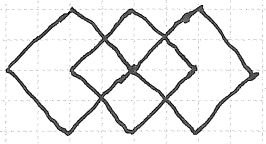
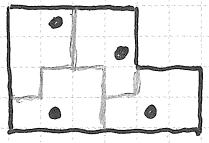
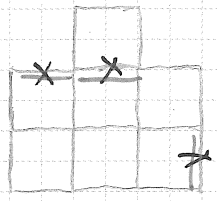
① $1+23+4+5+67 = 100$

②  → 7

③  5×4

④ 

⑤

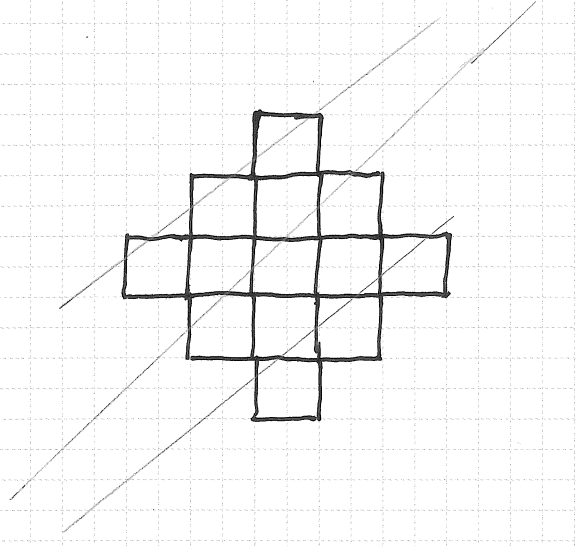
	12	6	
9	1	2	10
7	4	3	8
	5	11	

→ 2+9

↓ 2+3

⑥ $4T + R = 8$
$6T + 3R = 15$
$8T + 6R = 4\times3 + 6\times2 = \underline{24}$

→ $6T = 24 - 15 = 9$, → $2T = 3$, $R = 2$

⑦ 

⑧ En 13 pages → 6×

1? → non
2? → non
3? → non
4? → 15 à "49" non
5? → 16 à "59" non
6? → 17 à "69" non
7? → 18 à "79"
14 à "76", 19 à "89"
8? → 19 à "89"
14 à "85", 20 à "98"

→ 98

⑨ PPCM(6,7,8,9) = $2^3 \times 3^2 \times 7 = 72 \times 7 = 504$

504, 1008, 1512 → 3 solutions

⑩

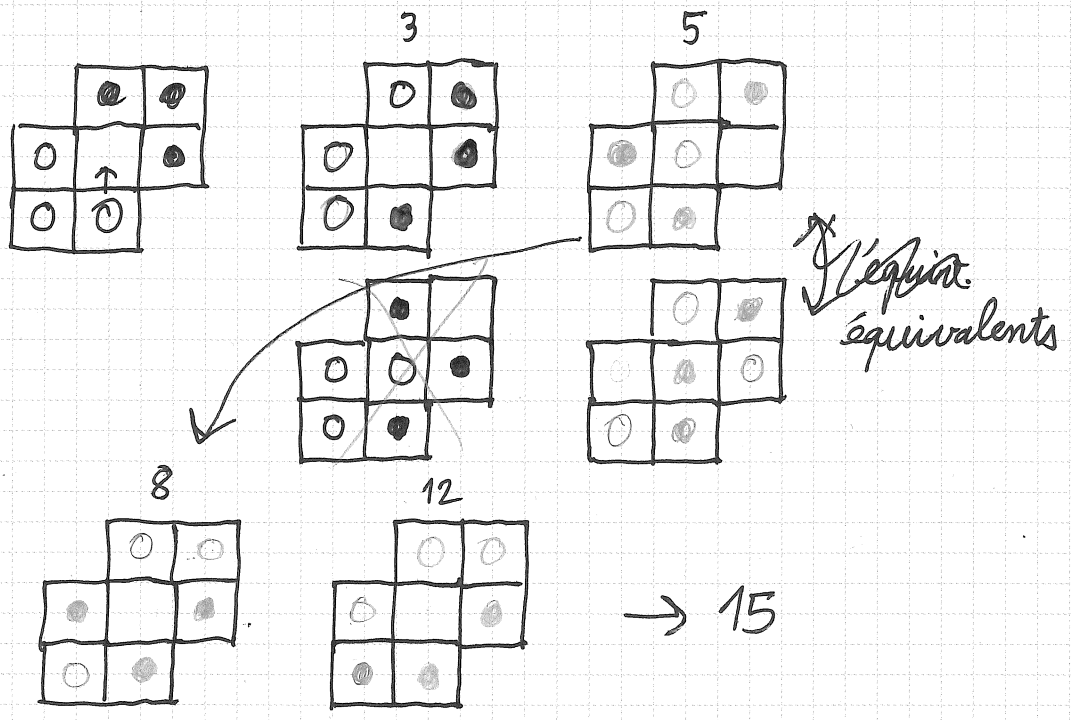
1 x 12
2 x 6
3 x 4
4 x 3
6 x 2
12 x 1

→ 6 solutions

e.g. $1200 + \frac{10 \times 10}{2} = 1250$

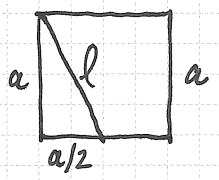
$1200 + 20 \times 20/2 = 1400$

⑪

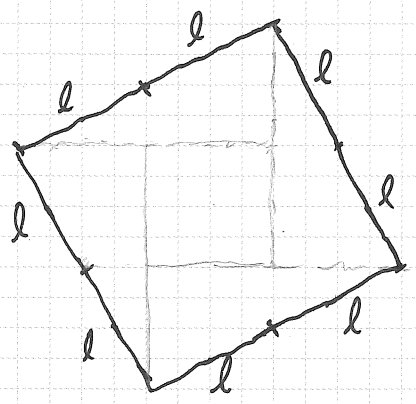


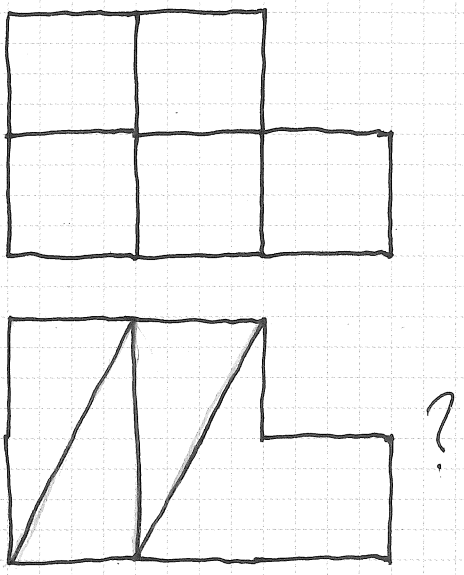
→ 15

(12) $a \to 5a^2 \to$ côté gd carré $= a\sqrt{5} = 2l$



$l^2 = \left(1+\frac{1}{4}\right)a^2 = \frac{5a^2}{4} \to l = \frac{a\sqrt{5}}{2}$

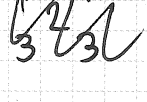




?

(13) 1 2 3 / 1 2 3 / 1 2 3

~~2~~ 1 2 3 / 2 1 3 / 2 3 1 (2 ech.) (2 ech)

↳ 

2 1 3 / 3 2 1 / 1 3 2 ↔ → 3 ech.

(15) a b c $\quad b = a+c$ [11]

$b = a+c$ ou $a+c = b+11$

550 et 803

$\overline{(10u+v)} \times 11 = 100u + 10(u+v) + v$

- Si $u+v \leq 9$: $10u+v = u^2 + (u+v)^2 + v^2$

$2u^2 + 2uv + 2v^2 = 10u + v \to 2 \mid v$

$v=0 \to u=5 \to 550$

$v=2 \to u^2+2u+4 = 5u+1$ i.e. $u^2-3u+3=0$ imp.

$v=4 \to u^2+4u+16 = 5u+2$ $u^2-u+14=0$ imp.

- Si $u+v \geq 10$: $10u+v = (u+1)^2 + (u+v-10)^2 + v^2$

$2u^2+2uv+2v^2-28u-21v+101=0 \to v$ impair

$v=9 \to u^2-5u+81-44=0$ imp.

$v=7 \to u^2-7u+49 \overset{37}{-} 23 = 0$ imp.

$v=5 \to u^2-9u+25 \overset{23}{-} 2 = 0$ imp.

$v=3 \to u^2-11u+28=0$

$u = (11 \pm 3)/2$

$\to u=7$

$v=1, u=9$ imp.

(14) $a_1 = 20$

$a_2 = 14$

$a_3 = \frac{15}{20} = 3/4$

$a_4 = \frac{3/4 + 1}{14} = \frac{7}{4 \times 14} = \frac{1}{8}$

$a_5 = \frac{9/8}{3/4} = \frac{3}{2}$

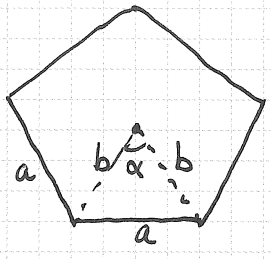
$a_6 = \frac{5/2}{1/8} = 20$

$a_7 = \frac{21}{3/2} = 14$

$\rightarrow$ période 5

$a_{2014} = a_4 = \frac{1}{8}$

(17)



$$L = \frac{1}{2}\sqrt{a^2 - b^2}$$

$\alpha = \frac{2\pi}{5}$ $\qquad \frac{a}{2} = b \cdot \cos(\pi/5)$

$$L = \frac{1}{2}\sqrt{4b^2\cos^2(\pi/5) - b^2}$$

$$= \frac{b}{2}\sqrt{4\cos^2(\pi/5) - 1}$$

$c = \cos(\pi/10)$

$\cos(2x) = \cos^2 x - \sin^2 x = 2\cos^2 x - 1$

$L = \frac{b}{2}$ $\qquad \cos(2x) = 2\cos^2 x - 1$ $\qquad L = \frac{b}{2}\sqrt{16c^4 - 16c + 3}$

$$\frac{a}{2} = b \cdot \left(2 \times \left(\frac{19}{20}\right)^2 - 1\right)$$

$$b = \frac{19/2}{2 \times 19^2/20^2 - 1} =$$

$b \simeq \frac{19}{2}$ $\qquad L \simeq \frac{b}{2}\sqrt{3}$ $\qquad 5 \times 1{,}7 \simeq 8{,}5$ $\qquad b = 8?$