

Fj Zhi ^dc>9°Y, ) - X([Y

6hhZhnb Zci	I Zhi	9db V^c	H^ 'aa	9^ Xj 'an
H6l	GZWY'c\ VcY'L gf'c\	æ[dgb Vi ^'dc VcY Y'ZVh	æ[ZgZcXZh	

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## 2.1

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FV[ b\_Tef'g' bhZ[ g[ V' Vb\_XVgba'j Tf'j beg' \_Xff'g'g'g' X' Zg' Xa \_TgXeXT\_nXWg' Tg'gj Tf'cbgXagT\_ i T\_hTU\_Xl'G[ V'  
fhZZXf'g'g' TgfV[ b\_Tef'j XagYeb` VWfeXZTeWaz'Xc[ X' Xet'g'p'eXVbZa'vmaZ'g' X'e'hfXyh\_aXff!

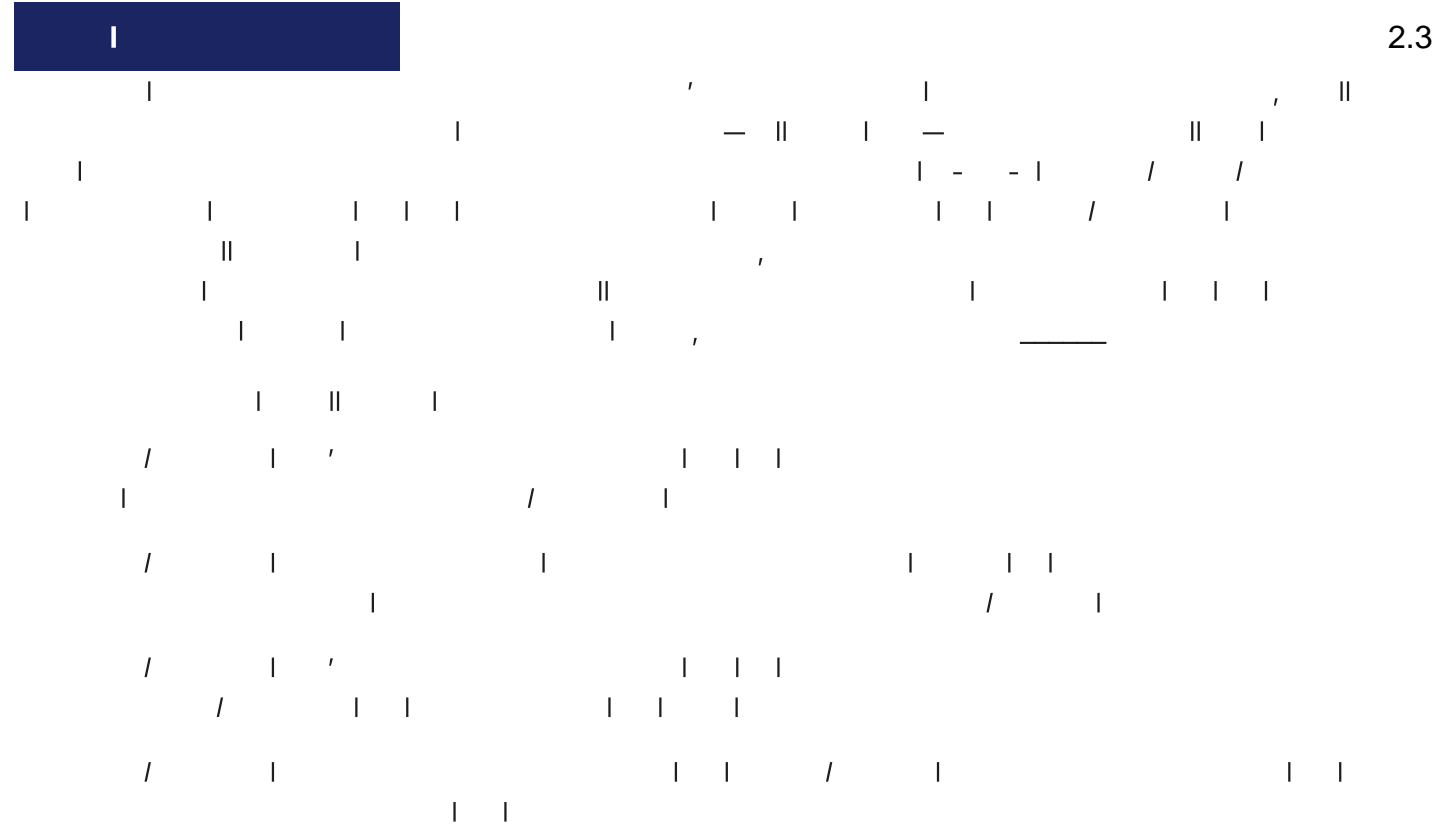
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=b[ a[fa f`\_TeZXVb\_XVgba`bYXc[ X` XeT`UTV^`a`\$`)+zf[bj X'VTa Tffh` X'g[ TgVbagX` cbeTel [ `f[geTaf  
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fhccbegXW'G[ X'gKkggX\_f'hf'g[ Tg[~~B~~kYbeWHA`i Xef'g[ f`5bW\XTa`?`UeTel TVdh`eXWg[ X'Vb\_XVgba`Z`Jhg`gaXi Xe  
fhZZXf'g[ Tg'gj` Tf T V[ T\_XaZX`g Vb`fb!6[ b\X'6 `f `aVbeeXVg[G[ `f `aYXeXaVX`fa'gf hccbegXW'G[ X'gKkgTVghT\_  
fhZZXf'g[ X'bccbf`gX`g[ X'XkT` c\_XbY=b[ a[fa f`Vb\_XVgba`\_XaW`fhccbegbTeZh` Xa'g[ TgXc[ X` XeT`VbXf  
[ b\_Wi T\_hX`YbefV[ bTef!

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Fj Zhi ʔdc°9YW, +[Y\*

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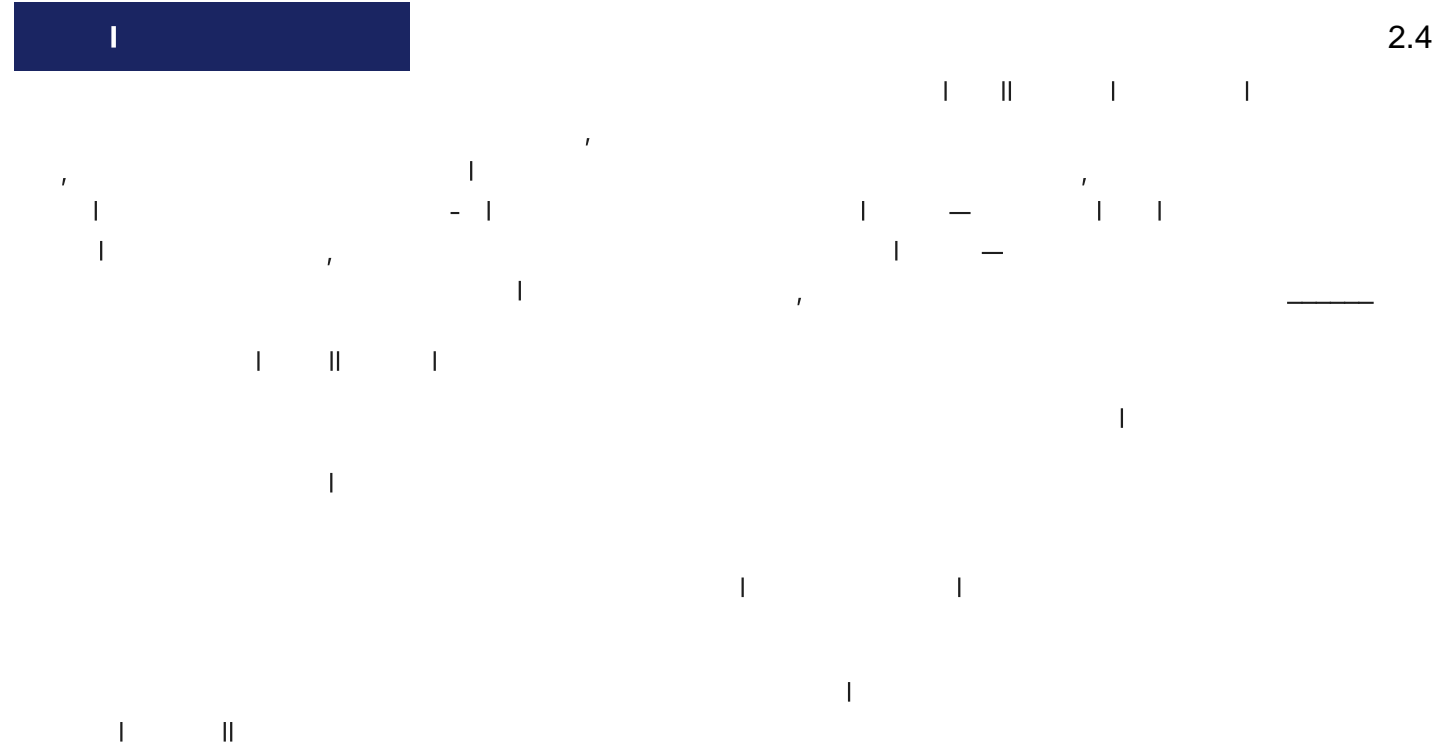
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' TgX'f'Yeb' \_bVT\_cbch\_Tgbaf!

6[ b\WX'4'f'aVbeeXVg'J X'Wba'g[ Ti X'Tal 'aYbe' Tgba fhZZXfgaZ'g Tgg' V'ceX\XeXaVX'WfTccXTefZfb'g' XeX'f'ab  
UTf'f'Ybe'g' V'aYXeXaVX!'6[ b\WX'5'f'aVbeeXVg'4\_g bhZ[ 'g' X'cTffTZX'WfVhffXf'g' X'ah' UXebYUXZZ'aZ VT\_f  
' TWX'a'eXfcbafX'g'i Te'bhf'9[ / cb\_XhVT\_WT\_XVg'Zab' Xagba'f' TWX'TUbhg'g' XT' bhagbYbbWeXVXi XW  
UTfXWba'WT\_XVgceX\XeXaVX!'G[ XeX'YbeXZ'g' XeX'f'ab'UTf'f'Ybe'g' V'aYXeXaVX!'6[ b\WX'7'f'aVbeeXVg'G[ XeX'f'ab  
' Xagba'a'g' X'cTffTZX'bY' Xg' bW' bYbg' Xe'g' cXf' bY\_bVT\_fbaZU'eWZfb'g' XeX'f'ab'UTf'f'Ybe'g' V'aYXeXaVX!

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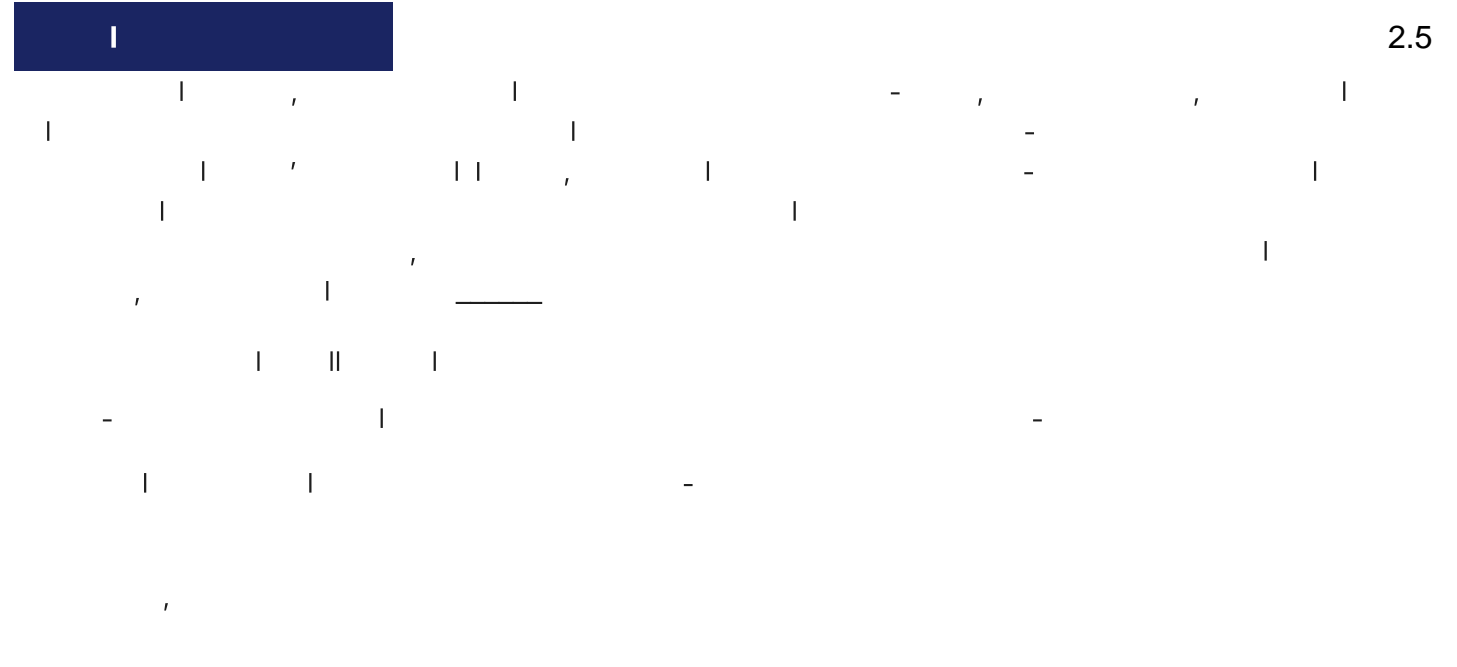
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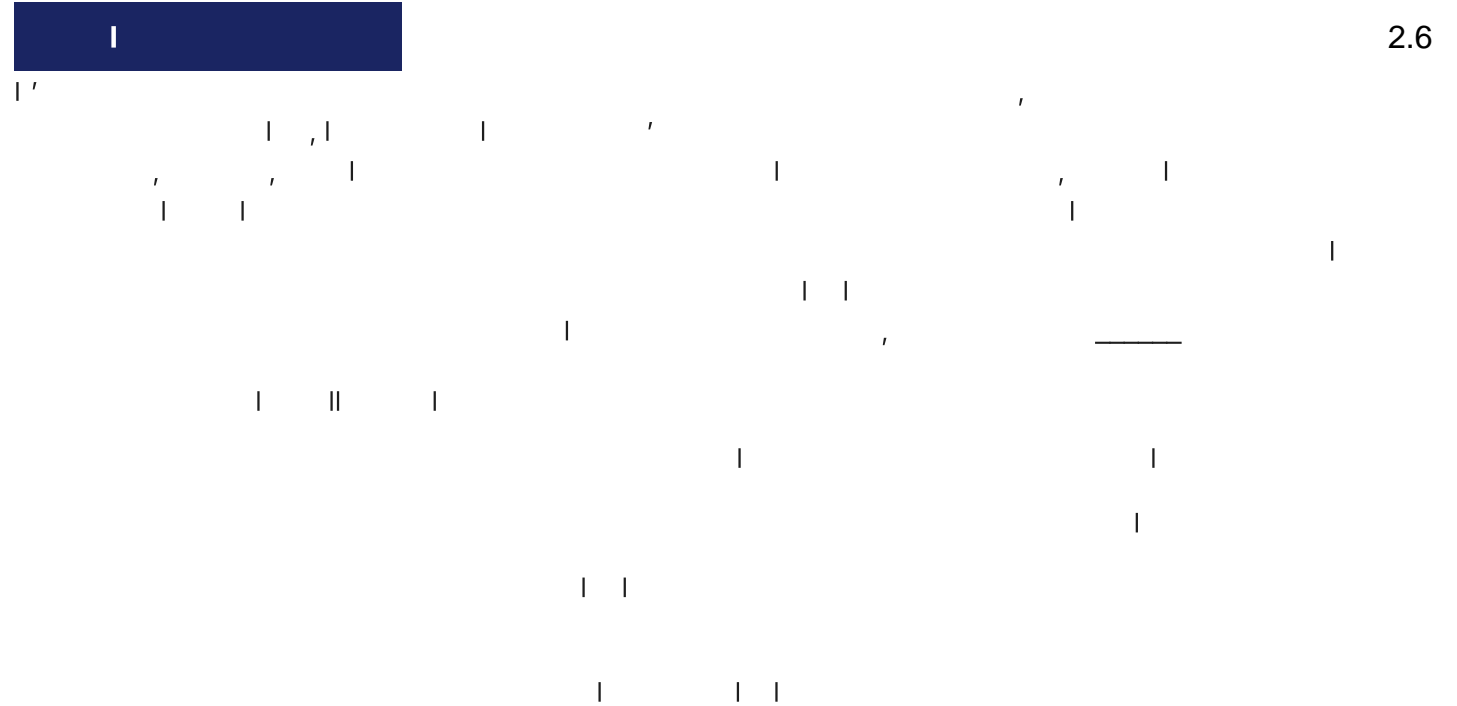
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6[ b\WX'4'f' 'a'VbeeXVgUXVThfX'g' X'#\$EaWaZ'g' Tgd' X'a^ hfXWg' Wtj 'g' Xl' 'a\_TaW@Tc'j Tfa'gTi T\TJ\_X'hag\_ g' X'XTe\_ '\$ ##f WbXfa'g' c\_ 'g' Tg8hebcXTaf' 'a'g' X' WZ\$ ##f Vbh\_Va'g' [ Ti X'^abj a TUbhg'g' XXTfgXea VbTfgbY Abeg' '4' XeVT!J [ \X'g' V' EaWaZ'fhZZXf'g'g' Tgd' X' Tc Vbh\_Va'g' [ Ti X'UXXa VeXTgXWa'g' X' WZ\$ ##f Žg WbXfa'g'ceXV\_hVX'g' X'cbffV\\_\g' 'g' Tg8hebcXTaf' 'aXi Xeg' X\_Xff' [ TW^abj \_XWZX' TaWcXe[ Tcf' Xi Xa Wex' 'bg' Xe ' Tcf'g' TgTeX'ab\_baZXe'a XkVfgXaVX'beTeXl Xggb'UXWfVbi XeXWUl 'eXfXTeV[ Xef' bYg' XXTfgXea VbTfgbY ceXfXagWTl 'Abeg' '4' XeVT Tf'XTe\_ Tf'g' X' WZ\$ ##f!6[ b\WX'6'f' 'a'VbeeXVgUXVThfX'g' XeXf' 'abg' 'aZ' 'a'g' X'gXkg g' Tgf'hZZXf'g'g' Tgd' X'#\$WfVbi Xel' bYg' X'ceXfXaVX'bYggTa'h' Wbk\WX'a'g' X'a^ hfXWg' Wtj 'g' Xl' 'a\_TaW @Tc VThfXW?X' TI ŽMI Tgf ŽTaW5Xnne'gb'dhXfgba'be'eXTV[ T'aXj 'VbaV\_hf'ba TUbhgj [ Xa' Tc' T^Xef' UXZTa hf' 'aZ' 'a^ VbagTa'Z'g'gTa'h' Vb' cbhaWf'!<afgXTVŽg' X'gXkg'aVWTgXf'g' TgggTa'h' Wbk\WX'j Tfa'ghfXW'a' 'a^ UXYbe'g' X'XTe\_ '\$ ##f!G[ V'^abj \_XWZX'\_XWg' X'gX' 'gb'VbaV\_hVX'g' Tgd' X' TcŽj [ W[ j Tf Wtj a' j 'g' 'a^ VbagTa'Z'g'gTa'h' Wbk\WX'ŽVbh\_Va'g' [ Ti X'UXXa VeXTgXWa'g' X' WZ\$ ##f!6[ b\WX'7'f' 'a'VbeeXVgUXVThfX T\_g' bhZ[ 'g' X'gXkgWbXfa'g'aVWTgX'g' Tg?X' TI ŽMI Tgf ŽTaW5XnneXfgTU\_f[ XWTa XkTVgWTgX'Ybe'g' X'VeXTgba bY



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6[ b\X'7 'f'g' X'UXfgTafj Xe'G[ X'cTffTZX'gK\_f'hf'g' TgcTegW'cTag'j XeX'¼ beX'g' Ta'fXi Xa'g' Xf'\_^X\_Xe'gb V[ TeTVgXenX'g' X' bWEXWfbaZf Tf [ Ti 'aZ'fj 'aZ'g' Ta'gbV[ TeTVgXenX'g' X'beZ'aT\_i Xef'vaf Tf [ Ti 'aZ'fj 'aZ!½ 5XVThfX'g' X' bWEXWfbaZf [ TWUXXa V[ TaZXWUI T\_gXeaZ'g' X'g' 'aZ'bYg' X'Wbj aUXTg' TaWbYUXTg'Žg' V' fhZZXfg'g' Tgd' X'g' 'aZ'bYVbj aUXTg' TaWbYUXTg' TI 'c\_TI T'VehVT'\_eb\_X'a ZV 'aZ'T'fbaZ'fj 'aZ!

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Vi \\_mTgba!G[ X'g'kgXfgTU\_f[ Xf'g' TgTeV[ TXb\_bZVfg' [ Ti Xa'g'UXXa TU\_X'g'b'ag'keceXg'g' X'<aWhf'E'V'Xe'i T\_Xl  
Vi \\_mTgba'f'j' e'gaZ'f'l'fg'k' 'Uhg[ Ti X'aXi Xeg' X\_Xff TVdh'eXW'aYbe' Tgba TUbhg'g' X'Vi \\_mTgba'g' ebhZ[  
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Vi \\_mTgba'f'Vhfg'b' f TaWVb' ' ha'g' beZTa'mTgba'Yeb' [ 'f'gbeVT\_TegYTVg'f'hZZXfg'g' Tg'g'V'a'gaXVXffTel'g'b  
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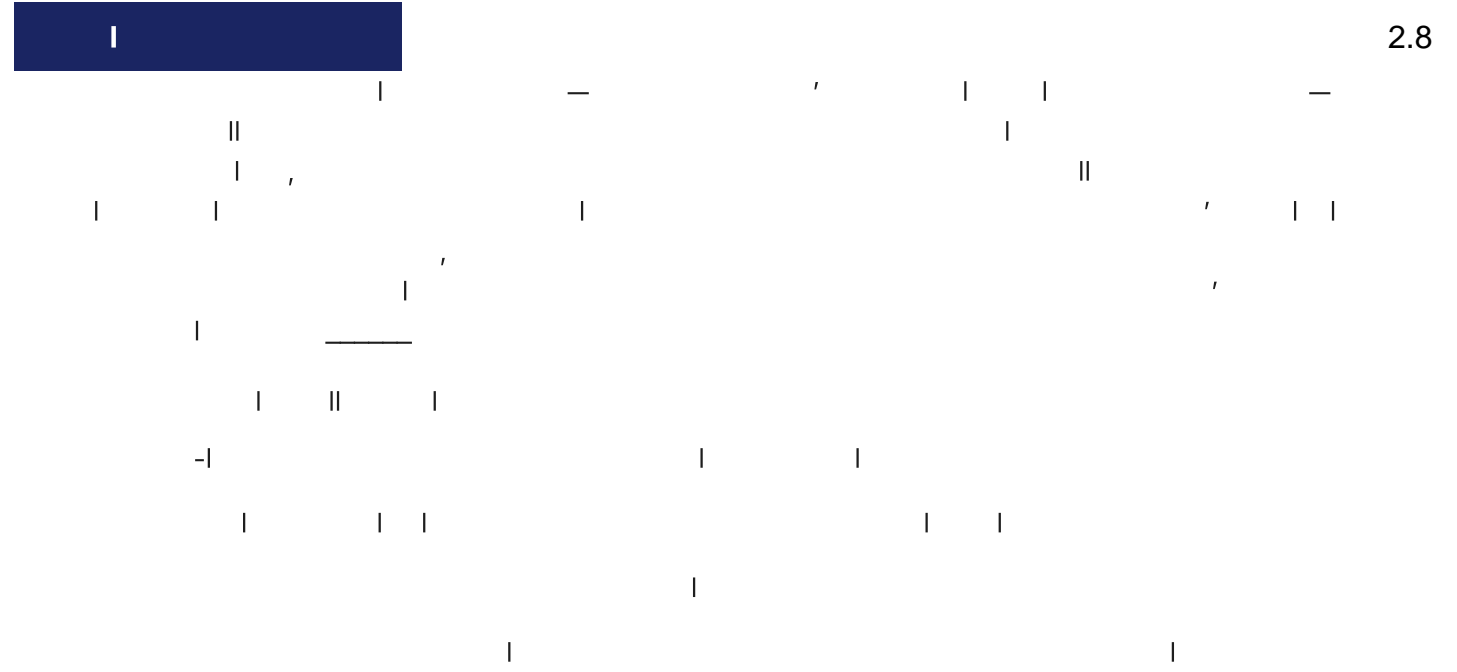
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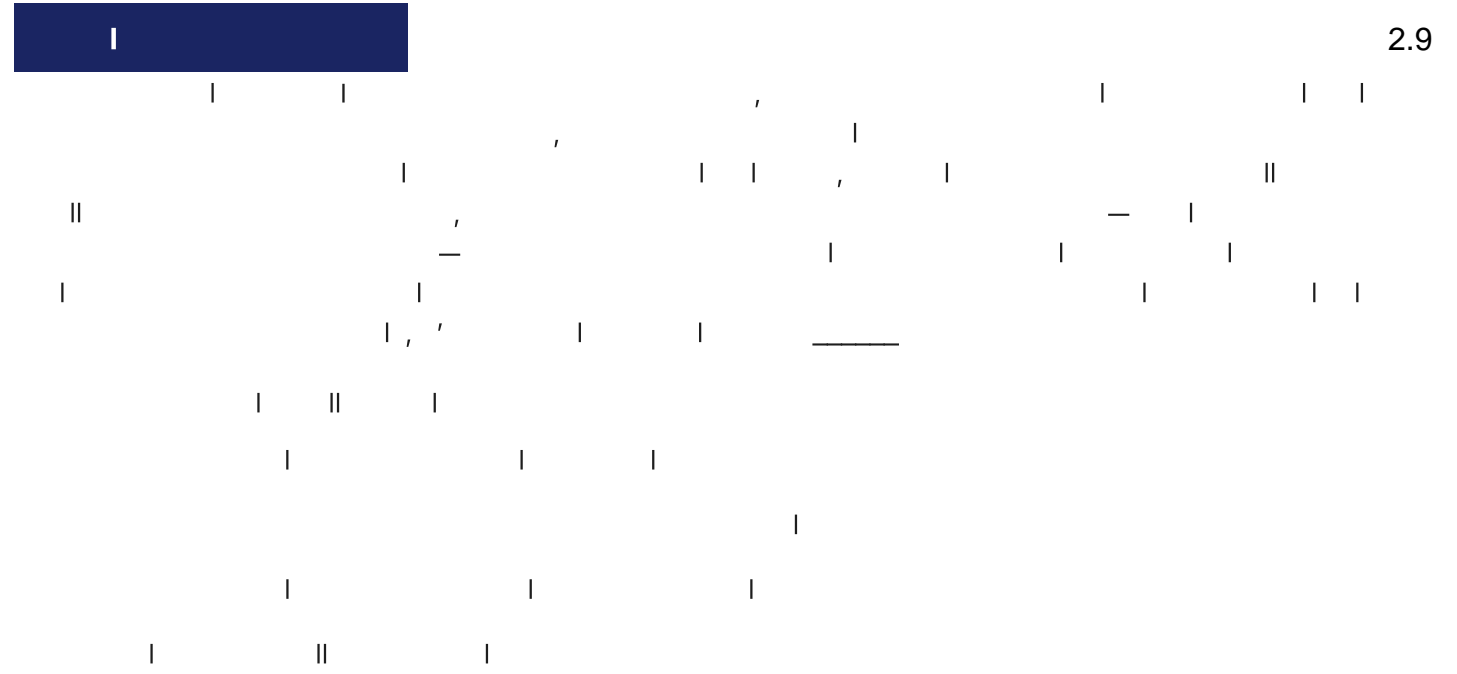
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1/4 bV\Kea'ebV^f Ybe' XW'a T'fhUW'hVgba'fXgg'aZ'Z' X'VTa'a'Xe'g' TgfhUW'hVgba'Z\_\^X'cebVXffXf' hfg[ Ti X'UXZha  
bWheeaZ'a'g' X'4VTfgf': aXVf'6b' c\_Xk'Ul'g'f'g' X!

6[ b\X'5'f'aVbeeXVg'J X'ba\_ ' ^abj TUbhgZXb\_bZWT\_c'ebVXffXf Tgg' X'4VTfgf': aXVf'6b' c\_Xk'Zfbj X'Wb'abg  
[ Ti X'aYbe' Tgba'gb' T^X'aXeXaVXf TUbhgZXb\_bZWT\_c'ebVXffXf'a'ZXaXeT\_!4\_f'bZabgVX'g' Tgg' X'ebV^f W'gkWgb  
' !#%Ul T'j XeX'YbhaW'gb'f'g'\_UX'Ybe' XW'a T'c'h' X'fXgg'aZ'Z'f'g' X'geTaf'g'ba' hfg[ Ti X'[ TccXaXWTY'Xe'g'f'g' X!  
6[ b\X'6'f'aVbeeXVg'G' XeX'f'ab' Xagba'a'g' X'cTffTZX'bYj [ Tgcebc'begba'bY'g' X'ebV^f'j'g' 'a'4VTfgf': aXVf'  
6b' c\_Xk'j XeX'Ybe' XW'g' ebhZ[ 'fhUW'hVgba'Z'f'g' XeX'f'ab'UTf'f'Ybe'g'f'f'a'XeXaVX!6[ b\X'7'f'aVbeeXVg'G' X  
cTffTZX'W'fVhffXf'i Tebh'f'ebV^f'a'g' X'4VTfgf': aXVf'6b' c\_Xk'g' TgTeX'W'gkWgb'W'X'XeXagcXe'bW'f'bY'g' XZUhg  
abg' aZ'a'g' X'cTffTZX'f'hZZX'f'g'g' Tgg' X'fX'W'gXf TeX'bej XeX'j ebaZ!

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6[ b\X'7 'f'g' X'UXfgTafj Xd'G[ X'cTffTZX'gK\_f hf'g' Tgg' X'WV\_TeTgba j Tf'j e'gga 'a T\_JaZhTZX\` cbegTaggb  
8hebcXTa Wc\_b` TVI 'Uhgabg` bfg; T'gTafZ'fgT'gXf'g' Tgg' X'WV\_TeTgba 'aV\_hWkW'T'eXTffheTaVX'gb'g' X'Ha'gKW  
FgT'gXfZ'TaW' TWK\` c\_\VgeX'XeXaVXf'gb'Vb\_baWf'a'g' X'4` XeVTf!5XVThfX'bYg'X` X'ffTZXf'j' g' 'a'g' X  
WV\_TeTgba'g' Tgj XeX'\_TeZX\_ 'æX\_Xi Taggb'g' X; T'gTa'cXbc\_XZj XVTa Tffh` X'g' Tgg' X; T'gTa'cXbc\_Xj XeX'abg  
g' X'ba\_ ThVXaVX'be'g' V' VbVh` Xag

6[ b\X'4 'f' 'aVbeeXVg'G[ XeX'f'ab` Xagba 'a'g' X'cTffTZX'bYf\` \\_TeWbVh` Xag' 'a'bg' XeVbhag'WfZ'fb'g' XeX'f'ab  
UTf'f' 'be'g' V' 'aXeXaVX!6[ b\X'5 'f' 'aVbeeXVg'4\_g' bhZ[ 'g' XeX'f'Ta\` c\_\VgeX'XeXaVX'gb'8hebcXTa Zbi Xea` Xagf  
j [ Xa'g' X'cTffTZX'WfVhffXf' [ bj 'g' X'WV\_TeTgba j Tf'j e'gga 'a'9eXaV[ Z'j [ W[ j Tf'hfXWg' ebhZ[ bhg8hebcX  
Tf'g' X'\_JaZhTZX'bY'agXeaTgbaT\_Wc\_b` TVI Z'g' XeX'f'ab'WfVhff'ba'bYg' X'9eXaV[ Zbi Xea` Xagf'eXfcbafX'gb'g' X  
WV\_TeTgba!G[ XeX'beXZ'g' XeX'f'ab'UTf'f' 'be'g' V' 'aXeXaVX!6[ b\X'6 'f' 'aVbeeXVg'G[ X'cTffTZX'WbXfa'g' Xagba  
g' X'cbch\_Te'g' bYg' X'eXi b\_hgba TaWV\_TeTgba T` baZ'g' X; T'gTa'cXbc\_XZ'fb'g' XeX'f'ab'UTf'f' 'be'g' V'  
'aXeXaVX!

DhXfgba '7\VEVh\_g -@XWWh`

Fj Zhi ^dc>9\*, \*Z+, Y[

6hhZhnb Zci	I Zhi	9db V^c	H^ aa	9^ Xj an
H6l	GZW^c\ ^cY^L gf^c\	xc[db Vi^dc^VcY ^ZVh	xc[ZgZcXZh	

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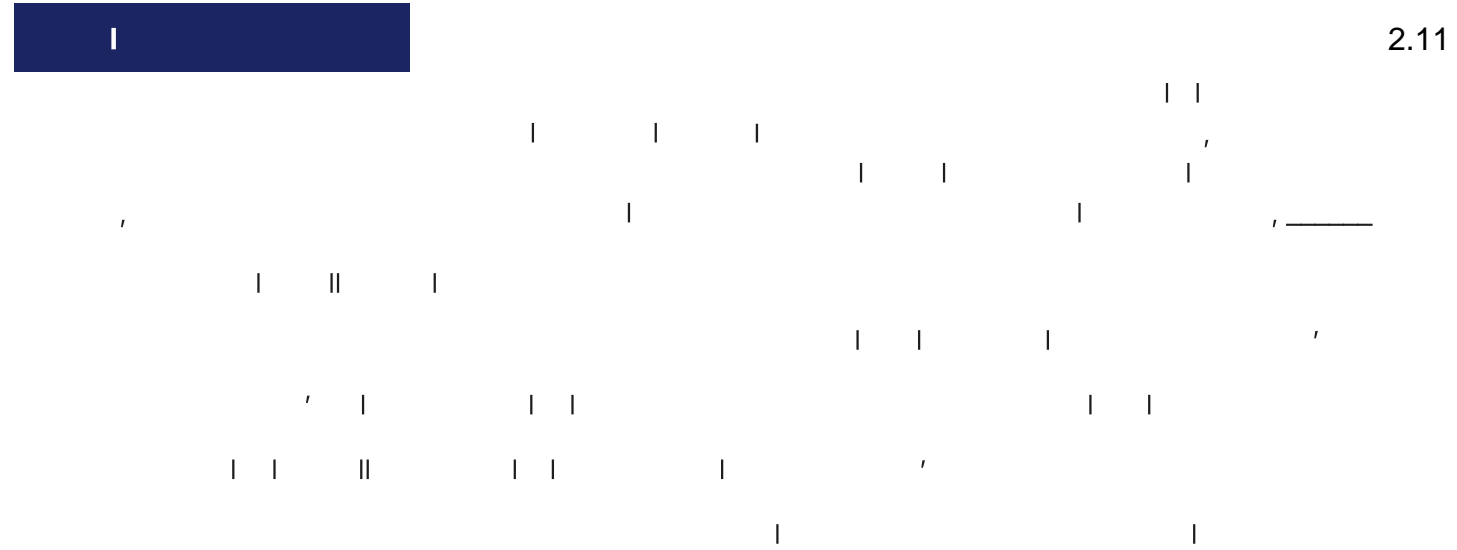
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F`aVX`g`X`VW\_TlXWg`\_`aZ`[TWg`X`XYXVgbYV[ TaZ`aZ`g`Xf`nX`bY8Teg`\_`a`g`Xf` h\_Tgba`eX\_Tgi`X`g`8Teg`f`eXT`  
f`nXZ`g`eXTfbaTU\_X`g`VbaV\_hVW`g`Tgd`X`g`\_`aZ`bYg`X` VVVX`e`aZ`f`Ybe`Tgba`j`Tf`\_`cbegT`ag`a`VWgXe`\_`a`aZ`  
8Teg`f`Xi`XachT`f`nX!N

6[ b\X'4 'f\`aVbeeXVg'4\_d' bhZ[ 'd' X'g'kgXkc\_T'af'd' Tgj [ Xa'd' X'eXfXTeV[ Xef' W\Tl XWg' X'Ybe' Tgba'bYg' X  
` WWWX'eZ'a'baX'f\` h\_TgbaZ'd' X'f'nX'bYg' X'aX'e' bf'gc\_TaXg'j' Tf TYXVgXWfj [ W[ 'fhZZXf'g'd' Tgd' X` WWWX  
eZ'\_^X\_l' Ybe' XWXTe\_Xe'd' Ta'g'WVWa'd' f'f\` h\_TgbafZ'd' X'g'kgWbXfa'g'a'WVTg'X'd' Tgd' f'j' Tf Ta'a'gT\_  
f\` h\_Tgba'f'd' Tg'fZT'f\` h\_Tgba'd' Tgj' Tf Vba'W'hVgWUXYbeX'bd' Xef\` h\_Tgbaf!'@beXbi'XeZ'd' X'g'kg` T^Xf'ab  
eXXeXaVX'p'd' X'fcXW'E'VeXf'h'd' bYTaI' 'bd' Xef\` h\_Tgbaf.'d' XeX'YbeXZ'd' XeX'f'ab'UTf'f' YbeVb` cTeZTaI



Fj Zhi ʔc°9) - \*. + V+

6hhZhhb Zci	I Zhi	9db Vʔc	H ʔaa	9^ Xj ʔn
H6l	GZWʔc\ VcYʔL gʔʔc\	ʔc[dgb Vi ʔc VcY ʔZVh	ʔc[ZgʔcXZh	



I

6beeXVg4afj Xe-4

ETgbaT\_X

6[ b\X'4 'f g' X'UXfgTafj Xe'UXVThfX'gceXfXag' g' X'VbaV\_hf'ba' g' Tg' bfg\_bZWT\_ 'Yb\_bj f'Yeb' g' X'gkkgf WfVhff'ba' bYg' X'4eTUT'GXeeT'eXZ'ba' bY@Tef! 4VbeWbaZ' gb' g' X'gkkg'g' XeXTeXVeTgXef' 'a' 4eTUT'GXeeT' g' TgVbh\_W UX'g' X'exfh\_gbYi b\_VTaWTVgi' g' ZTaWeXfXTev[ Xef[ Ti X'YbhaWXi WKaVX'bYTf[ Wkcbf'g' Vbaf'fgXagj' g' T'TeZX Xehcgbal'G[ X'gkkgZbXf'ba' gb'abgXZ[ bj Xi XeZg' TgXebf'ba' TaWbg' Xe'Xi Xag' Vbh\_W[ Ti XT\_gXeXWg' X'fheTVX'bY @Tef!G[ 'f bUfXeI Tgba' fhZZXfg' g' TgVheeXagVbaWgbaf'ba' @Tef'f'fheTVXTeX'abgaXVXffTe\_ T'eX\_TU\_XZhWk gb'cTfgXi Xag'f'f' b' Xf'Zaf' bYcTfgXi Xag' Vbh\_W[ Ti X'UXXa'geTaf'Ybe' XWbeXeTfXWXageX\_ f'TaWg' hf' g' X VheeXag' T^Xhc' bY4eTUT'GXeeT' Ti 'abgTVWheTg\_ 'eXl XVgcTfgi b\_VTaWTVgi' g' !N

6[ b\X'5 'f 'aVbeeXVgUXVThfX'g' X'gkkgfhZZXfg'ba' g' TgcTfgXi Xag' Vbh\_W[ Ti XV[ TaZXW@Tef'f'fheTVX'fhV[ g' Tg'g' VheeXagTccXTeTaVX'fa' gT'eX\_TU\_XZhWk gb'cTfgTVgi' g' Zabgg' Tg'g' \_^X\_ g' TgcTfgXehcgbaf' j Xe'abg Tf' Tf'f' X Tf Tf'gbab' Xef'ceXi 'bhf\_ 'UX\_Xi XW'A bg' 'aZ' 'a' g' X'gkkgfhccbeg' T'VbaV\_hf'ba' TUbhg'g' X'\_^X\_ 'f'vX bYcTfgXehcgbaf'!N[ b\X'6 'f 'aVbeeXVgUXVThfX'g' X'bUfXeI Tgba' g' TgeXfheTVaZ'Xi Xag' Vbh\_W[ Ti XV[ TaZXW g' XTccXTeTaVX'bY@Tef' WbXfa'g' c\_ g' Tgg' XTf[ WfVhffXW'a' g' X'gkkg'\_^X\_ VT' X'Yeb' h\_gc\_Xi b\_VTabXf! 4\_g' bhZ[ 'g'f'cbffW\_X'g' Tgg' XTf[ VT' X'Yeb' WXXeXagi b\_VTabXfZg' XeXf'ab' 'a'Ybe' Tgba' 'a' g' X'gkkgfhccbegaz T'VbaV\_hf'ba' TUbhg[ bj \_^X\_ g' TgcbffW\_X'g' 'f'f'N[ b\X'7 'f 'aVbeeXVgUXVThfX'abg' 'aZ' 'a' g' X'gkkgfhZZXfg' g' Tgg' X'4eTUT'GXeeT'VeTgXef[ TWgb[ Ti X'UXXa'VeTgXWUI'f'b' Xg' 'aZ'bg' Xe'g' Ta' i b\_VTaW'Xehcgbaf'!4\_g' bhZ[ g' X'gkkgWbXf' fhZZXfgg' Tgg' X'Xi WKaVX'Vbaf'fgXagj' g' i b\_VTaW'Xehcgbaf'f[ bh\_Va'gUX'g' ^Xa Tf WXE'a'gi X cebbYbYcTfgXehcgbafZg' TgWbXfa'g' XTa' g' Tgg' X'VeTgXef' Vbh\_Va'g[ Ti X'UXXa'VeTgXWUI' XehcgbafZba' g' Tg j XVTa'gUX'VXeg' 'a' g' Xi j XeX!N

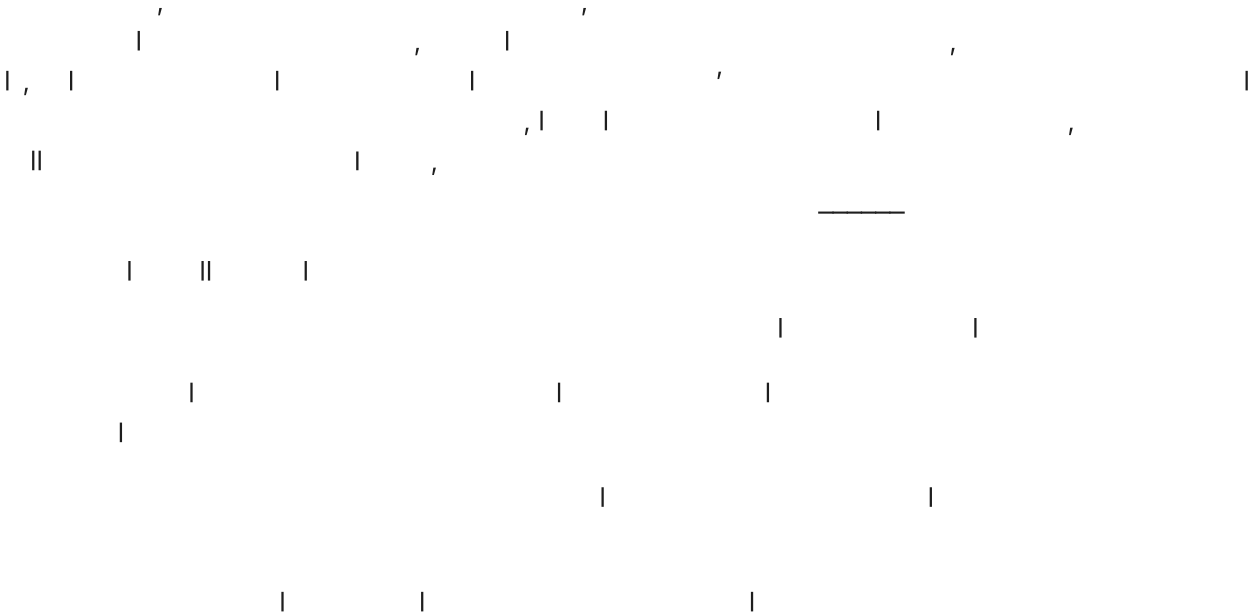
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Fj Zhi 'dc°9° . . X\* (%

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H6I	GZWY'c\ 'VcY'L gf'c\	xc[dgp Vi 'dc'VcY >ZVh	xc[ZgzcXZh	

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2.12



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ETgbaT\_X

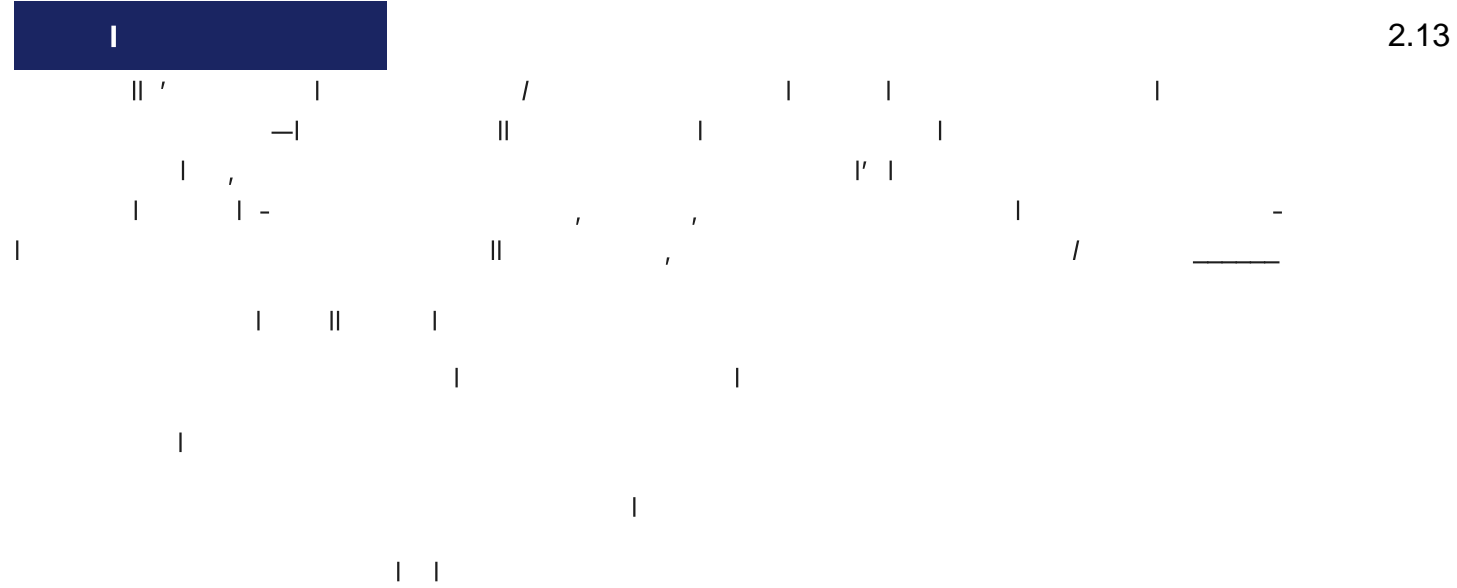
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6[ beXbZeTc[ Xef'bYg'a'gK\_f'gbeXf'g' eohZ[ WTaVXZfb'g' Xi TeXT\_fb'VbaVXeaXWj 'v' f'gdel gK\_aZTaW  
V[ TeTVgXemTgba!G[ 'f'fhZZXfg'g' Tgg' X'YTVgg' TgV[ beXbZeTc[ Xef'fXX^'g' X[ X\_c'bYWeT` TgheZXf'j 'v' g' X  
f'gdel gK\_aZTfcXVg' bYg' XeWTaVXf'f[ bh\_WUX'Wafhece'f'aZ!½

6[ b\X'4'f'f'aVbeeXVg'G[ 'f'f'aYXeXaVX'f'a'gfhccbegXW'G[ X'UXZ'aa'aZ'bYg' X'gKkgWbXf'\` c\_] g' Tgg' 'f'f'gghXZUhg  
g' X'XaWf'\_XTW'aZ'g'bT'VbaV\_hf'baTUBhg[ bj` V[ beXbZeTc[ Xef'hfXW'eT` TgheZXf!6[ b\X'6'f'f'aVbeeXVg'G[ 'f'  
'f'aYXeXaVX'f'a'gfhccbegXW'G[ X'gKkg'aXi Xe` Xagbaf'WTaVXf'UI` V[ beXbZeTc[ Xef'j` [ b'Wba'g'aVbecbeTgK'aTeeTgi X  
X\_X` Xagf!6[ b\X'7'f'f'aVbeeXVg'G[ 'f'f'aYXeXaVX'f'a'gfhccbegXW'G[ X'gKkg` Xagbaf'a'cTff'aZ'g' TgW'eXVg'bef'hfX  
W'eT` TgheZXf'g'b'VbaVhVgeXfXTeV[ ZUhg'g'aXi Xe'fhZZXfg'g' TgW'eXVg'befTaWTVg'befTeX'g'bb'eX\_Tagba'g' X` !4\_f'bZ  
g' X'gKkg'f'\_XTW'aZ'g'bT'VbaV\_hf'baTUBhg[ bj` V[ beXbZeTc[ Xef'hfXW'eT` TgheZXf!

DhXfgba'7\WVh\_g` -@XWWh`

Fj Zhi 'dc°9`VX[' [&+.

6hhZhnb Zci	I Zhi	9db V'c	H' 'aa	9^ Xj an
H6l	GZWY'c\ VcY'L g'f'c\	xc[dgb Vi'dc'VcY >ZVh	xc[ZgzcXZh	



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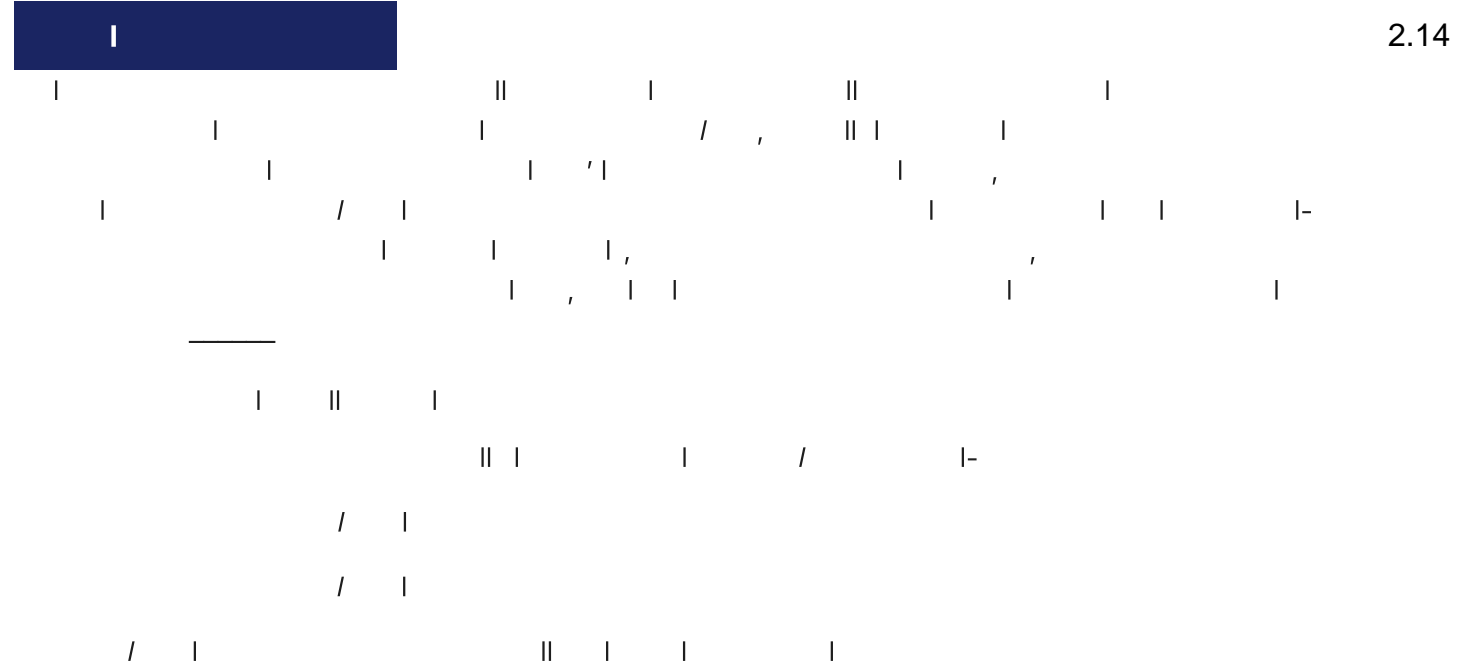
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abi X'\_G[ X'@ kdh\T[ hT\_J?XggXef'G[ X'gkkgf'g'g'g'g' Tg'g' X'abi X\_Vbaf'f'g' X'ag'eX\_ bY\_XggXef'Yeb' 'g' X'aTeeTgbe'g'  
[ XeYeXaW' T'Ybe' Tg'g' Tgfb' X'fghWka'g' eXTWaZ'g' X'abi X\_'a T'V\_Tff'YbhaWag' W'WgaZ!'4VbeVWaZ'g'g' X'gkkg'  
g' bfX'fghWka'g' T'fb'YbhaWg' X'abi X\_'f'g'eXTg' XagbYZXaWke'g'UX'b\_WYTf[ 'baXW'a' e'fcbafX'g'g' X'fghWka'g'  
VbaVXeaf'Z'g' X'e'cebXffbeX' c[ Tf'vXWg' X'abi X\_'f'eX\_Xi TaVX-'g'j' e'ggXa'a' bWka'zf'bhaWaZ'\_JaZhTZXTaW  
TWaXffXf'f'fhXf'g' Tg'f'g' TggX'e'G[ V'Z'a'ghea'Z'fhZZXf'g'g' Tg'G[ X'@ kdh\T[ hT\_J?XggXef'f' beX'eX\_Xi Tag'g'  
Vbag' cbeTel ThVWxVXf'g' Ta'g' TI 'a'g'T\_ f'XX' !

6[ b\WX'4'f'f'aVbeeXVgUXVThfX'g' X'cebXffbef' e'fcbafX'g'g' X'fghWka'g' ba\_ ' Xag'ba'f'G[ X'@ kdh\T[ hT\_J  
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g' X'cebXffbef' e'fcbafX'g'g' X'fghWka'g' Vb' cTeX'f'G[ X'@ kdh\T[ hT\_J?XggXef'g' Vbag' cbeTel 'abi X\_f' TUbhg  
YeXaW' [ 'c!' 6[ b\WX'7'f'f'aVbeeXVgUXVThfX'g' X'cebXffbef' e'fcbafX'g'g' X'fghWka'g' WbXfa'g'TWwXff'g' X'WXT'by  
eXTWaZ'g' X'abi X\_'f'\_XggXef' h\_gc\_X'g' Xf TaWa WwX'eXag'beVkef!

DhXfgba '7\VEVh\_g -@XWWh`

Fj Zhi ʔc°9°XVX-' [. W

6hhZhnb Zci	I Zhi	9db V'c	H' ʔa	9^ Xj ʔn
H6l	GZW'c\ VcY'L gʔ'c\	ʔ[dgb Vi ʔc VcY ʔZVh	ʔ[ZgʔcXZh	



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6beeXVg4afj Xe-5

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6[ b\WX'5'f'g' X'UXfgTafj Xd'5bg' Xkc\_JaTgbaf fhZZXfgg' Tgg' X'UTVgXeT'Vb' X'Yeb' 'g' X'fT' X'c\_TVX-X'g' Xe'g' XI Vb' X'Yeb' 'g' X'ZebhaWTaW' T^X'g' Xe'j TI 'gb'g' X'\_XTi XfZbe'g' XI Vb' X'Yeb' T'ubi X'g' X'ZebhaWTaW' T^X'g' Xe j TI 'gb'g' X'ebbgf!

6[ b\WX'4'f'f'aVbeeXVg'G[ f'f'aX'eXaVX'fa'gfhccbegXW'G[ X'g'kg'aXi Xe'WfVhffXf'Tal UXaX'g'f'bYTal '^aWbY UTVgXeT'6[ b\WX'6'f'f'aVbeeXVg'G[ f'f'vba' Vg'j 'g'g' X'g'kg'BaX'bYg' X'g' XbeXf'f'g' Tgg' X'UTVgXeT'a'g' X'\_XTi Xf j XeX'WXcbf'g'WUI 'eT'a'f'c'Tf[ 'aZ'bWf'b'j'6[ b\WX'7'f'f'aVbeeXVg'G[ f'f'aX'eXaVX'fa'gfhccbegXW'G[ X'g'kg'ba' VwVhffXf'f'aTgheT'j' bWhee'aZ'j'UTVgXeT'f'gaXi Xe' Xagbaf'X'g' Xe'g' X[ Te' f'be'UXaX'g'f'bYg' XfX'UTVgXeT!

DhXfgba'7\VEVh\_g' -@XWWh'



Fj Zhi ^dc>9°Y[+\*) V W

6hhZhnb Zci	I Zhi	9db V'c	H' 'aa	9^ Xj an
H6l	GZW'c\ 'VcY'L g'f'c\	xc[dgb Vi 'tdc 'VcY >ZVh	xc[ZgZcXZh	

9/Y(+\*) V W

0cZhVg`hb VahXVa!hZd"egciZY`b V\Vo`cZh#l ] Zn] VkZ`WZc`Vgdj cY`h`cXZ`i] Z`7a/X `afZgVgno`cZ; ~~g~~1 VhXgZViZY`c`i] Z  
& . ' %h#H`cXZ`i] Zc!o`cZh] VkZ`VeeZVaZY`idXgZVidgh`ald` c\ [dgVc`cZneZch`kZ [dgh`d [ZneZghh`dc`id`h] VgZ1 1] VhZaXi  
Vj Y`ZcXZ#O`cZ`XgZVidgh`d[iZc`b mVg`l 1] `hdXVaXdb b ZciVgnVcY`X] VaZc`Z`b V`chigZVb `Xj aj gZ#6i` ghi!i] Z`ciZgcZi  
VeeZVgZY`id`g`ea/XZ`i] Z`o`cZ!Wj`i`i] `hdar` [dgh`eZgh`hih#l dYVn`i] ZgZ`VgZ`Zcdj \] `o`cZh`c`i] Z`J`c1ZY`HiViZh`id`hj eedg`Vccj Va  
o`cZ[Zhi`kVah#l ] `h`hj \Zhih`i] Vi TTTTTT

L ] X] X] dXZ`b dhi`ad\ XVan`Xdb eaZiZhij ZiZm4

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7#oĉZh`Vg`hi`āV`b ZVc`ĉ\|j ā[dgō`d[Znēgzhh`dc#

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9#o^Zh`VgZ`ddY`hdj gXZh`d[`b V^chi gZVb `Xj aj gZ#

9/Y(+\*) V Wbch Zg

8dggZXi °6chl Zg/7

GVl ^dcVaZ

8] d'XZ'7'h'i] Z'VZhi'Vchl Zg'WZXj hZ'↑b dhi'ad\XVan[dadl h'[gdlb i] Z'Zimh'ed'ci'Wdj i'o'eZh'idYv# ] Z'Zim'YZhXg'WZh  
o'eZh'VhV[dgb 'd[ZnegZhh'dc'i] Vi'\dZh'WX' id'i] Z'& ' %h'VcY'VhhZgh'i] Vi'i] h'da'[dgb 'eZgh'hih#i] ] Z'Zim'i] Zc'cY'XViZh  
i] Vi'b j a'eZ'o'eZh'Zmhi'c'i] Z'J H'idYvVcY'i] Vi'i] Zn'Vg'edej a'gZcdj \ i'd'hj eedg'Vccj Va[Zhi'KVd\Ved'ci'i] Vi'hj \Zhih  
i] Vi'eZdea'Zxdci'cj Z'id'k'Zl 'o'eZh'VhV'b ZVc'c\j a[dgb 'd[ZnegZhh'dc#

8] d'XZ'6'h'cXdgZXi WZXVj hZ'i] ZiZm'h'ed'ci Wd'j i'Xj gZ'ci 'ciZgZhi'c'o'eZh'c'i] Z'J H'YdZhc i'ad\ XVan'hj \\Zhi'i] Vi'o'eZ  
XgZVidgh'XVc'gZXj V'd'gJdGvJ Y'ZcXZ'W'h'edhi'c'\\d'caCZ#] | ZiZm'i'c'Y'XViZh'i] Vi'o'eZh'j V'KZ'ad'c\\j VY'Vc'Vj Y'ZcXZ'V'cY'i] Z'gZ'h  
cd'c'Y'XVi'd'c'i] Vi'd'caCZ'edhi'h'j V'KZ'XVj hZY'i] Vi'Vj Y'ZcXZ'id'\\gd' Q] Z'gZ'h'cd'b Z'ci'd'c'd[ 'o'eZ'XgZVidgh'j hZ'd[i] Z'c'iZ'gZ'i Vi  
Vaz#8] d'XZ'8'h'cXdgZXi WZXVj hZ'i] Z'Y'ZV'i] Vi'o'eZ'XgZVidgh'XVc'Z'nead'g'cZ'i V'g'j[dgb h | ] 'Z'd'WZX'i kZan'ig Z' h'ci'ad\ XVan  
XdccXZiZY'id'i] ZiZm'h'Y'hXj h'h'd'c'd[ 'o'eZh'V'h'Vc'Z'm'i'c'\\[dgb 'd[ 'Z'ne'gZ'h'h'd'c'Z'i] Vi'd[iZ'c'c'Xj Y'Zh'Vg't'dgi] Z'ed'ci'i] Vi  
o'eZh'V'gZ'hi'\\iedej a'gZcdj \\j 'c'i] Z'J H'id'hj eedg V'ccj Va[Zhi kVan#8] d'XZ'9'h'cXdgZXi WZXVj hZ'i] Z'ed'ci'i] Vi'o'eZh'V'gZ  
edej a'gZcdj \\j 'c'i] Z'J H'id'YVn'id'hj eedg V'ccj Va[Zhi kVan'YdZhc i'ad\ XVan'hj \\Zhi'i] Vi'o'eZh'egZ'hZci'b V'chigZVb 'Xj aj gZ  
tdgVgZ'i] Zb hZakZh'b V'chigZVb tCb dgZdkZgi] ZiZm'hiViZh'i] Vi'o'eZ'XgZVidgh'd[iZ'c'Xj Vaz'c'Z'b V'chigZVb 'Xj aj gZ#

Fj Zhi^dc°9^ Xj añ/B ZY↑ b

Fj Zhi ^dc °9° \* [X' \* ()

6hhZhnb Zci	I Zhi	9db V'c	H' 'aa	9^ Xj an
H6l	GZW'c\ 'VcY'L g'f'c\	xc[dgb Vi 'tdc 'VcY >ZVh	xc[ZgZcXZh	

$$\mathcal{R}^1 * [X^* * ()]$$

## 2.16

B VgēZ Vgk] VZdađ ħih] VkZ [dj cY'b j X] d[i] Zī ddYZc'] j aīd[ V'hmZZci] "XZcij grh] ē'ē V' ddYZY'f j Vgg'ē'hdj i] ZVhi  
: cā/cY#L ] Zc'f'h'ZnedhZY'īd V'gVcYī ViZgī ddY'gđih'f j 'X an] cāzh'h'f'h'egđiXīZY V'h'hZY'b Zci'ī Vi'h] Zā'h'f'[gđb  
dm\\Zc# ] ZgZ[dgZ'ī] ZY'hXdkZgZY'h] ē1 V'h'a' ZanTTTTT

L ] X] X] dXZ'b dhi ad\XVanXdb eaZiZh'i] ZiZm4

6#XdkZgZY`WnV°egdiZXi kZ`hZY`b Zci`a/nZg`c`i] Z`fj Vgg#

7#dcZ`d[`hZkZgVadi] Zgh] ^eh`Wj gZY`^c`i] Z`hVb Z`fj Vggn#

8#V'Xdc gb Vi'dc'd[eg'k'dj h'i] ZdgZh'W'dj i'i] Z'ineZ'd[ 'i ddY'i] Vi' V'hj hZY'c'h'mZZci] "XZcij g'h] 'eh#

9# ghi Xdchig XiZY`b j X] `ZVgaZgi] Vc`egZk`dj han`i] dj \] i#

9/1 \* [X \* () °6chl Zg

8dggZXi °6chl Zg/6

GV i ^dcVaZ

8] d'XZ'6'h'i] Z'VZhi'Vchl ZgVZXVj hZ'↑b dhi'ad\XVaan\Xdb eZiZhi] Z'iZmi'hY'hXj hh'ld'c'd[i] ZY'hXdkZgZY'h] e#i ] Z'iZmi'hiViZh  
i] Vi'b j X] 'd[i] Z'h] 'eh'1 ddYZc'j j aai Vh'[dj cY'c'V'fj Vgg#i ] Z'iZmi'Vahd'hiViZh'i] Vi'1 ddY'gdi'h'fj 'X' anj caZhh'↑'h'egdiZXiZY  
Vh'hZY'b Zci!! ] 'X] 'h] 'Za'h'i] Z'i ddY'[gib 'Znedhj gZ'id'dnm\Zc#i'h'i] ZgZ[dgZ'gVhdcVWZ'id'c[Zgi] Vi'i] Z'hj gk'k'c\ 'edg'ld'c'd[  
i] Z'h] 'eh'] j aai Vh'XdkZgZY'hVh'Vc'dnm\Zc'h] 'Za'c\ 'a/nZgd['hZY'b Zci#

8] d'XZ'7'h'cXdgZXi WZXVj hZ'cdi] e'\`e'i] ZiZni'hj \\\Zhi'h'di] Zgh] e'h] VhZ'WZzc'dgVgZ'a'Za'n'id'WZ'[dj cY'c'i] Z'hVb Z'fj Vgg#  
 l ] Z'[VXi'i] Vi'b j X] 'd[i] 'h'h] e'h'l ddY'hj gk'kZY'[dgXZcij gZh'c'i] Z'fj VggYdZh'gV'hZ'i] Z'edhh'Wan'i] Vi'i] ZgZ'b ^] i'WZ'di] Zg  
 egZhZgkZY'h] e'h!WY'i] ZiZni'egdkYZh'cd'hj eedg'[dgjh X] 'V'XdcXaj h'dc#8] d'XZ'8'h'cXdgZXi WZXVj hZ'i] ZiZni'YdZh'cdi  
 VYgZhh'i] Z'ineZ'd[1 ddY'j hZY'c'h'mZCci] "XZcij gn'h] e'h'dgVcn'i] ZdgZh'eZgV'c'e\`id'1 ddY'X] d'XZ'c'h] e'h#8] d'XZ'9'h  
 cXdgZXi WZXVj hZ'i] ZiZni'hiViZh'dcan'i] Vi'i] Z'h] e'h'[gdb'i] Z'h'mZCci] XZcij g'l' ^] 'cd'di] ZgYViZh'd[[ZgZ'Y'[dg'h  
 Xdchig Xi'dc!VcY'i] j h'i] ZgZ'h'cd'W'h'h'id'Xdch'YZgVajZgV'i'kZ'\Zh'[dgi] Z'h] e#6YY'f'dcVan'ZkZc'f'i] Z'h] e'1 Vh  
 Xdchig XiZY'ZVgZg'f'h'cdi'ad\XVan'XdccZXiZY'id'i] ZiZni'hY'hXj hh'dc'd['] dl' ^'1 Vh'egZhZgkZY#

Fj Zhi^dc°9^ Xj añ/B ZY↑ b

Fj Zhi ^dc>9°(Y\*%\*-.\*

6hhZhnb Zci	I Zhi	9db V'c	H' 'aa	9^ Xj an
H6l	GZW'c\ 'VcY'L g'f'c\	xc[dgb Vi 'tdc 'VcY >ZVh	xc[ZgZcXZh	

9/ (Y\*%\* - . \*

2.17

EVg] Zcd\ZcZh<sup>h</sup>h<sup>h</sup>V[dgb d[<sup>g</sup>egdYj Xi<sup>dc</sup>°c<sup>1</sup> ] X] V[Zb Vā<sup>g</sup>egdYj XZh<sup>1</sup> 1) dj i<sup>b</sup> Vi<sup>c</sup>\#H] Z<sup>eg</sup>dYj XZh<sup>Vc</sup>Z\XdcV<sup>c</sup>\V  
h<sup>c</sup>\ā<sup>d</sup>[[heg<sup>c</sup>\ ] dhZ<sup>9</sup>C6!dg\ZcZi X<sup>b</sup> ViZgVā<sup>Xdb</sup> Zh<sup>Zci</sup> <sup>g</sup>Zā<sup>g</sup>lgb 1<sup>h</sup>b di] Zg<sup>#</sup>6b dc\W<sup>y</sup>h<sup>e</sup>Vg] Zcd\ZcZh<sup>h</sup>] Vh<sup>V</sup>WZc  
[dj cY<sup>c</sup>\V] VcYlj ād[<sup>h</sup>eZX<sup>Zh</sup>!°cX<sup>g</sup> Y<sup>c</sup>\e\Zdch<sup>VcY</sup>ij g Znh<sup>#</sup>L ] Zc<sup>h</sup>X<sup>Zci</sup> h<sup>ih</sup>Vi<sup>i</sup>] Z<sup>H</sup>Vc<sup>9</sup>Z<sup>d</sup>\Odd<sup>Vc</sup>Vā<sup>o</sup>ZY<sup>i</sup>] Z<sup>9</sup>C6<sup>d</sup>[i] Z  
oddh<sup>8</sup>Vā<sup>dgc</sup>V<sup>Xdc</sup>Ydg<sup>h</sup>V<sup>h</sup>eZX<sup>Zh</sup>d[kj āj g<sup>Z</sup>h<sup>i</sup>] ZnY<sup>h</sup>XdkZ<sup>g</sup>Y<sup>i</sup>] Vi<sup>il</sup> d<sup>c</sup>Y<sup>k</sup>Yj Vā<sup>h</sup>1 Zg<sup>Z</sup>c<sup>i</sup>\ZcZi X<sup>Vā</sup>h<sup>b</sup> ā<sup>g</sup>Zcdj \] i<sup>d</sup>Vcn  
d[i] Z<sup>b</sup> Vā<sup>h</sup>°c<sup>i</sup>] Z<sup>Xdc</sup>YdgZcXā<sup>h</sup>j g<sup>Z</sup>i<sup>d</sup>W<sup>i</sup>] Z<sup>g</sup>d[[heg<sup>c</sup>\#=# dl ZkZg<sup>W</sup>di] ] VY<sup>i</sup> ViX] ZY<sup>i</sup>[<sup>g</sup>lb Z\h<sup>a</sup>\Y<sup>W</sup>h[Zb Vā<sup>h</sup>°c<sup>i</sup>] Z  
ZcXā<sup>h</sup>j g<sup>Z</sup># ] j h<sup>i</sup>] Z<sup>h</sup>X<sup>Zci</sup> h<sup>ih</sup>XdcX<sup>g</sup> YZY<sup>i</sup>] Vi<sup>TTTTT</sup>

L ] X] X] dXZ`b dhi`a\XVan`Xdb eaZiZh'i] ZiZm4

6#Vi'ǎVhi'dcZ'd[i] dhZ'cYk'Yj Vah'b di] Zgh'i Vh'Vdgc'Vh'V'gZhj a'd[e'Vgj Zcd\ZcZh'h#

7#8VafdcV^XdcYdghbVn°ZeqYjXZ[i]qj\ \°eVg]Zcd\ZcZhñ°c°oddhW|i°cdi°c°i]ZiA#

8#] Z'b di] Zgh'd[i] Z'il d'cYk'Y Vh'egdWVh'gZegdY XZY'i] g]j \] 'eVg] Zcd\ZcZh'h#

9#8Va[dgc\^XdcYdgn^ZegdYj XZi'] gdl \ ] eVg] Zcd\ZcZh^ndcan^f'[Zb VaZh^a/X`hj XZci VXXZh^id^b VaZh#

9/(Y\*% -. \* °6ch Zg

8dgg7Xi°6chl Zg/8

GVl ^dcVaZ

8] d\XZ`8`h[i] Z\WZhi Vchl ZgWZXVj hZ`↑b dhi`ad\XVanXdb eZiZhi[i] ZiZni hYhXj hh`dc`d[eVg] Zcd\ZcZh`hVh`↑gZa\Zh`id`il d  
8Va[dgc`V`XdcYdgh`Vi`i] Z`Hvc`9`Z`d`Odd# [ ] ZiZni Znea`/ch`i] Vi`eVg] Zcd\ZcZh`h`hV`[dgb`d[`gZedYj Xi`dc`c`l [ ] X] V`[Zb VaZ  
gZedYj XZh1` ↑] dj i`b Vi`c`!`egdYj Xc`Vc`Z`X`XdcV`c`Vc`d[[hegc`V` ↑] `9C6[i] Vi`Xdb Zh`Zci`gZan`[g]b`↑h`b`di] Zg#6[i] Zg  
cdi`c`ZnVb eZh`d[eVg] Zcd\ZcZh`hVb dc\Wgh`i[i] ZiZni[i] Zc`gZedgh`dc`VY`hXdkZgn`Vi`i] Z`Hvc`9`Z`d`Odd#6XXdgY`c`↑d  
i] ZiZni`hXZci`hi`hVi`i] Z`odd`[dj cY`i] Vi`il d`d[i] Z`oddh`8Va[dgc`V`XdcYdgh`l ZgZci`h`b`VgZcdj`V`↑d Vcn`d[i] Z`oddh`b VaZ  
XdcYdgh`id`WZ`i] Z`gd[[hegc`V`#<`kZc`i] Vi`eVg] Zcd\ZcZh`h`dXXj gh`l ↑] dj i`b Vi`c`VcY`gZhj`ah`c`Vc`d[[hegc`V` ↑] `9C6  
Zci`gZan`[g]b`↑h`b`di] Zg↑Xvc`gZhdcWVh`WZ`c[ZgZ`Y`i] Vi`i] Z`hXZci`hi`hXdcXj YZ`Y`i] Vi`i] Z`b`di] Zgh`d[i] Zi`il d`XdcYdgh  
egdWVh`hY`Yci`b ViZ1` ↑] Vcn`d[i] Z`b VaZ`XdcYdgh`Vi`i] Z`odd!`gZedYj Xc`V`i] [g]b`V`eVg] Zcd\ZcZh`h`chi`ZVY`#

8] d\XZ`6`h`cXdgZXi VZXVj hZi] ZiZni`cZkZghj \Zhihi] Vi Vi`aVhi`dcZ`d[i] Z`XdcYdgh`b di] Zgh` VhVdgc`VhV`gZhj`a`d[  
eVg] Zcd\ZcZh`h#GVi] Zgi] ZiZni`hj \Zhihi] Vi i] Zi i d`XdcYdgh`i Zg`i] Zb hZkZh`Wdi] `egdVWVhVdgc`VhV`gZhj`a`d[  
eVg] Zcd\ZcZh`h`i ] X] i dj a`VXXdj ci`dgi] Z`ga`X`d`hi gdc\`ZcZi`X`gZhZb`W`cXZ`id`Vcn`d[i] Z`b Vā`XdcYdgh`c`i] Z`oddh`  
XdcYdgZcXadhj`g`#8] d\XZ`7`h`cXdgZXi VZXVj hZi] ZiZni`cZkZgY`hXj hhZh`i` a`8Va[dgc`V`XdcYdgh`!dca`8Va[dgc`V`XdcYdgh`  
ak`c\`Vi i] Z`Hvc`9`Z`d`Odd#; dgi] h`gZVhdc[i] ZiZni`YdZh`c`i`hj eedg`V`XdcXaj`h`dc`i] Vi Y`hi`c\`j`h] Zh`WZi` ZZc`] dl` 8Va[dgc`V`  
XdcYdgh`g`egdiY` XZ`c`oddh`VcY`] dl` i] Zn`g`egdiY` XZ`c`i] Z`i` a`#8] d\XZ`9`h`cXdgZXi VZXVj hZi] ZiZni`cZkZghj \Zhihi] Vi  
i] Z`oddh`[Zb Vā`XdcYdgh`a`X`ZY`hj` X`Zci`VXXZh`h`id`b Vā`h`dgi] Vi i] h`i dj a`VZ`V`XVj hZ`d[eVg] Zcd\ZcZh`h`c`Y`XVi`c\`dca`  
i] Vi i] Z`XdcYdgZcXadhj`g`c`Xaj`YZY`b Vā`h`#

Fj Zhi ^dc°9^ Xj an/B ZY↑ b