① $a \geq 2$ $a = 2$? $b = 3$ $ab = 6$

$5 - 4$ 2×3

1 6

7

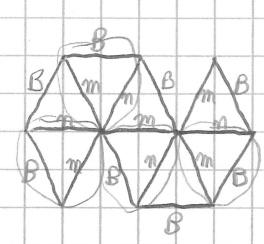
② $D = 1$

• $C = 9$? $1111 - 999 = 112$

$B = 4 \rightarrow$ $112 - 88 = 24 = 3 \times 8$ $A = 8$

$8 + 8 + 8 + 44 + 44 + 999 = 1111$

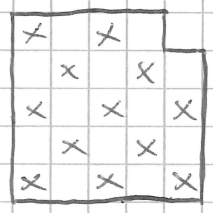
③



$8B$, $5m$, $4n$

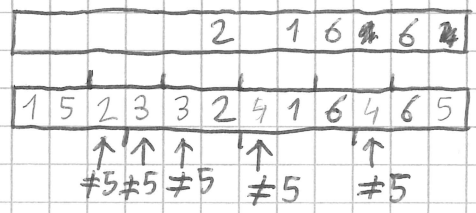
$\rightarrow 5$

④



T

⑤

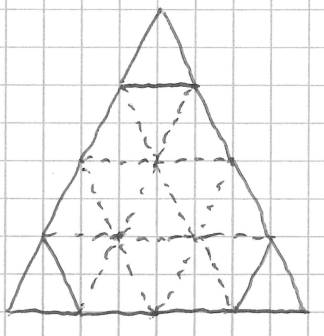


152

⑥ Côté petit trg : x Grd côté de l'hex : c

~~$x^2 \frac{\sqrt{3}}{4} = 77$~~

$3c + 3x = 9x \rightarrow c = 2x$



$13 \times 77 = 1001$

(7)

20 T x C

$\left.\begin{array}{l} TB + CB = TR + 16 \\ TB = TR + CR + 1 \end{array}\right\} - \rightarrow CB = 15 - CR$

$CB + CR = 15$

(8) $11 + 9 + 2 \rightarrow$ ~~10~~ $3 + 5 + 7$ non

~~11 + 9 + 8~~

$11 + 8 + 3 \rightarrow$ ~~5 4 7 4 10 etc~~

$5 + 7 + 1 + 9$ et $2 + 4 + 6 + 10$

Complément de 4 à 7 → 5 à 8 → 26

(9) C comp par wagon. Si $WR \geq 4$:

$39 = 3C + x$, $1 \leq x \leq C \rightarrow 10 \leq C \leq 12$

- Si $WR \geq 8$:

  $63 = 78C + \ldots$ imp

- Si $WR < 8$:

  $63 = 6\,4C + x$ ~~imp~~ $C = \underline{10}$

~~4)~~ Si $WR < 4$.

$39 = 2C + x$, $1 \leq x \leq C \rightarrow$ imp.

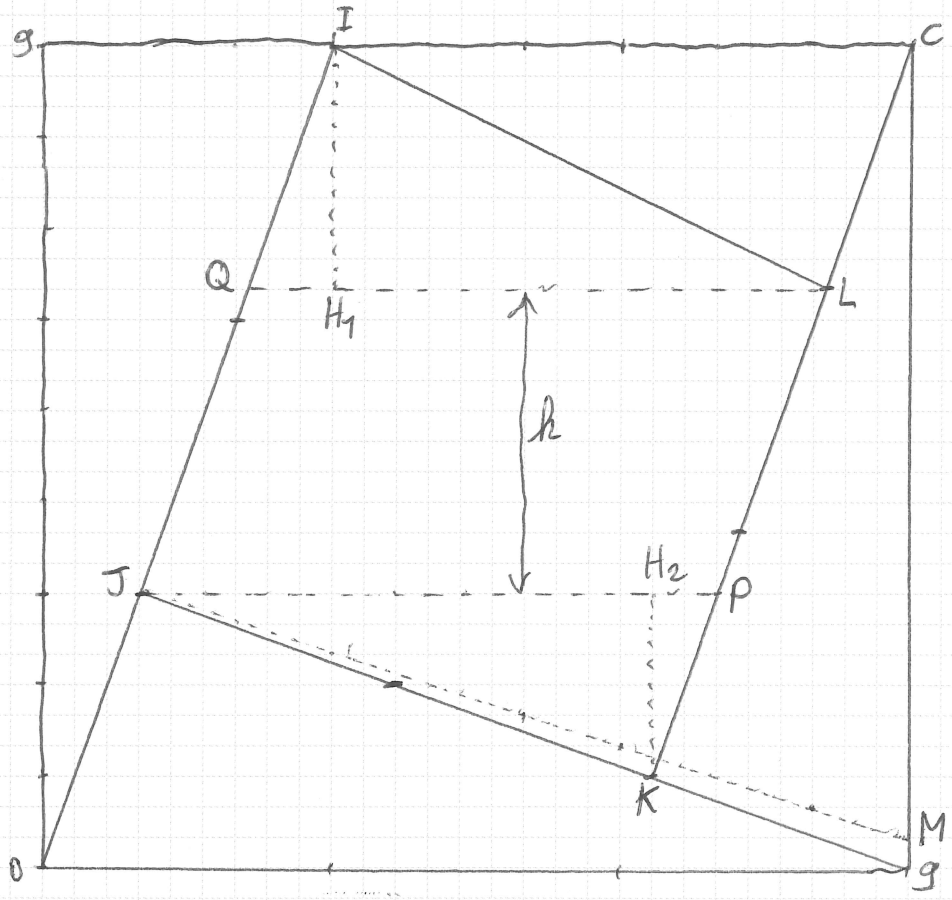
(10) 1re lampe : 3e interrupteur = B
2e " : EAA → 2e int = A
3e " : AEA → 4e int = A
4e " : AAE → 1er int = B
BABA

(12) 2 nb A et B
A + A = 54 A = 27
A + B = 66
B + B = 78 B = 39

$39k + 27(7-k) = 189 + 12k \quad 1 \leq k \leq 6$

Tiers : $63 + 4k$ ~~67~~ ~~71~~ 75 ~~79~~ ~~83~~ 87 2sol°

(13)



I : (3, 9)
J : (1, 3)
K : $(1+\frac{2}{3}8, 1)$
$= (6+\frac{1}{3}, 1)$
L : $(9-\frac{8}{9}, 9-\frac{8}{3})$
$\overrightarrow{JI}$: (2, 6)
$\overrightarrow{KC}$: $(\frac{8}{3}, 8)$
(IJ) // (CK)
M : (9, ~~1~~ 1/3)

P : (7, 3) Q : $(2+\frac{1}{9}, 6+\frac{1}{3})$ JP = 6 QL = 6

$IH_1 = 8/3 \quad KH_2 = 2 \quad h = 10/3$

$\text{Aire} = 6 \times \left(\frac{1}{2} \times \frac{8}{3} + \frac{10}{3} + \frac{1}{2} \times 2\right) = 6 \times \left(\frac{4}{3} + \frac{10}{3} + \frac{3}{3}\right)$
$= 6 \times \frac{17}{3} = 34$

(14) 1 2 3 4 ... 11

2 1 OK mais pas 3 1

k inv : $\binom{11-k}{k}$

0 inv : 1

1 inv : $10 = \binom{10}{1}$

2 inv : $8+7+6+\dots+1 = 36 = \binom{9}{2}$

3 inv : $\binom{8}{3} = \frac{8\times7\times6}{6} = 56$

4 inv : $\binom{7}{4} = \binom{7}{3} = \frac{7\times6\times5}{6} = 35$

5 inv : $\binom{6}{5} = \binom{6}{1} = 6$

$1+10+36+56+35+6 = 144$

(15) $T \leq 200$

$T \nmid AB, BC, CD, DE, EA$

$T \mid AC, AD, BD, BE, CE$

AC : facteur prem commun, etc.

Les facteurs prem sont $\neq$

2, 3, 5, 7, 11

$A = 2\times3$

$C = 2\times5$

$D = 3\times7$

$E = 5\times11$

$B = 7\times11$

$T \mid 2^2\times3^2\times5^2\times7^2\times11^2$

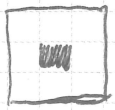
$\stackrel{?}{=}$ non

192 ?

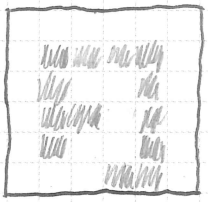
$192 = 2^6\times3$

$2\times3\times5\times7 = 210 > 200$

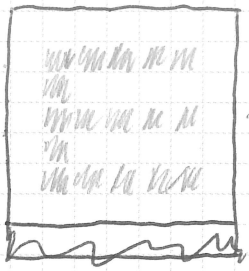
(16)



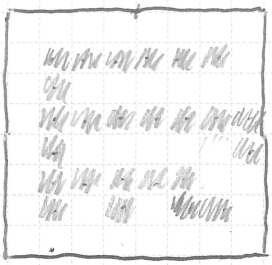
1, 5, 7

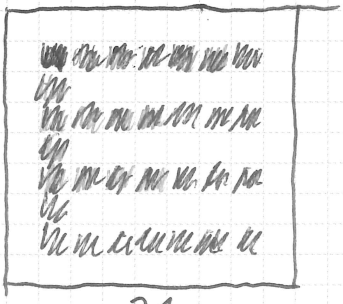


13



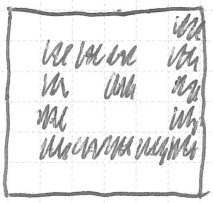
17

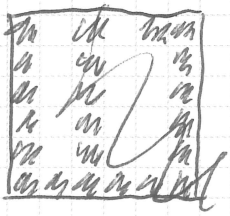


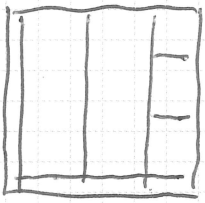


31

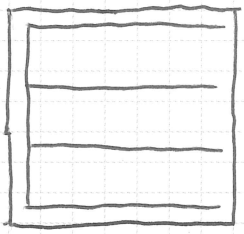
31







3 : 1 à 7
4 : 5 à 11
5 : 7 à 17
6 : 13 à 23
7 : 17 à 31
8 : 25 à 38
9 : 31 à 49



0	1	2	3	4
1	7	17	31	49
	6	10	14	18
		4	4	4

$f(n) - f(n-1) = 4n+2$

$$4 \times \frac{n(n-1)}{2} + 6n + 1 = 2n^2 + 4n + 1 = f(n)$$

3 : $f(0)$ à $f(1)$
5 : $f(1)$ à $f(2)$
7 : $f(2)$ à $f(3)$
⋮
63 : $f(30)$ à $f(31)$
1921 2047

$f(30) = 1800 + 120 + 1 = 1921$
$f(31) = 1921 + 126 = 2047$

2 sol° : 63 et 64

~~63 aussi~~
64 aussi
↳ ≃ 1980 à + de 2047

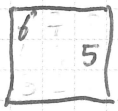
(18) $700 \times \frac{22}{15} = \frac{140 \times 22}{3} = \frac{3080}{3} \simeq 1027$

$\frac{22}{15} = 1,$

22	15
70	1,4666 $\simeq \sqrt{2}$
100	
100	

$700\sqrt{2} = \quad \simeq 1{,}414 \times 7 = 989{,}8$

990?

(11)  $1+2+\ldots+9 = 45 = 3 \times 15$