① $5+5\times 2/2 = 10$

② 3 1 2 / 1 1 1 / 2 1 3

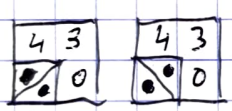
③ 4 4 3 2 / 4 3 3 4 / 3 3 1 — B: $11+9=20$; N: $10+4=14$

④ $932 \times 8 = 7456$

⑤ C T V / R D P → RC | DT | VP

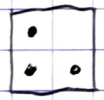
⑥ $a+40 = 3b$
$2a = 100 \rightarrow a = 50$
$\rightarrow b = 30$
$x = a+b = 80$

⑦ • Si carré noir :



→ 14 ou 16

• Sinon :



4 sol° sym. → 10
12 non sym. (ex double) $(4+\frac{12}{2})$

idem → 10

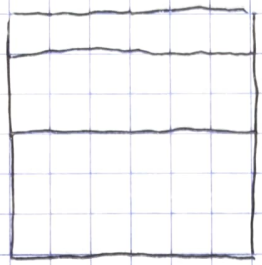
→ $4\times 4 = 16$

$14+10+10+16 = 50$

⑧ e.g. $1+1+3+1 \rightarrow 3$

~~⑧ $1+1+3+1 \rightarrow 3$~~

⑨



$6 = 1+2+3$
$6 = 1+5 = 2+4$

• 1, 2, 3, 5, 10, 15 → 1 sol°
• 2, 4, 6, 4, ... non

⑩

6 12 8 | Restent : 3 ou 4
3 6, 8, 12
11 15 impair ⇒ 3
2 1.
13

3 ou 4 → 4 5

⑭ $d \geq 5$

$9+10 \rightarrow$ 9 10 7

$1+14 = 3+12 = 5+10 = 6+9$

→ 12 et 14 (1 sol°)

⑪ $10a+b-1 = a^2+b^2$

$b^2 - b + (a^2 - 10a + 1) = 0$

$\Delta = 1 - 4a^2 + 40a + 4$
$= 4a(10-a) - 3$

36
64
84 → $\Delta = 81$ ($a = 3$ ou 7)
96
100

$a=3 \rightarrow b = \frac{1}{2}(1+9) = 5$

$a=7 \rightarrow b = \frac{1}{2}(1+9) = 5$

→ 34 et 74 (2 sol°)

(12) $h = c\sqrt{3}$ → Les dim. sont $\times \sqrt{3}$, donc aire $\times 3$.

$26 \times 27 = \underline{\underline{702}}$

(13) $7^5 - 7 = 7(7^4 - 1)$

$7^2 = 49 \quad 7^3 = 343 \quad 7^4 = 2401 \quad 7 \times 2400 = \underline{\underline{16800}}$

(14) $S = 1 + 2 + \ldots + 16 = 8 \times 17$

$s = S/4 = 2 \times 17 = 34$

Avec 1 et 2 : 15 et 16

(15) 1 feuille → $\frac{1}{2}$ aire

$$16\left(1 + 2\times\frac{1}{2} + 2\times\frac{1}{4} + 2\times\frac{1}{8} + \dots + 2\times\frac{1}{2^{16}}\right)$$

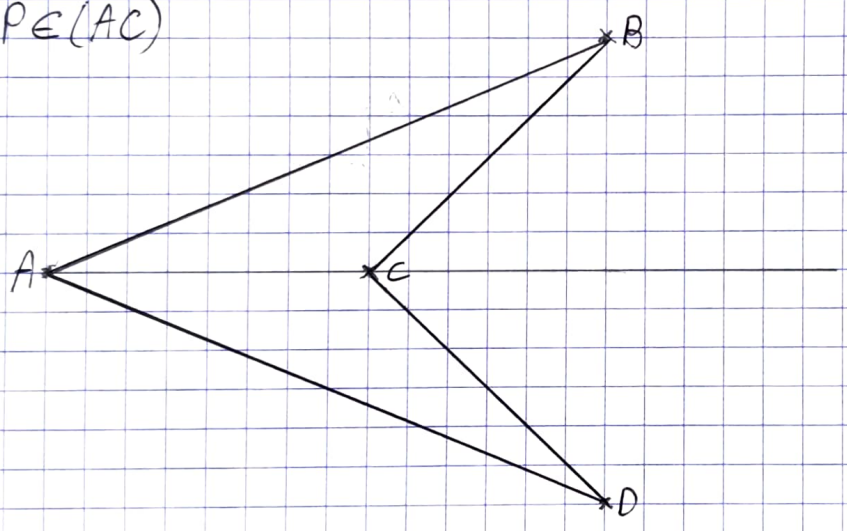
(0) (1) (2) (3)

$$\frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{2^{16}} = 1 - \frac{1}{2^{16}}$$

$$16\left(1 + 2 - \frac{1}{2^{15}}\right) = \frac{3\times 2^{15} - 1}{2^{11}} = \frac{3\times 32768 - 1}{2048}$$

$$= \frac{98303}{2048}$$

(16) $P \in (AC)$



$$\frac{d(P,(AB))}{AB} = \frac{d(P,(BC))}{BC}$$

$d_7 \times AB = 3 \times 7$

$$d(P,(AB)) = \frac{21}{AB} \times \frac{x}{7} = \frac{3x}{AB} \qquad \frac{d(P,(AB))}{AB} = \frac{3x}{AB^2} = \frac{3x}{58}$$

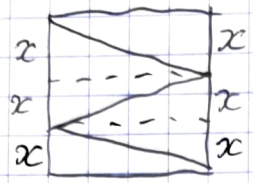
$d_7 \times BC = 3 \times 3$

$$d(P,(BC)) = \frac{3\times 3}{BC} \times \frac{x-4}{3} = \frac{3(x-4)}{BC} \qquad \frac{d(P,(BC))}{BC} = \frac{3(x-4)}{18} = \frac{x-4}{6}$$

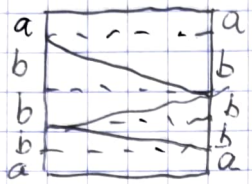
$$18x = 58(x-4) \qquad 9x = 29(x-4) = 29x - 116$$

$$20x = 116 \rightarrow x = \frac{58}{10} = 5{,}8$$

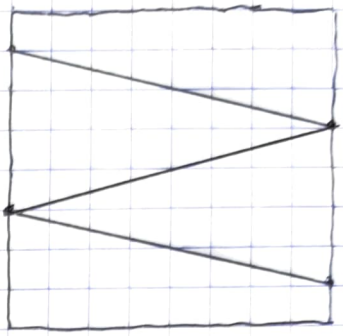
(17)



non

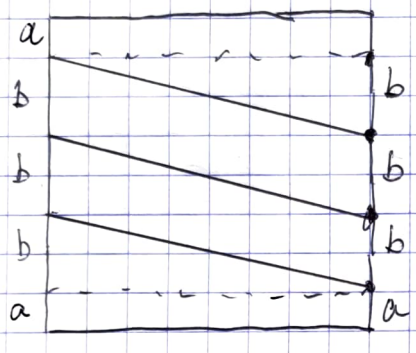


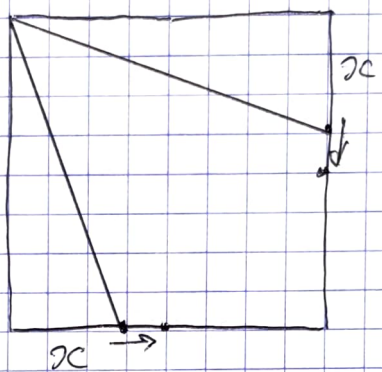
$a + b/2 = b \rightarrow b = 2a$



$b = 1/4 \quad a = 1/8$

$L_{max} = \sqrt{1 + 1/16}$?





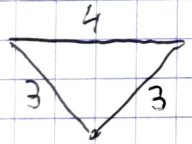
$x = 1/2$

$L_{max} = \sqrt{1 + 1/4}$

$= \sqrt{5}/2$

$\rightarrow x \simeq 1{,}118$? $\quad (\sqrt{2}/2 \leq x \leq \sqrt{2})$ OK

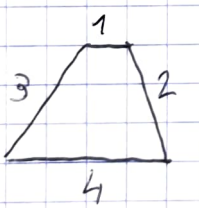
(18)



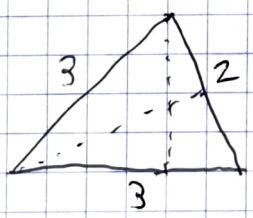
?

$h = \sqrt{9 - 4} = \sqrt{5}$

$A = 2h = 2\sqrt{5}$



?



$h_2 = \sqrt{9 - 1} = 2\sqrt{2}$

$A_1 = h_2 = 2\sqrt{2}$

$= \frac{3}{2} h_3 \rightarrow h_3 = \frac{4}{3}\sqrt{2}$

$A = 2\sqrt{2} + \frac{4}{3}\sqrt{2} = \frac{10}{3}\sqrt{2}$

$\simeq \frac{14{,}14}{3} \simeq 4{,}71$