

⑦ $2 \times 4 \times 3 = 24$

⑧ $1+2+3+4+5+6+7+8+9 = 45$ imp

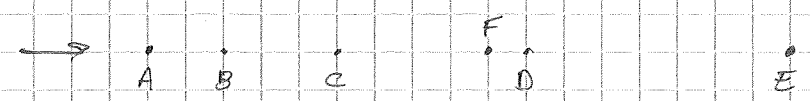
Pair: $1+2+3+4 = 10$

Q: 5 impairs, 4 pairs.

Q: 4 pairs: $2+4+6+8 = 20$

⑨ $1+2+3+5+7+8 = 9$

1) $2+3+5+7 = 8+9$



2) $1+2+3+5+7 = 9-8 = 1$

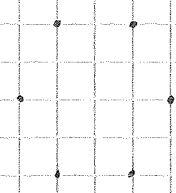
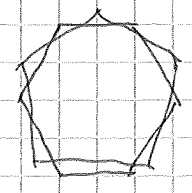
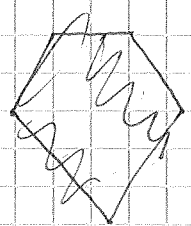
$1+2+3+5 = 1+7 = 8$ imp.

$1+2+3+5 = 1-7 = -6$ → $2-3-5+7+8 = 9$

3) ~~1+2+3+4+5~~ 2 sol^o: 15 et 17



⑩

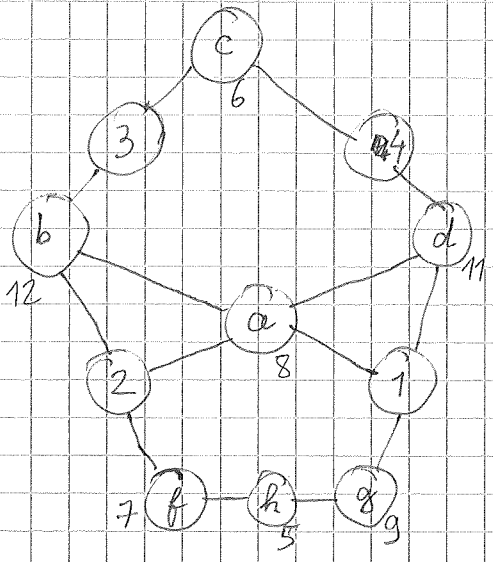


T/C: $2 \times 3 + 1$

P/H: $2 \times 5 + 1 = 11$

⑪

91



$S = a + b + 1$

$c = a - 2$

$d = b - 1$

$e = 4$

$f = a - 1$

$g = a + 1$

$h = b - a + 1 \Rightarrow b \geq a + 4$
 ≥ 5

1 2 3 4

$a - 2 \quad a - 1 \quad a \quad a + 1 \rightarrow$

$b - 1 \quad b$

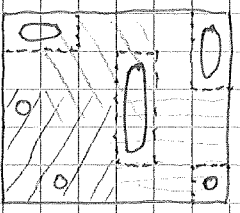
$b - a + 1$

• Si $h = 5$: $a = 8, b = 12 \rightarrow$ seule sol^o.

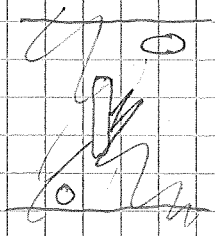
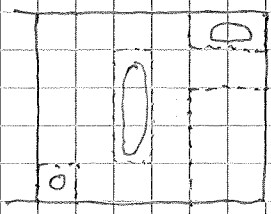
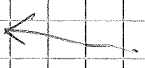
• Si $a = 7$: ~~non~~ ~~de~~ ~~la~~ ~~PA~~, ~~et~~ ~~de~~ ~~la~~ ~~PA~~ ~~imp.~~

$h \geq 3 \quad b = a + h - 1 \geq 15$ non.

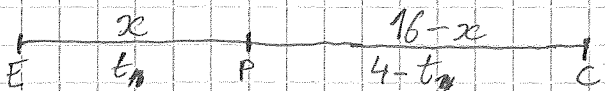
92



Orientation incorrecte \rightarrow PA vertical:



13



E → P avec 100L au départ.

P → C avec 1 chameau

C → P avec 1 chameau

P → E avec 2 chameaux

$$x = 4t$$

$$EP: 10L \text{ par h.} : 10t \times 2$$

$$PC: 7(4-t) \times 2$$

$$\text{Total: } 56 + 6t$$

Contrainte: ~~100L~~ 50L au retour

$$20t + 2(4-t) \geq 50$$

$$18t \geq 42 \quad t = 7/3$$

$$\text{Total consommé: } 56 + 14 = 70$$

reste 30



$$2 \times 7(4-t) = 12 \times \frac{5}{3} = \frac{20}{+30} = \frac{50}{50} \text{ OK.}$$

14

→ 1^{ère} ligne < 1^{ère} colonne.

	5	1	10	4	7
6	3	1	5	2	4
2	1		b		
8	4	a			
9	5	c			
3	2				

$a \leq b$
 $c \leq b$) → $b = 3$ ou 4

	3	1	5	2	4
1	4	3	5	2	
4	2				
5	3				
2	5				

5 imp

		10		7	
3	1	5	2	4	
1	5	4	3	2	
8	4	2	3	5	1
3	5	4	2	1	3
2	3	1	4	5	

OK

		1		4	
3	1	5	2	4	
2	1		4	5	
4	5				
5				4	
3	2	4			5

imp.

				7	
3	1	5	2	4	
1	5	3	4	2	
8	4	2	1	5	3
5	3				
2	4				

imp

				4	7
3	1	5	2	4	
1	2	4	5	3	
8	4	3	2		1
5	4				2
3	2	5		4	

imp

1 sol°

15

Pas de 0: son numéro est le 0.

Si $n \neq 0$ est caché: personne ne devine.

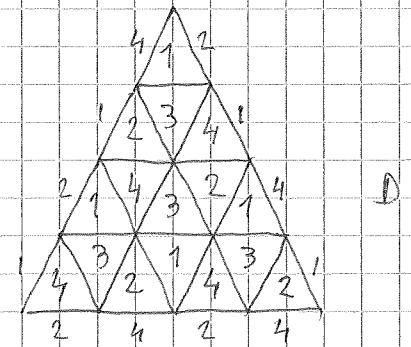
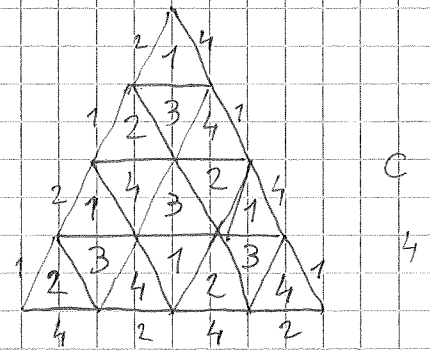
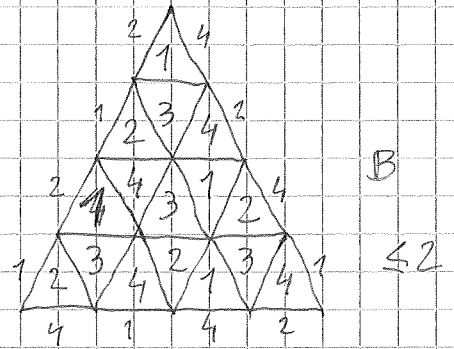
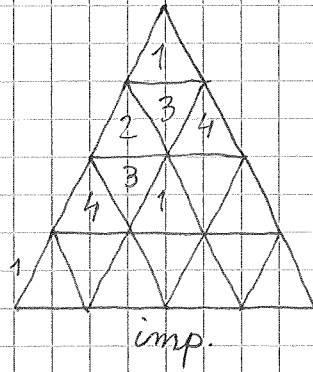
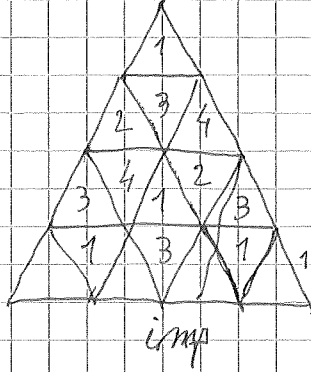
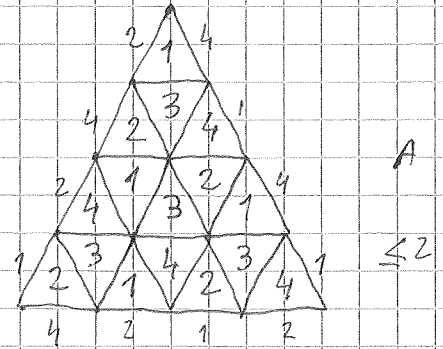
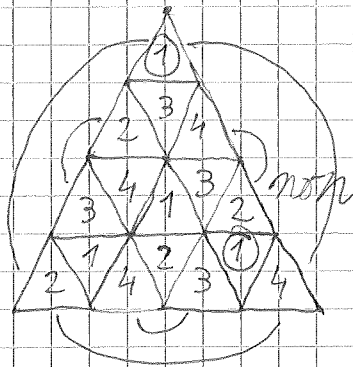
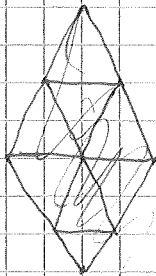
Si 0 est caché: la 1^{ère} personne à deviner a le 0.

Et le monde le sait → cela ne donne aucune info.
cela indique que c'est le 0 qui est caché.

La personne devine → 0 caché. $\frac{1}{2}$ → la suivante devine.

Position du 0:	#
1	2009
2	2008
3	2007
4	2006
5	2005

→ 5 sol°.



$A \neq B$

$A \neq C$

$B \neq C$

$D \neq C$
 $\neq A$
 $\neq B$

A: 4×1

B: 4×1

C: 4×2

D: 4×1

28

6 permutations de $\{1, 2, 4\}$

12 vues

#vues équivalentes?
 (≥ 2)

(18)

3	1			
3				
2	1	1	1	
2	3	2	1	2
1	1	2	3	3

Pas ~~de~~ chiffres = sur m rangée
4

(17)

b			
b	1	2	3
x	a	a	a

6 cases pour 3 chiffres ≠
impr

b		
b		
x	a	a

S = 2, 3, 4, 5 ou 6

3	1			
2	2			
2	1	1	3	
1	2	1	2	2
1	1	2	2	3

3/1				
3	2			
2	1	1		
1	2	1	2	
1	1	2	3	3

↔
d ≠

mod 3

3	1			
2	3			
2	1			
1	3		1	
1	1	2	2	3

18

$$11(12b + 21c + 28d) + 3 \times 4 \times 7a$$

~~2121~~ $2d \pmod{3}$

$$84a + 132b + 231c + 308d$$

$$a = -1$$

$$b = 6$$

$$c = \cancel{11} 3$$

$$d = 2$$

$$6 \times 132 = 792$$

$$3 \times 231 = 693$$

$$2 \times 308 = 616$$

$$- 84$$

$$2017?$$