

①  $23 = 4 \times 5 + 3 \rightarrow \underline{\underline{43}}$

②

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

$6+8: 10 = 3+7$   
 $12+1: 11 = 4+7$

$\rightarrow 4 \text{ et } 9$

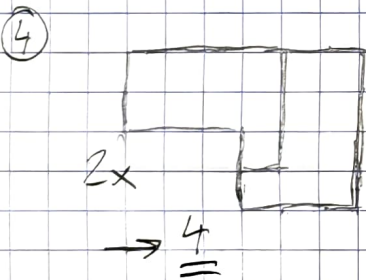
③  $2a + ab = b1$   
 $20 + 11a + b = 10b + 1$

$19 + 11a = 9b$

$9 \mid 1 + 2a$

$\rightarrow a = 4 \rightarrow \underline{\underline{47}}$

$(24 + 47 = 71)$



⑤  $2p + 4l = 24$   
 $p + 2l = 12$   
 $p = 2l \rightarrow 4l = 12$

$l = 3, p = 6 \rightarrow \underline{\underline{9}}$

⑥  $ab \quad a+b = 26$   
 $cd \quad a+c = 20$   
 $b+d = 24$   
 $c-d = 8$

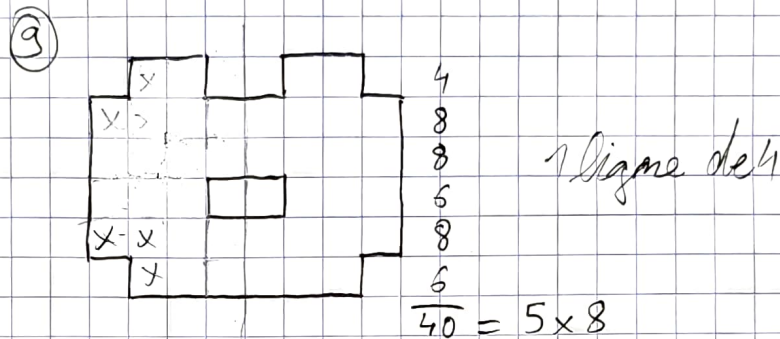
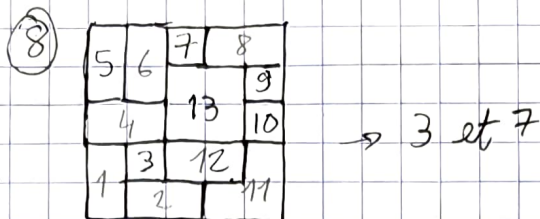
$S = 44 \rightarrow c+d = 18$

$\rightarrow c = 13$

7	19
13	5

⑦  $2(1+5+13) + 25$

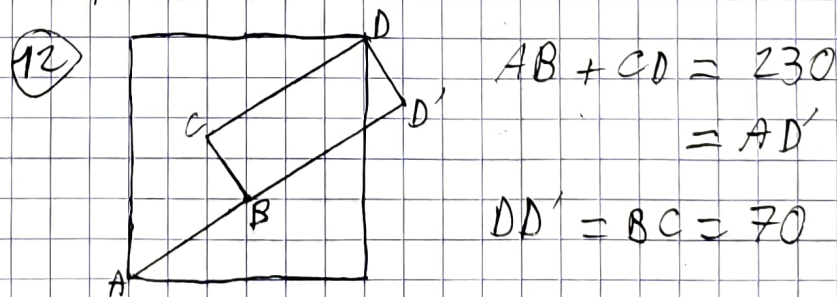
$= 38 + 25 = \underline{\underline{63}}$



⑩  $100E + C$   
 $5(100E + C) = 100C + 5E$   
 $100E + C = 20C + E$   
 $99E = 19C \quad C < 100$

$\rightarrow 19, 99$

- ⑪
- 1236 non (64)
  - 125x non
  - 2369 (233, 22) non
  - 2569 (31) non
  - 2589 non (11)
  - 4569 (453, 44) non
  - 4589 (455, 39) OK  $\rightarrow 1 \text{ sol}^\circ 4589$
  - 4789 non



$AD^2 = 230^2 + 70^2$

Aire =  $AD^2 / 2 = (23^2 + 7^2) \times 50$

$= (529 + 49) \times 50$

$= 578 \times 50 = \underline{\underline{28900}}$

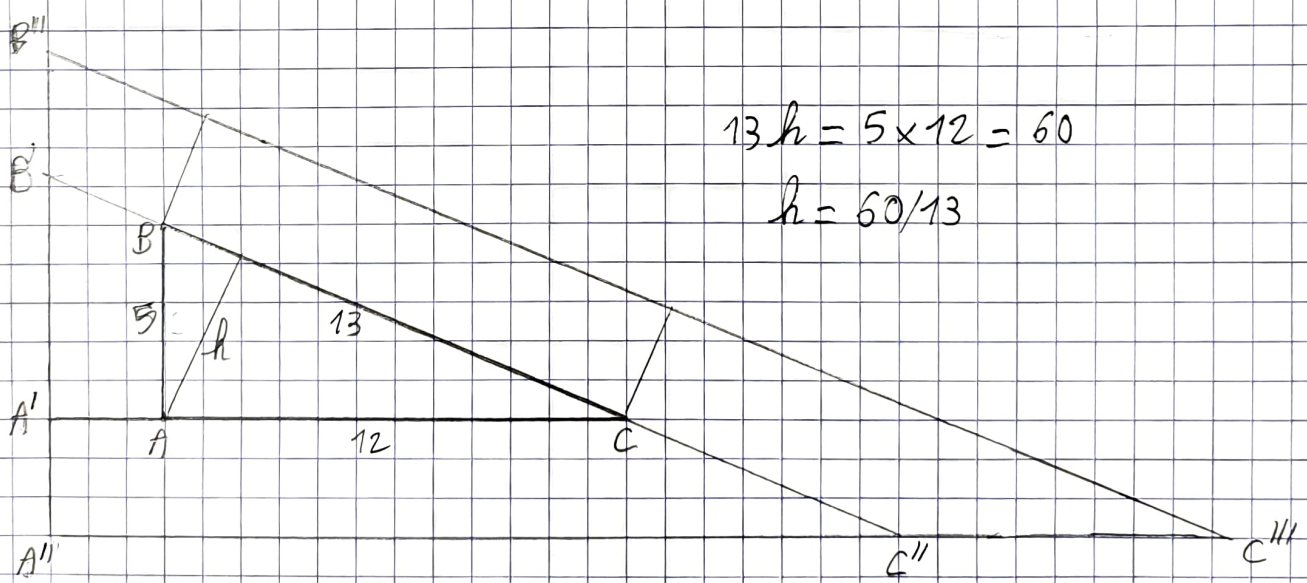
13) Centre: 0

$$1 + \begin{pmatrix} 11+12 \\ 3+14 \end{pmatrix} \quad 15 + \begin{pmatrix} 2+7 \\ 3+6 \\ 4+5 \end{pmatrix} \quad 8 + \begin{pmatrix} \cancel{2+14} (1) \\ 3+13 \\ 4+12 \\ 5+11 \\ \cancel{7+9} (1) \end{pmatrix} \quad 10 + \begin{pmatrix} 2+12 \\ 3+11 \\ \cancel{5+9} \text{ car } < \dots < \end{pmatrix}$$

- $1+11+12$  imposs ( $10+\dots$ )
- $1+3+14$
- $15+4+5 \Rightarrow 8+3+13$  et  $10+2+12$  (reste  $6+7+11$ )  
 $\rightarrow a=2$  et  $b=5$
- $15+3+6 \Rightarrow 10+2+12$  et  $8+5+11$  (reste  $4+7+13$ )  
 $\rightarrow a=2$  et  $b=6$
- $15+2+7 \Rightarrow 10+3+11$  et  $8+4+12$  (reste  $5+6+13$ )

2 sol<sup>o</sup>

14)



$$13h = 5 \times 12 = 60$$

$$h = 60/13$$

$a = \text{aire}(ABC)$

$$A'C = 15 \quad a' = \text{aire}(A'B'C) = \frac{15}{12} a = \frac{5}{4} a \quad a = 30$$

$$A'B' = \frac{5}{4} AB = \frac{25}{4} \quad \frac{A'B''}{A'B'} = \frac{25}{4} + 3 = \frac{37}{4}$$

$$a'' = \text{aire}(A''B''C'') = \left(\frac{37}{25}\right) a' = \left(\frac{37}{20}\right) a$$

$$h'' = \left(\frac{37}{20}\right) h = 3 \times \frac{37}{13} = \frac{111}{13} \quad h''' = h'' + 3 = \frac{150}{13}$$

$$a''' = \left(\frac{150}{3 \times 37}\right) a'' = \left(\frac{50}{37}\right) a'' = \left(\frac{5}{2}\right) a = \underline{\underline{75}}$$

16) 1 4 9 16 25 36 49 64 81 100 121 144 169 196 225 256  
~~289~~ ~~180~~ 289 324 361 400 441 484 529 576 625 676  
 729 784 841 900 961 1024 1089 1156 1225 1296  
 1369 1444 1521 1600 1681 1764 1849 1936 2025  
85 (89)

1936 + 88 non

1849 + ~~1764~~ ~~1764~~ 175  $25 \times 7$  non

~~1764~~ + ~~256~~

1764 + ~~289~~ 260  $13 \times 5 \times 4$   $260 = \overset{2x}{256} + 4 = \overset{1x}{196} + \overset{1x}{64}$

1681 + 343  $343 = 7 \times 7 \times 7$  non

1600 + 424  $424 = 8 \times 53$  OK  $= \overset{3x}{324} + \overset{2x}{100}$  seule poss.

→ 1600

1521 + 503  $4k+3$  non

1444 + 580  $580 = 4 \times 5 \times 29 = \overset{1x}{576} + 4 = \overset{3x}{324} + \overset{2x}{256}$

1369 + 655  $655 = 5 \times 131$   $4k+3$  non  $\uparrow \uparrow \rightarrow 2 \text{ decomp.}$

1296 + ~~728~~ ~~728~~  $728 = 8 \times 91 = 7 \times 13 \times 8$   $4k+3$  non

1225 + 799  $799 \neq 4k+3$

1156 + 868  $868 = 4 \times 217 = 4 \times 7 \times 71$   $4k+3$  non

1089 + 935  $935 = 5 \times 187 = 5 \times 11 \times 17$   $4k+3$  non

1024 + 1000  $1000 = \overset{2x}{900} + \overset{2x}{100} = \overset{3x}{676} + \overset{2x}{324}$

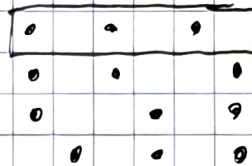
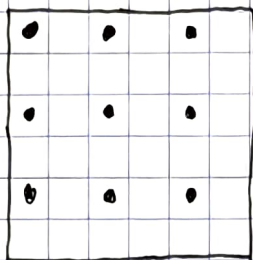
1600, 196, 64, 576, 676, 900 6 sol°

(18)

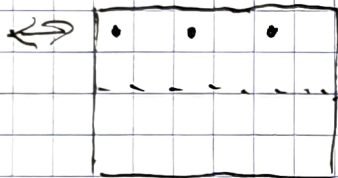
V: au moins 1 M comme voisin.

M: tous les voisins sont V.

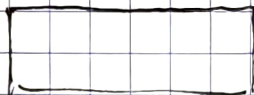
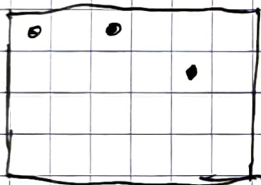
V	V	V	V	V
V	M	V	M	V
V	V	V	V	V
V	M	V	M	V



~~$4 \times 4 \times 4$~~   $4^4$  si rég.



$4 \times 32$



$4 \times 2^3 = 32$