

7

M: 35  
C: 17

$$\frac{35-17}{2} = \boxed{9}$$

9

~~MA~~ S O B

A: n O ~~et~~ ou B

→ SOBE

E: n B uniquement

→ SOABE

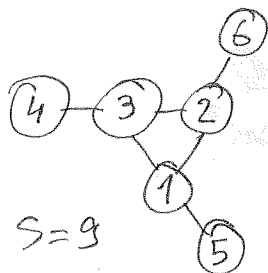
10

# croisements: 2. →  $64 - 4 \times 3 + 1$  ~~nBA nBn~~  
 $= \boxed{53}$

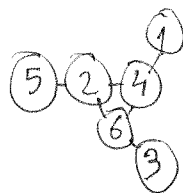
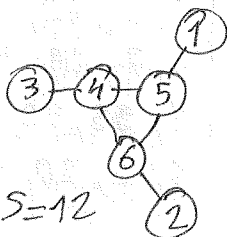
11

$S \geq 2+3+4=9$

$S \leq 3+4+5=12$



sym →  
7-x



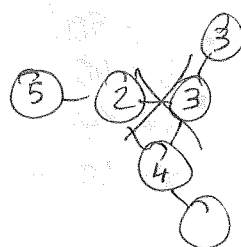
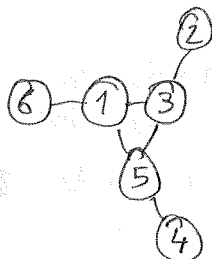
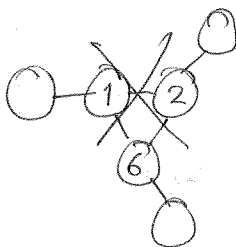
↑ sym. 7-x

S=10!

$$3S = \underbrace{1+2+\dots+6}_{21} + \Delta$$

$$30 = 21 + \Delta \rightarrow \Delta = 9$$

$$\begin{aligned} 9 &= 1+2+6 \\ &= 1+3+5 \\ &= 2+3+4 \end{aligned}$$



B sol: 6, 15 et 120

4 sol: 6, 15, 48 et 120

~~nBA~~

S=9 → Δ=6

S=10 → Δ=9

S=11 → Δ=12

S=12 → Δ=15

(12)

7, 16, 25, ...

7, 16, 25, 34, 43, 52, 59, 61 — 77, 86, 95, 106

$a9_3 \rightarrow (a+1)0_3$

$96 \rightarrow 185$

$0 \leq a \leq 8$

$96 \rightarrow 15$

97

98

$99 \rightarrow 18$

100

101

102

103

104

105

$\rightarrow 96$

(15)

$81 \times 3$

$49 \times 7 = 343$

$abc = x^4$

128	243	125	343
256	729	625	
512			

$729 - 125 = 604$

(16)

$1 < a < b < c$

$c > 40$

~~$c = 40?$~~   ~~$140 = 40 + 40 + 30 + 30$~~

$b \neq 30$  car  $130 = 40 + 3 \times 30$

$b \neq 20$

$b \neq 10$   $40 + 40 + 9 + 9 < 140 \rightarrow$  non

$c = 50?$

$b \neq 40$   $(50 + 50 + 40)$

$b \neq 30$   $(50 + 50 + 30)$

$b = 20 \rightarrow 50 + 50 + 20 + 20 = 140$

$130 = 50 + 4 \times 20$

$a = 3, 6, 7, 8, 9$

~~$50 + 50 + 9 + 9 + 9 = 130$~~

~~$50 + 50 + 20 + 9 + 1 = 130$~~  non

$50 + 50 + 20 + 9 < 130$

$c = 60?$

$\rightarrow$  pas de 40, 30, 20, 10

$\rightarrow$  imp.

1, 3, 20, 50

1, 6, 20, 50

1, 7, 20, 50

1, 8, 20, 50

1, 9, 20, 50

~~4 sol~~

5 sol

$c = 70?$  non

$c = 80?$

$\rightarrow$  pas de 70, 60, 40, 20, 10

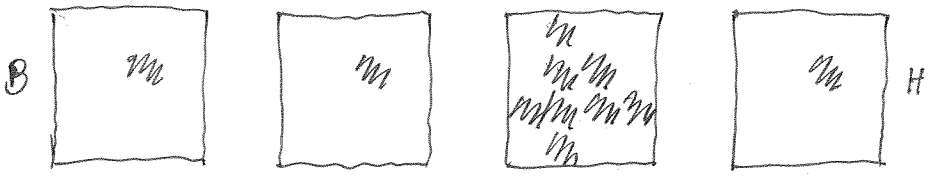
$\rightarrow$  pas de 30  $(30 + 30 + 80)$

$\rightarrow b = 50 \rightarrow$  non (130)

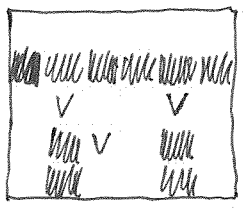
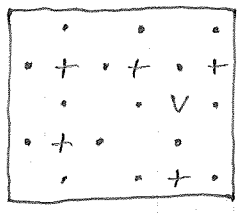
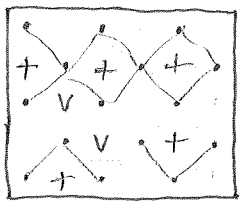
$c = 90?$

$\rightarrow$  pas de 50, 40, 30, 20, 10

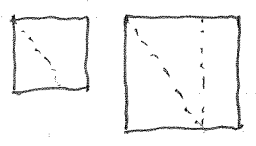
non.



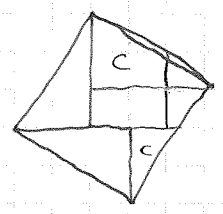
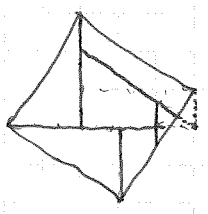
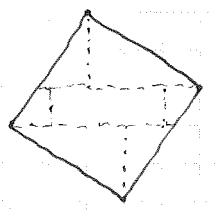
13  $\rightarrow 2 \times 5 = 10$



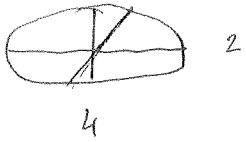
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$\sqrt{13} \times \sqrt{13}$   $13 = 2^2 + 3^2$   
77



(17)



$$\begin{aligned} | &\rightarrow H=1 \rightarrow 4 \\ D=2? &\rightarrow R=1? \end{aligned}$$

~~$$x^2 + y^2 + z^2$$~~

$$\begin{cases} x^2 + 4y^2 + 16z^2 = 4 \\ ax + by + cz = 0 \\ x^2 + y^2 + z^2 = r^2 \end{cases}$$

$$(by + cz)^2 + 4y^2 + 16z^2 = 4$$

$$(b^2 + 4)y^2 + (c^2 + 16)z^2 + (2bc)yz = 4$$

$$3y^2 + 15z^2 = 4 - r^2$$

$$y^2 = \frac{4 - r^2}{3} - 5z^2$$

$$(b^2 + 4)\left(\frac{4 - r^2}{3}\right) - 4$$

$$+ (c^2 + 16 - 5(b^2 + 4))z^2$$

$$= -2bcyz$$

$$\begin{cases} x^2 + 4y^2 + 16z^2 = 4 \\ x + by + cz = 0 \\ x^2 + y^2 + z^2 = r^2 \end{cases}$$

~~$$(b^2 + 4)\left(\frac{4 - r^2}{3}\right) - 4 = -2bcz$$~~

$$(by + cz)^2 + y^2 + z^2 = cte$$

$$A = (b^2 + 4)\left(\frac{4 - r^2}{3}\right) - 4$$

$$B = (c^2 - 5b^2 - 4)$$

$$(A + Bz^2)^2 = 4b^2c^2\left(\frac{4 - r^2}{3} - 5z^2\right)z^2 \quad \forall z$$

$$\rightarrow A = 0$$

$$2AB = 4b^2c^2\left(\frac{4 - r^2}{3}\right)$$

$$B^2 = -20b^2c^2 \quad ???$$

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

$$2\sqrt{2} = 2,828 \dots$$

~~1 + \sqrt{2}~~

$$2 \times (2\sqrt{2} - 2)$$

$$\sqrt{2} \approx \frac{p}{q}$$

$$n(\sqrt{2n^2} - \sqrt{k^2}) = f(n)$$

$$f(n)^2 = n^2(2n^2 + k^2)$$

$$2n^2 - k^2 = 1$$

$$\frac{1}{5} = \frac{1}{7}$$

~~12512~~

$$n=3 \rightarrow 3(\sqrt{18} - 4) = 9\sqrt{2} - 12$$

$$n=5 \rightarrow 5(\sqrt{50} - 7) = 25\sqrt{2} - 35$$

$$12 \rightarrow -1$$

$$\frac{16\sqrt{2} - 23}{512} < 0$$

$$n=2 \rightarrow 4\sqrt{2} - 2$$

$$n(\sqrt{2n^2} - \sqrt{2n^2 - 1}) = \frac{n}{\sqrt{2n^2} + \sqrt{2n^2 - 1}}$$

$n \rightarrow +\infty$

$$\rightarrow \frac{1}{\sqrt{2} + \sqrt{2}} = \frac{1}{2\sqrt{2}}$$

$$\frac{7}{5} = 1 + \frac{2}{5} = 1 + \frac{1}{2 + \frac{1}{2}}$$

$$\frac{1}{1} = \frac{3}{2} = \frac{7}{5} = \frac{17}{12} = \frac{41}{29}$$

~~1/2~~

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

$$\frac{5}{12} = \frac{17}{12}$$

$$14\sqrt{2} - 20$$

$$12\sqrt{2} - 17$$

$$29\sqrt{2} - 41$$

$$25\sqrt{2} - 35$$

$$\frac{841\sqrt{2} - 1189}{25\sqrt{2} - 35} < 0$$

$$\frac{1681}{3364}$$

$$816\sqrt{2} - 1154 < 0$$

$$\begin{array}{r} 841 \\ \times 29 \\ \hline 369 \\ 82 \\ \hline 1189 \end{array}$$

$$\begin{array}{r} 816 \\ \times 816 \\ \hline 4896 \\ 816 \\ \hline 6528 \\ \hline 665856 \\ \times 2 = 1331712 \end{array}$$

$$\begin{array}{r} 1154 \\ \times 1154 \\ \hline 4616 \\ 5770 \\ \hline 1154 \\ \hline 1154 \\ \hline 1331716 \end{array}$$