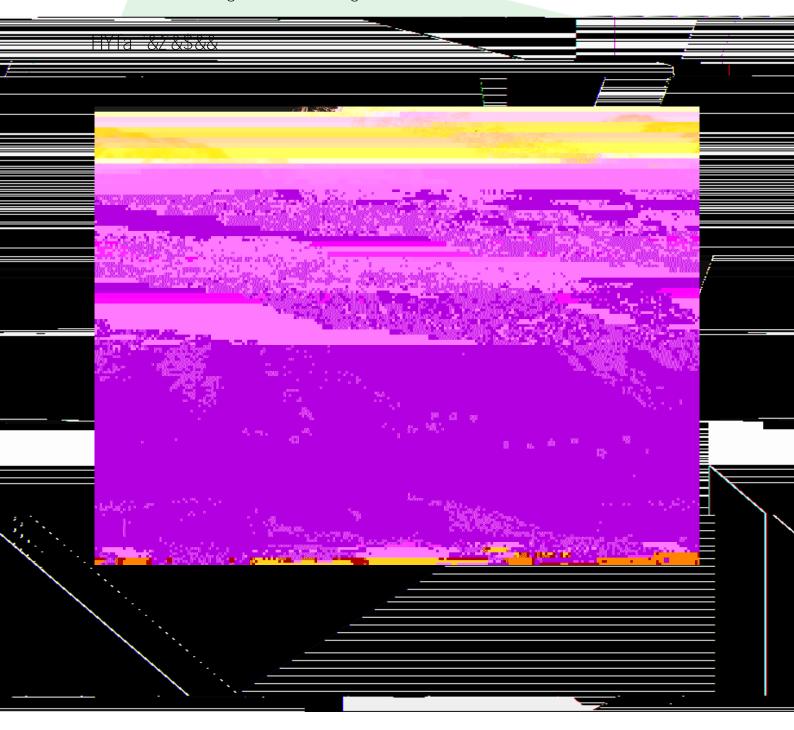


LING5024

HYGcibXGmghYaCZ9b[`]gV



7 ci fgY Cj Yfj]Yk

GHJZ7cbHJWh8YHJ]`g

7cbj Ybcfg

BUa Y	9a U]`	5j U]`UV]`]lm	@cWUh]cb	D\cbY
7`U]f`<]``	\(\forall \) \(\frac{1}{4} \in \text{logk "YXi "Ui} \)	VmUddc]bha Ybh	C b`]bY	\$()+'*\$''

GWXcc``7cbHJWhi±bZcfa Uh]cb

GWkcc``cZ<iaUb]hJYg'/ @Ub[iU[Yg

@c\\Ulrighthgap. G\\\cc``C\Z]\\\\ž\A\cfj\Yb`6fck\b'6i]\\]b[\ž\@Yj\Y``&\z\&),

CdYb]b['< ci fg. 'A cbXUm! ': f]XUmž'- Ua '!') da

HY`.'\$&'-'(, '\$(\$*

9a U]`. '<u>\U`4 i bgk "YXi "Ui</u>

5W_bck `YX[Ya YbhcZ7ci bhfm

I BGK '5fhgž'8Yg][b'UbX'5fW]hYWhifY'?Ybg]b[hcb'UbX'DUXX]b[hcb'WUadigYg'UfY'Vi]hhcb'5Vcf][]bU`

7ci fgY 8YHJ] g

I b]hg cZ7fYX]h**

Gi a a UfmcZh\Y 7ci fgY

#b^ih\]g^Wci fgYz^mci ^k]^``YI d`cfY^ih\Y^dUthYfbg^cZgdc_Yb^9b[`]g\"^Mci ^k]``Z|fghYI Ua]bY^ih\Y^Zcfa Ut]cb^cZ gci bXg^UbX^h\Y^gci bXg^h\Uha U_Y^i d^h\Y^9b[`]g\^gci bX^gmghYa "^Mci ^k]```th\Yb^Vi]`X^Zfca ^g]b[`Y^gci bXg hc^h\Y^Wca V]bUt]cb^cZgci bXg^]bhc^gm^UV^Yg^UbX^h\Y^fc^Y^cZgm^UV^Yg^]b^9b[`]g\^f\mt\a z^ih\Uh]gz^ih\Y

5ggYgga Ybh

5ggYgga YbhHJg_	K Y][\h	8iY'8UHY	7 ci fgY @YUfb]b[Ci hWca Yg 5ggYggYX
%"'HU_Y'\ca Y'hYgh	')	' \$ <i>#</i> \$* <i>#</i> \$\$&&`\$*.\$\$`DA	%
&"'DfYgYblUljcb	%) ।	Bch5dd`]WUV`Y	&
' "'Dfc YWh) \$1	%&#\$, #&\$&&`\$*.\$\$`DA</td><td>%ž`&ž`'</td></tr></tbody></table>	

5ggYgga Ybh% HU_Y \ca Y hYgh

8i Y'XUhY." \$#\$*#&\$&&'\$*.\$\$'DA

 $H\Y'hYgh'Wcj\ Yfg'h\Y'WcbhYbhcZfYUX]b[\ g'UbX'gYa\]bUf'X]gW'gg]cb'cZh\Ya\ ''\&'\ci\ fg'''Gh'\ XYbhg'fYWY]j\ Y k\ f]hhYb'ZYYXVUW_"$

H\]g`Ugg][ba Ybh]g`gi Va]hhYX`h\fci [\'Hi fb]h]b`UbX`ghi XYbhg`Xc`bchgYY`Hi fb]h]b`g]a]`Uf]hmfYdcfhg"

5ggYgga Ybh& DfYgYbhJh]cb

Gi Va]gg]cb bch/g. "H\Y df/gYbhUh]cbg k]```VY fcgh/fYX]bhc h\Y gWXYXi `Y"

%) '! '&\$ 'a]bi hYg" 'Ghi XYbhg 'fYWY]j Y 'k f]hHYb 'ZYYXVUW_"

H\]g`Ugg][ba Ybh]g`gi Va]hhYX`h\fci [\'Hi fb]h]b`UbX`ghi XYbhg`Xc`bchgYY`Hi fb]h]b`g]a]`Uf]hmfYdcfhg"

5qqYqqa Ybh' . Dfc YWh

8i Y'XUhY.'% #\$, #&\$&& \$*.\$\$ DA

 $Ghi XYbhg'k]``k cf_k]h gdYYW gUa dYg'h fci [\ci hh Y'h fa 'UbU'mg]b['h Y'gdYYW UWWfX]b['hc'Wfi fgYhcd]Wg''H YfY'UfY'h fYY'Ugg][ba Ybhg'h Uh Wc a df]gY'h Y'dfc YWfi HchU`'bi a VYf'cZk cfXg']g'Uddfci]a Uh Ym' $$$"Ghi XYbhg'fYWY] Y'k f]hh Yb'ZYYXVUW_"'$

H\]g]g h\Y ZbU`Ugg][ba YbhZcfUhYbXUbW di fdcgYg"

H\]g`Ugg][ba Ybh]g`gi Va]h\X`h\fci [\'Hi fb]h]b`UbX`ghi XYbhg`Xc`bchgYY`Hi fb]h]b`g]a]`Uf]hmfYdcfhg"

		@UVcfUhcfmik.cf_`Wcbh]bi YX`cb`5i ghfU`]Ub`9b[`]g\ UbX`~a UhYg\]d~"
K YY_'(.'&\$'>i bY'!'&(>i bY	GYa]bUf	%"@YWnfY.`7cbhYlhUbXijUf]Uh]cbif9b[`]g\Ł dfcbibWjUh]cb
		&"`8]gW gg]cb`cZFYUX]b[`GYh'.:DfcXiWf]cb`UbX DYfW dh]cb
		' "'CjYfj]Yk 'cZkYY_')!*'fYUX]b[g.'FYUX]b['GYh'(
		("'@UVcfUhcfmik cf'Hfi a d'GdYYW\'DUhhYfbg fbY`]Yj Y'a YŁ
K YY_")."&+">i bY"!"% >i `m	5ggYgga Ybh %	•

‰

	Dc`]h]W]gUh]cb'cZ9b[`]g\'DfcZ]W]YbWn@Ub[i U[Y'UbX'h\Y'>i gh]WY'GmghYa
	("'CfU`dfYgYbfUf]cbg'Ug'fcgfYfYX
) "'7 ci fgY'k fUd!i d

FYgci fWYg

DfYgWf]VYX F Ygci fWYg

 $\label{eq:hammer} $$H\Y'WcifgY'fYUX]b[g'UfY'cifbU`Ufh]WYg'UjU]`UV`Y'h\fci[\Y'BGK'']VfUfm'$$$

7 cifgY 9**7 cilifogY**6 **9** jb XU8 YJJM**jc b**a **Uhb X 8 Yj Y`cda Ybh**

 $A m9I dYf]YbWY "gi fj Ymg" UfY "h\Y" df]a Ufma YUbg" Zcf" ghi XYbhg "hc" dfcj]XY" ZYYXVUW_"hc "h\Y" Wci fgY "Wcbj Ybcf" \\$

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

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

Image: Ybwci bhYf'U'dfcV'Ya k \Yb'UhYa dhjb['hc'gi Va]hmci f'Ugg][ba Ybhh\fci [\'Hi fb]h]bz'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'''=\mathred{Image: Wa Jhmci f'Ugg][ba YbhXi Y'hc'U'ZJi 'hk]h\'Hi fb]h]b'mci 'a UmUdd'm\mathred{Image: Wa Jhmci f'Ugg][ba YbhXi Y'hc'U'ZJi 'hk]h\'Hi fb]h]b'mci 'a UmUdd'm\mathred{Image: Wa Jhmci f'Ugg][ba YbhXi Y'hc'U'ZJi 'hk]h\'Hi fb]h]b'mci 'a UmUdd'm\mathred{Image: Wa Jhmci f'Ub'Y! hYbg]cb\mathred{Image: Wa Jhmci h\Yf'f'Y'j UbhXcW a Ybhg\mathred{Image: Wa Uj''9! hYfbU''Gi ddcfhmci 'k]'`

JbWi XY'Ug'Yj]XYbW' hc'gi ddcfhmci f'Y! hYbg]cb'Udd']\wUh]cb"'\mathred{Image: Wa Uj''9! hYfbU''Gi ddcfhmci 'k]'`

Ui hca Uh]\wU'`mfYW']j Y'U'h]\w_Yhbi a VYf\mathred{Image: hY'Yd\cbY'mci 'k]\tag{Y}\wu''mug_'\mathred{Image: Wa'\mathred{Image: hY}\wu''mug_'\mathred{Image: hY}\wu''mug_'\mathred{Image: hY}\wu''mug_'\mathred{Image: hY'Yd\cbY''mci 'k]\tag{Y}\wu''mug_'\mathred{Image: hY'\mathred{Image: hY'\mathred{I

; YbYfU``mž'UggYgga YbhiHug_g'a i ghVY'gi Va]hhYX'Y`YVWfcb]\W)``mij]U'Y]h\Yf'Hi fb]h]b'cf'U'A ccX`Y Ugg][ba Ybh'' =b']bgHJb\W'g'k \YfY'h\]g']g'bchdcgg]V`Yž']hk]```VY'gHJhYX'cb'mci f'\\circ i fgY'g'A ccX`Y'g]hY'k]h\U`hYfbUhjj Y'gi Va]gg]cb'XYHJ]`g''

cfi]bZcfa Uhjcbicbi\ckihcigi Va]hUgg][ba Ybhgicbi]bYij]UiA ccXiY.i\hdg.#gh XYbhi bgk "YXi "Ui #\ck! gi Va]hUgg][ba Ybha ccXiY

5 WUXYa]W<cbYglmUbX D`U[]Uf]ga

D`U[]Uf]ga i]gii g]b[ih\Yik cfXgicfi]XYUgicZch\YfgiUbXidfYgYbh]b[ih\Ya iUgimci fick b"i±i\WbihU_Yia Ubm Zcfa gžZfca iXYi]VYfUhYiW\YUh]b[ihciU\W]XYbhU`m\Wcdm]b[iZfca iUigci f\Wik]h\ci hiU\w_bck iYX[Ya Ybh'

I BGK '[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 hcf']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']bWi XYg'Wcdm]b['a UhYf]U`gž']XYUg'cf'WcbW'dhg'Zfca 'U'Vcc_ž'Ufh]WYž fYdcfhcf'ch\Yf'k f]hhYb XcW a Ybhz'dfYgYbhUh]cbž'Wca dcg]h]cbž'Uffk cf_ž'XYg][bž'XfUk]b[ž'W]fWi]hfmž'Wca di hYf dfc[fUa 'cf'gcZk UfYž'k YVg]hYž']bhYfbYhz'ch\Yf'Y`YWfcb]WfYgci fW'z'cf'Ubch\Yf'dYfgcbfg'Ugg][ba Ybhk]h\ci h Uddfcdf]UhY'UW_bck 'YX[Ya Ybh''

₺Uddfcdf]UhY 'dUfUd\fUg]b[.'

5 WUXYa]W + DZcfa Uhjcb

8 i Y 'hc 'Yj c'j]b['UXj]WY 'VmB GK '< YU'th žighi XYbhg'a i gh'WkYW_'Zcf'i dXUhYX']bZcfa Uh]cb 'fY[UfX]b['cb`]bY 'YUfb]b['Zcf'U``'5fhgž'8 Yg][b 'UbX'5fWk]hYWhi fY 'Wci fgYg'th]g'thYfa 'fJ]U'A ccX`Y'cf'Wci fgY']bZcfa Uh]cb dfcj]XYX"Ł

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