

'('bYiY'@UbXk]fhY'ZØf'X]Y'CVYfdZU`n. :Y]Yf`]WXY:fY]gdfYWXib[']b'BYighUXh

6Y] XYf ZY]Yf`]W\Yb: fY]gdfYW\i b[']b'BYi ghUXh'k i fXYb'' (
5Vgc`j YbhYb'U`g'ghUUh`]W\'UbYf_UbbhY'@UbXk]fhY'[YY\fh"8]Y
bYi Yb'9I dYfhYb']b'XYf'@UbXk]fhgW\UZh'nY][Yb'[fc» Yg
9b[U[Ya Ybh'ZØf'Y]bY'ni _i bZhgZÀ\][Y'@UbXk]fhgW\UZh"

K Y]XYb#BYi ghUXh#H]fgWXYbfYi h\"=b XYf b OfX`]WXYb CVYfd ZU`n ZUbX __Øfn`]WX Y]bY VYY]bXfi W_YbXY : Y]Yf ni f : fY]gdfYWXi b['j cb'' ('Zf]gWX YI Ua]b]YfhYb @UbXk]fhYb ghUhh" 8]YgY 5Vgc`j YbhYb \UVYb']\fY XfY]^A\f][Y 5i gV]`Xi b['YfZc`[fY]WX Ub XYb 'Ya hYfb ZØf 9fbA\fi b[ž @UbXk]fhgWX UZh i bX : cfghYb UV[YgWX `cggYb i bX XØfZYb g]WX 'bi b 'ghUUh`]WX UbYf_UbbhY @UbXk]fhY 'bYbbYb"

8]Y'6YXYi hi b['XYf'5i gV]`Xi b['ZØf'X]Y FY[]cb

8]Y'ZY]Yf`]W\Y'J YfUbghU`hi b[']b'XYf'GhUXh\U``Y'BYi ghUXh'k Uf'b]W\h bi f'Y]bY'9\fi b['XYf'bYi Yb'@UbXk]fhYž'gcbXYfb'Ui W\'Y]b VYXYi hgUa Yf'A ca Ybh'ZØf'X]Y'[YgUa hY'FY[]cb"'8]Y @UbXk]fhgW\UZh'gd]Y`h'Y]bY'nYbhfU`Y'Fc``Y']b'XYf'bÒfX`]W\Yb CVYfdZU`nž'i bX'X]Y'[i h'Ui g[YV]`XYhYb': UW_fÀZhY'g]bX YbhgW\Y]XYbX'ZØf'X]Y'G]W\YfghY``i b['bUW\\U`h][Yf'5[fUfdfU_h]_Yb i bX'X]Y': ÒfXYfi b['XYf'`c_U`Yb'K]fhgW\UZh"'8]Y'5Vgc`j YbhYb\UVYb'b]W\h'bi f'XUg'bÒh][Y'K]ggYb'ØVYf'a cXYfbY'HYW\b]_Ybž gcbXYfb'Ui W\'ØVYf'I a k Y`h!'i bX'?`]a UgW\i hnž'X]Y']b'XYf'\Yi h][Yb 5[fUfk]fhgW\UZh'i bYf`Àgg`]W\'g]bX"

< YfUi gZcfXYfi b[Yb]b XYfa cXYfbYb

@UbXk]fhgWXUZh

£\UbbYg'<YVUi Yfž'6YfY]W\g`Y]hYf' 9fb\A\fi b['i bX @UbXk]fhgW\UZh 'Ub'XYf'FY[]Yfi b['ž'VYhcbhY']b'gY]bYf'5bgdfUW\Yž XUgg'X]Y'5bZcfXYfi b['Yb'Ub'@UbXk]fhY'ghYh]['ghY]['Yb'' K]ggYb']b DfcXi _h]cbghYW\b]_'i bX'6Yhf]YVgk]fhgW\UZh'U``Y]b'fY]W\h'b]W\h a Y\f'Ui g ž'gc'<YVUi Yf''5i W\'?Ybbhb]ggY']b'?`]a UgW\i hn'i bX A]hUfVY]hYfZØ\fi b['g]bX'j cb'[fc\(\frac{1}{2}\)Yf'6YXYi hi b[''I a 'YfZc`[fY]W\ni 'gY]bž'a ØggYb'X]Y'bYi Yb'@UbXk]fhY'g]W\'_cbh]bi]Yf`]W\'Zcfh! i bX'k Y]hYfV]`XYbž'i a 'a]h'XYb'9bhk]\W_`i b[Yb']b'XYf'6fUbW\Y GW\\f]hh'ni '\U`hYb''

5 i g[YnY]WXbYhY 5 Vgc \ j YbhYb

- $x \in Ug^{-6}UmYf^{-6}mZ^{+} Z^{-6}VYhf]YV^{-1}DYhYf^{-1}Ghfi bn^{-1}b$ K U`XYfq\cZŁ
- A UI]a]`]Ub '6Àf'f%ž, (ž'@Y\fVYhf]YV'6]@UŁ
- 7\f]ghcd\"6Y]Yf\"f\\\\\\\, (\z'@Y\f\\Yhf]Y\"6]@UŁ
- $x \in \mathbb{Z}^2$ $x \in \mathbb{Z}^2$
- A Uhh\] $Ug^9W_`f\%Z$ ($\check{z}'@Y \setminus fVYhf]YV^6]@UŁ$

5 i gV`]W_ Ui Z'X]Y Ni _i bZh'XYf 5 Vgc`j YbhYb

K c`Z[Ub['K Yb]gW\ž'6Y\ÒfXYb`Y]hYf'Ua '5a h'ZØf'9fbÀ\fi b[ž @UbXk]fhgW\UZh'i bX': cfghYb'H]fgW\YbfYi h\!K Y]XYbž'Yfa i h][hY'X]Y 5Vgc`j YbhYbž'g]W\'Xi fW\'K Y]hYfV]`Xi b['Ub'XYf @UbXk]fhgW\UZhggW\i `Y'K Y]XYb'Ui Z'X]Y'<YfUi gZcfXYfi b[Yb'U`g 6Yhf]YVg`Y]hYf'j cfni VYfY]hYb"'8Ua]h'_ÒbbYb'g]Y'b]W\h'bi f']\fY Y][YbYb'6Yhf]YVY'YfZc`[fY]W\'ZØ\fYbž'gcbXYfb'Ui W\'ni f'GhÀf_i b[XYf'fY[]cbU`Yb'5[fUfk]fhgW\UZh'VY]hfU[Yb"

±g[YgUa h'k i fXY'k À\fYbX'XYf'NYfYa cb]Y'XYi h`]W\ž'XUgg'X]Y
5i gV]`Xi b['b]W\h'bi f'ZØf'X]Y'VYfi Z`]W\Y'Ni _i bZh'XYf'5Vgc`j YbhYb
j cb'6YXYi hi b[']ghž'gcbXYfb'Ui W\'ZØf'X]Y'bUW\\U`h][Y
9bhk]W_`i b['XYf'@UbXk]fhgW\UZh']b'XYf'bÒfX`]W\Yb'CVYfdZU`n"
8]YgY'[i h'Ui g[YV]`XYhYb'@UbXk]fhY'_ObbYb'_ØbZh]['YbhgW\Y]XYbX
XUni 'VY]hfU[Ybž'X]Y'<YfUi gZcfXYfi b[Yb'XYf'₺Xi ghf]Y'ni
a Y]ghYfb'i bX'Y]bYb'j YfUbhk cfhi b[gj c``Yb'I a [Ub['a]h
bUhØf`]W\Yb'FYggci fW'b'ni 'ZÒfXYfb"

B 5;

8 Y hU]`q

6 Ygi WX Yb 'G]Y 'i bg 'Ui Z 'b!U["XY