Yf]b['hchU`'cZ'%*'[cU`gž'U`cb[g]XY
Y][\h'`YUX'W\Ub[Yg'UbX'g]I '[Ua Y!hm]b['[cU`g"' \denote g'UzY'hc'gUm
h\Uh'bY]h\Yf'hYUa '\Ug'a UbU[YX'hc'Xca]bUhYž'k]h\'h\Y'DUbh\Yfg
cb`m'\c`X]b['U'hk c![cU```YUX'Zcf'U'a YfY'a]bi hY'Xi f]b['; Ua Y'%"
9I dYfhg'Zfca 'H\Y'BYk 'Mcf_'H]a Yg'k Y][\']bž'dfYX]Wh]b['mYh
Ubch\Yf'WcgY'WcbhYgh']b'; Ua Y'' ž'dchYbh]U``m'`YUX]b['hc'cj Yfh]a Y
cbWY'U[U]b"

GhUf D`UmYfg Ub X DfYX]Wh]cbg

K\Yb`YI Ua]b]b[`_Ym'd`UmYfgž'Vch\`gei UXg`\Uj Y`h\Y]f`ZU]f`g\UfYcZ'\YUj m`\]hhYfg": cf`h\Y`C]`Yfgž'@Ycb`8fU]gU]h``ghccX`ci h`k]h\`**
dc]bhg`]b`h\Y`fY[i``Uf`gYUgcbž'k\]`Y`7cbbcf`A W8Uj]X`k Ugb h`ZUf
VY\]bX`k]h\`*' `dc]bhg"`H\Y`DUbh\Yfg``cc_`hc`GUa``FY]b\Ufhž'k\c
gWcfYX`Ub`]a dfYgg]j Y`' - `[cU`g`h\]g`dUgh`gYUgcb"`5g`h\Y`d`UmcZZg
i bZc`Xž'd`UmYfg`Wcbg]XYfYX`Zfcbhfi bbYfg`Zcf`h\Y`7cbb`Ga mh\Y
Hfcd\m`]bWi XY`h\Y`UZcfYa Ybh]cbYX`ghUfgž'Ug`k Y```Ug`GYf[Y]
6cVfcj g_m`Zcf`h\Y`DUbh\Yfg`UbX`5`Y_gUbXYf`6Uf_cj"

 $\label{eq:def-problem} DfYX]Wh]j\ Y'gi\ fj\ Ymg'WcbXi\ WhYX'Vm'B < @YI\ dYfhg'fYj\ YU``U`WcgY \\ VUhh`Y'U\YUX.') %") ı 'ZUj cf'h\Y'C]`Yfg'Zcf'h\Y'gYf]Yg'k]bž'k \]`Y \\ (, "(ı 'd`UWY'h\Y]f'VYhg'cb'h\Y'DUbh\Yfg"'5XX]h]cbU``mž'X]gW' gg]cbg Ufci bX'cZZ]W]Uh]b['UbX'dchYbh]U``W\Ub[Yg'hc'h\Y'd`UmcZZ'Zcfa Uh UXX'Ub']bhYfYgh]b[``UmYf'hc'h\Y'Wcbj YfgUh]cbž'k]h\'U'bchUV`Y , +"-ı 'cZ'ghUZZ'VUW_]b['U'fYhi fb'hc'U'a cfY'hfUX]h]cbU``%'j g''', d`UmcZZ'gYhi d"$

 $\label{thm:condition} K \]h\ Y \ Y \ fmh\]b \ [\ ``Uh'ghU_Y']b \ 'h\]b \ [\ ``GhUb`Ym'7i \ d': \]b \ U`ž'ZUbg \ WUb'\ UfX`m'ghUbX'h\ Y'Ub h]W]d \ Uh]c b'''K \]```h\ Y'DUb h\ Yfg'YI hYbX'h\ Y]f \ k \]bb]b \ [\ `ghfYU_ž'cf'k \]```h\ Y'C]`Yfg'fYhU`]UhY 3'C b`m'h]a Y'k]```hY``ž'Vi h cbY'h\]b \ [\ `]g'WYUf.'h\ Y']bhYbg]hm'UbX'YI W]hYa Ybh'UfY'gi fY'hc'f]gY \ Ug'h\ Y'gYf]Yg'Wcbh]bi Yg''$

8 Y hU]`g	
Cfh	Gi bf]gYž": `cf]XUž"I G5
EiY``Yb	h\Yd`UmcZZg"bYkg
	• k k k "\cW_Ym!fYZYfYbWY"Wca
	• k k k "bmh]a Yg"Wca

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