① 1 0 0 1 1 1 0 0 0 0

1 1 0 0 1 1 0 0 0 0 → 2

0 0 1 1 0 0 1 1 0 0

② 2 4 5 3 1

③ 

$2x+2 = 2y+6 \rightarrow x = y+2$ $\quad x \neq 2,\ y \neq 1$

~~→ x = 3 et y = 0~~ → $x = 4,\ y = 2$

~~20:03:34|40:01:24~~

20:04:43|32:21:14

④ 12 j où il a plu le matin ou l'AM.

diff = 6 ~~BIAS~~

→ 9 matins ~~20~~ avec pluie + 14 sans
+1
3 ap-m avec pluie + 20 sans
+1
→ 10

⑤

		6			
	0	3	1	2	
3	3	1	2	0	
	2	0	3	1	4
	1	2	0	3	
		5			

6 = 1+2+3

5 = 2+3

4 = 1+3

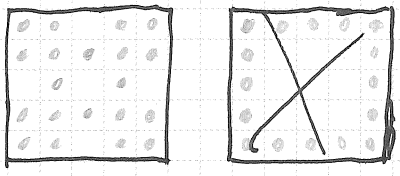
⑥ 20+14+10 → 40+4+0 → 39+3+2 → 38+2+4

37+4+3 → ~~38~~ diff mod 3 préservée. → 0+0+44

20+14+10 —2→ 18+18+8 —18→ 0+0+44

2+18 = 20

⑦



20

⑧ 2014 → 2104 → 2203 → 2200 → 2110 → 2101 → 1111

2014 → 3013 → 0013 → 1003 → 1012 → 1102 → 1111

2014 → 3013 → 3211 → 0211 → 1201 → 1111

5 ?

⑨ 1 . . . . .

nb impair → chiffre des unités supprimé

1abcde + 1abcd → a=8 → b=3 → c=0 → d=9

1abcd

1830?4 ←

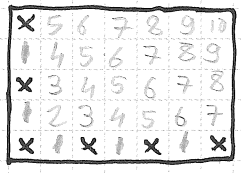
1830?

201403

• Si d+e=3, c+d=0 ou 10

- Si c=d=0, e=3, b=4, a=7 imp.

⑩



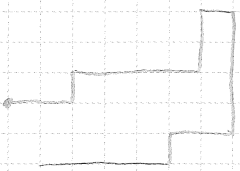
6?

(11) H: 2 ±4 ±1 ±2 ±4 ±1

V: 1 ±2 ±4 ±1 ±2

H: 2+4+1-2-4-1

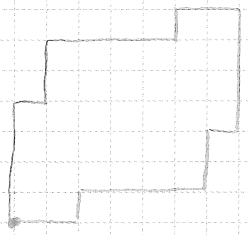
V: 1+2-4-1+2



→ non #H=#V?

H: 2 4 1 2 4 1

V: 1 2 4 1 2 4



7×4=28

(12) ~~5 conv: 12 12 12,34 34,56 56~~

5 conv: 1 connaît tout. ~~1 6 aussi~~

et 6 aussi → +4 conv. → 9?

12 12 3 4 5 6

123 12 123 4 5 6

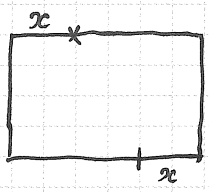
1234 12 123 1234 5 6

12345 12 123 1234 12345 6

(13)

$L = \frac{3}{2} l$

$S = \frac{\pi}{4}\left(l^2 + (L+l)^2 \times 3 + L^2\right) = 88\ m^2$



$\rightarrow S' = \frac{\pi}{4}\left(x^2 + (l+x)^2 + (L+l)^2 \times 2 + (L+l-x)^2 + (L-x)^2\right)$

$4x^2 + 2(2l - L - l - L)x + \left(l^2 + 2(L+l)^2 + (L+l)^2 + L^2\right)$ #

$\rightarrow$ minimiser

$4x^2$ # $- 4Lx = 4x(x-L) \rightarrow x = \frac{L}{2}$

$4\frac{L}{2} \times \left(-\frac{L}{2}\right) = -L^2$ [mieux que $-l^2$ si on échange L et l]

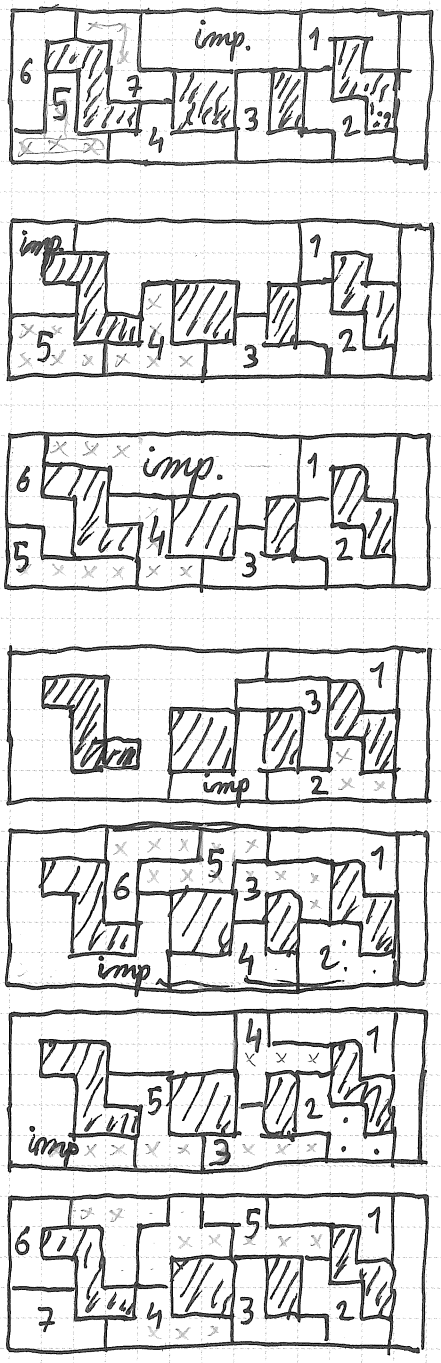
$S = \frac{\pi}{4} \times \left(\frac{4}{9} + \frac{25}{9} \times 3 + 1\right) L^2$

$= \frac{\pi}{4} \times \frac{4+75+9}{9} L^2 = \frac{\pi}{36} \times 88 L^2$

$S' = S - \frac{\pi}{4} L^2 = \frac{\pi}{36} \times (88 - 9) L^2$

$S'/S = 79/88 \rightarrow S' = 79\ m^2$

(15)



seules possibilités avec ce 1

(18) $x > y > z$

$x + y + z = k^2$

$x^2 + y^2 + z^2 = 2014$

4 2 4

1 4 9 16 25 36 49 64 81 100 121 144 169 196 225 256 289

324 361 400 441 484 529 576 625

$44^2 = 1936$

$x = 44$? non

$2014 - 1936 = 78$

$43^2 = 1936 - 87 = 1849$ non

$2014 - 1849 = 165$

$42^2 = 1764$

$2014 - 1764 = 250$

(42, 15, 5) non

(42, 13, 9) oui

$a^2 + b^2 \not\equiv 3 \ [4]$

$41^2 = 1681$

$2014 - 1681 = 333$

(41, 18, 3) non

$40^2 = 1600$

$2014 - 1600 = 414$

$39^2 = 1521$

$2014 - 1521 = 493$

(39, 22, 3) oui

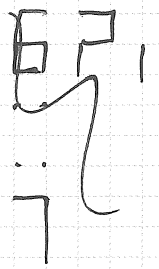
(39, 18, 13) non

$38^2 = 1444$

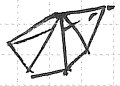
$2014 - 1444 = 570$

$37^2 = 1369$

$2014 - 1369 = 645$

(14) 

(16) Cube: $90 \times 12 = 1080$



$180 \times 10 = 1800$

90

2014 / 270