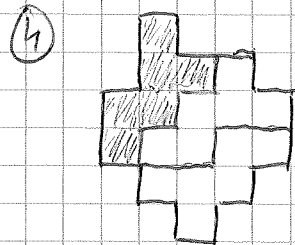
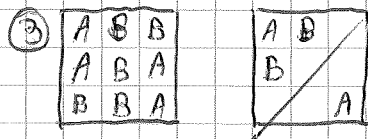


① 2 3 4 5 1

②

 $4 \times (2+4) = 24$

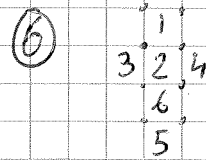


- ⑤ 18
27
36
45 1

- k : 2k sorties

8 sorties
↓
5 au départ

Personnes sorties : impair → 9?



6, 15, 14, 7, 12, 11, 10, 9

8 et 13

⑦ $6 \times 6 = 36$ $144 = 2^4 \times 3^2$
 36×36



$abde \times bcef = 6^2 \times 144^2$

$abc \times def = 144^2$

→ $b \times e = 6^2$

→ $b = d = f = h$

$144 = def = 6^2 f \Rightarrow f = 4 \Rightarrow e = 9$



→ $a = \frac{144}{6 \times 4} = 6$

⑧ $55 = \Delta_1 + \Delta_2 + \Delta_3 + \Delta_4 + \Delta_5 + \frac{10 \times 11}{2}$

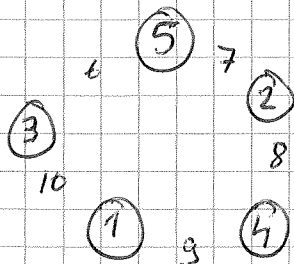
$= \sum \Delta_i + 55$

$\Rightarrow 1+2+3+4+5 = 15$

≥ 70 $S \geq 14$

14 - [6..10]

$\Delta_i + \Delta_j = 4, 5, 6, 7, 8$



$$\textcircled{9} \quad \text{En carrés: } 6 \times 6 - 5 - 5 - \left(4 \times \frac{3}{2}\right) - 6 = 14$$

$$4 \times 3 + 2 = 14$$

$$14 \times 25 = 70 \times 5 = \underline{350}$$

$\textcircled{10}$

c couples ($c \geq 1$)

h hommes seuls

H : total hommes. $H = h + c$

$$\frac{H(H-1)}{2} = 36 \rightarrow H = 9 \quad \text{ou } h = 9 - c$$

$$\text{Bises: } h \cdot c + c(c-1) + \frac{c(c-1)}{2} = 63$$

$$\text{ou } c(9 - c + c - 1 + \frac{c-1}{2}) = 63$$

$$c \frac{c+15}{2} = 63$$

$$c^2 + 15c - 126 = 0$$

$$\Delta = 225 + 504 = 729$$

$$\sqrt{\Delta} = 27$$

$$c = \frac{-15 + 27}{2} = 6$$

$$h = 3$$

$$\text{présentes: } 2 \times 6 + 3 = \underline{15}$$

① $6 = 5+7-6 = 4+7-5 = 3+7-4 = 2+7-3 = 1+7-2$

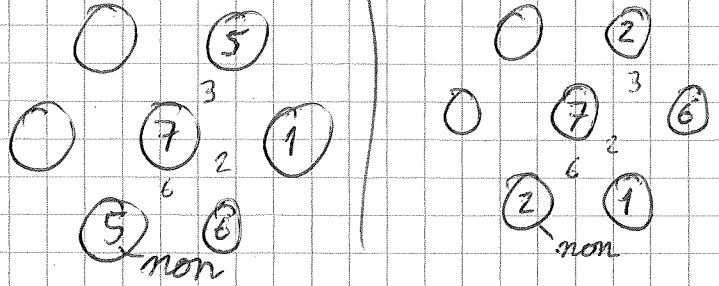
$Min < Max + Min - Milieu < Max$

• 7 au centre?

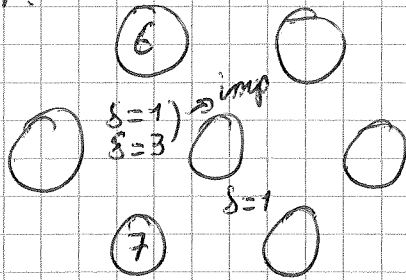
$2 = 7+1-6$

donc $3 = 7+1-5$ ~~non~~

ou $3 = 7+2-6$

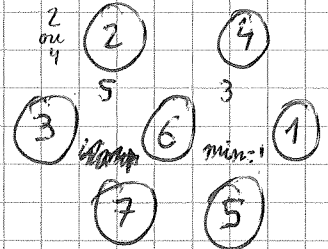
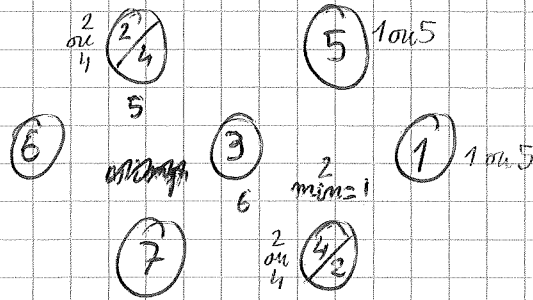


• Pos du 7:

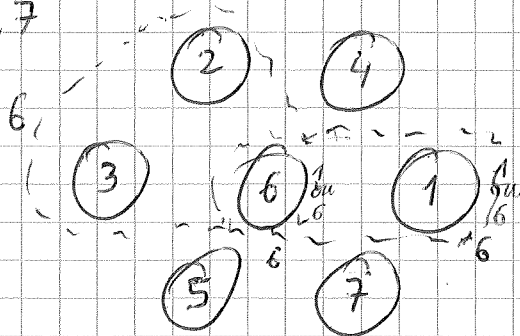


ou

ou



• Pos du 7



4 sel°

(12) • Noir au centre : 3

• Blanc au centre :

- FF : 2

- FA : 3

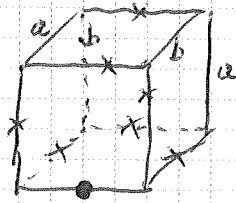
- FS : 2

- AA : 2 (\hat{m} face) + 1 (arêtes opposées) + 2

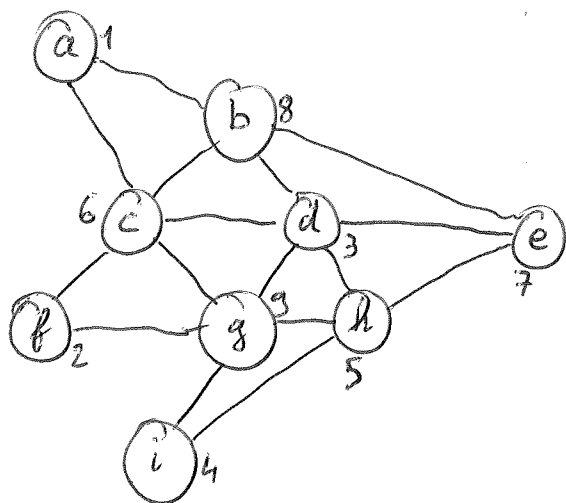
- AS : ~~1 (\hat{m} face)~~
1 (\hat{m} arête) + 2 (\hat{m} face) + 1 $\leftarrow 2/2$
 $\leftarrow 4/2$

- SS : 1 (\hat{m} arête) + 1 (\hat{m} face) + 1 (opposés)

22?



13



$$S = 1+2+\dots+9 = 45$$

$$\left. \begin{array}{l} a+b+i = 45 - 16 - 16 = 13 \\ a+b+e = 16 \end{array} \right) \rightarrow e = i+3$$

$$\left. \begin{array}{l} a+e+h = 13 \\ a+i+e+h = 16 \\ f+i+e = 13 \rightarrow f+2i = 10 \rightarrow i \leq 4 \end{array} \right) \rightarrow i = 4$$

$$\begin{aligned}
 (14) \quad 391613040 &= 2 \times 5 \times 39161304 \\
 &= 2^3 \times 5 \times 9790326 \\
 &= 2^4 \times 5 \times 4895163 \\
 &= 2^4 \times 3^2 \times 5 \times 543907 \\
 &= 2^4 \times 3^2 \times 5 \times 7 \times 77701
 \end{aligned}$$

$$\frac{n}{2} + \frac{n}{3} + \frac{n}{4} + \frac{n}{5} + \frac{n}{6}$$

$$\frac{n}{2} + \frac{n}{4} + \frac{n}{8} + \frac{n}{16} + \frac{n}{18} ?$$

$$\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{15} = 1 - \left(\frac{1}{8} - \frac{1}{15} \right) = 1 - \frac{7}{120}$$

$$120/7 = 17 \text{ resto } 1$$

$$\begin{aligned}
 &\rightarrow + \frac{1}{18} \\
 \frac{7}{120} - \frac{1}{18} &= \frac{140-3}{360} = \frac{137}{360}
 \end{aligned}$$

$$\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{14} = 1 - \left(\frac{1}{8} - \frac{1}{14} \right) = 1 - \frac{3}{56}$$

$$\frac{3}{56}$$

$$\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{9} = 1 - \frac{1}{72}$$

$$\frac{1}{2} + \frac{1}{4} +$$

$$\frac{1}{a} + \frac{1}{b} + \frac{1}{c} + \frac{1}{d} + \frac{1}{e} = \frac{1}{n} ?$$

15) $Q(n) = \sum_{i=1}^n i^5$ deg 6.

$S(n) = \sum_{i=1}^n i^7$ deg 8.

$3^5 = 243$

~~3~~ $4^5 = 1024$
 $+ 16384$

 17408

0 2 160 2430 ~~17408~~
17408

$a^5 + b^5 = (a+b)(a^4 - a^3b + a^2b^2 - ab^3 + b^4)$

$2^7 = 128$

$128 \cdot 21 \times 1000?$

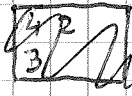
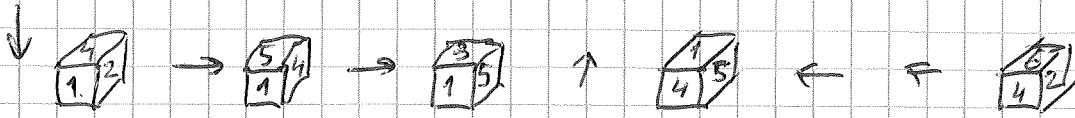
27?

$x^7 \quad \frac{1}{8}x^8$ ~~27?~~

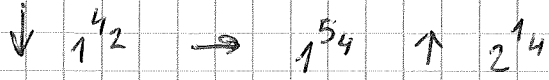
27?

①

pair



rotation



rotation $6 \times 2 = 12$