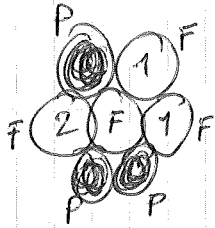


①



②

résultat divisible par 11 et < 200

$$91 + 99 = 190$$

③

6

④

3459 ~~28543~~

$$954 \times 3 = 2862$$

$$943 \times 5 = 4715$$

$$543 \times 9 = 4887$$

$$94 \times 53 = 4982$$

$$93 \times 54 = \underline{5022}$$

⑤

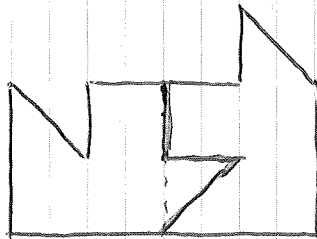
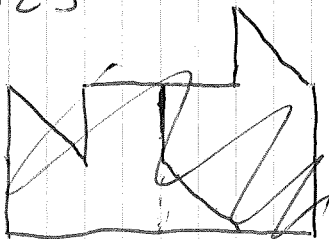
$$a + b + a = \overline{bc}$$

$$b + c = b \rightarrow c = 0$$

$$2a + b = \overline{b0} \rightarrow b \text{ pair} = 2$$

929

⑥



⑦

Au + 13g Au + 13g
11 filles

→ 24

⑧

9: 49
7: 27 ~~et 72~~) → ^{52g} 72 - 49
81
32
25

728163549

81561

⑨

$$75 \times 36 = 3 \times 25 \times 4 \times 9 = 2700$$

↳ 27

$$84\% = 63$$

$$27 = 13 \text{ et } +$$

$$63 = 13 \text{ et } -$$

$$\overline{90} - 75 = \underline{\underline{15}}$$

$$\begin{array}{r} \overline{12} + \overline{15} + \overline{48} \\ 14+ \quad 13 \quad 12- \end{array}$$

⑩ 2 en touchant les pièces extrêmes?

20 20 20

$$177 \equiv 17 [20]$$

17
37
57

11 11 11 11 11

3 3 3 3 3 3

$$55 + 21 = 76$$

~~60 + 55 = 115~~

$$57 = 33 + 24 \text{ non}$$

$$37 = 22 + 15$$

$$2 \times 11 + 5 \times 3$$

$$7 \times 20 + 2 \times 11 + 5 \times 3$$

$$7 + 2 + 5 = 14$$

7 pièces de 20 - 3 \rightarrow 4 pièces transf.

~~11~~ 12/25

⑫ Gros disque: πr^2 où carré = $4r^2$

\hookrightarrow ~~11/14~~

$$\text{Petit carré: } (r\sqrt{2})^2 = 2r^2$$

$$\frac{1}{2} \text{ petit disque: } \frac{1}{2} \pi \left(\frac{r\sqrt{2}}{2} \right)^2 = \frac{\pi}{4} r^2$$

$$\frac{1}{4} \text{ petit carré: } \frac{1}{2} r^2$$

$$2 \text{ petits arcs: } \left(\frac{\pi}{4} - \frac{1}{2} \right) r^2 = \left(\frac{11}{14} - \frac{1}{2} \right) r^2 = \frac{4}{14} r^2 = \frac{2}{7} r^2$$

$$6 \text{ " " : } \frac{6}{7} r^2$$

$$4 \text{ gds arcs: } (\pi - 2) r^2 = \left(\frac{22}{7} - \frac{14}{7} \right) r^2 = \frac{8}{7} r^2$$

$$\frac{8+6}{7} r^2 = 2r^2 \rightarrow 50\%$$

11

2 x 56 = 112 OK

2 5 6
1 1 2
↑

2 x 6 .

1 2

2 x 6 6

1 3 2

3 x 4 1

1 2 3

3 x 4 4

1 3 2

3 x 5 1
1 5 3

non

3 x 5 4
1 6 2

3 x 6
2

non

4 x 3 1
1 2 3

4 x 3 6
1 4 4

4 x 4 1
1 6 4

4 1 4
1 3 6
3 3 3
6 1 3

non

4 x 5 6
2 3 .

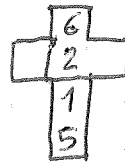
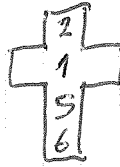
non

5

4 x 6

non

2
3
5



2
1
5
6

6
2
1
5

non

2
1
5
6

6
3
1

non

3
1
4
6

4
2
3

non

3
1
4
6

4
3

non

3
1
4
6

5
6
2
1

non

4
1
3
6

non

4
1
3
6

3
4 non

5 x 2 5 non
1 1
2
6

5 x non
1
2
6

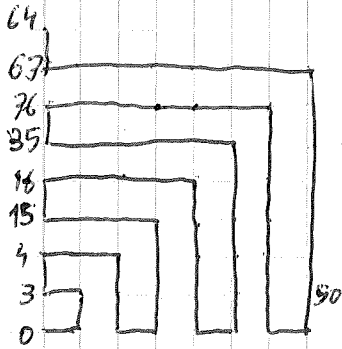
5 x 5 non
3
2
4

6 x 2 non
2
1
5

6 x 6 non
3 4 1
1 4 3

6 x 6 non
4 1 3
4 1 3

13



0	0	4	16	36	64
		4	12	20	28
		8	8	8	
		0	0		

$$4n(n-1) + 4n = 4n^2$$

$$0: (0, 0)$$

$$4: (0, 2)$$

$$16: (0, 4)$$

$$36: (0, 6)$$

$$4n^2: (0, 2n)$$

$$4 \times 22^2: (0, 44) \rightarrow 1936$$

$$1936 + 44 = 1980$$

$$2011$$

~~2011~~

$$20^2 = 400$$

$$21^2 = 441$$

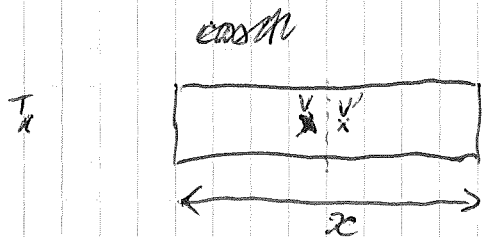
$$22^2 = 484$$

$$\begin{array}{r} \times 4 \\ \hline 1936 \end{array}$$

$$(44, 44)$$

$$(44, 13)$$

14



$$\frac{3000}{v_T} = \frac{x/2 - 5}{v_T}$$

$$\frac{3000+x}{v_T} = \frac{x/2 + 5}{v_T}$$

$$\frac{3000}{x/2 - 5} = \frac{3000+x}{x/2 + 5}$$

cross cos 2 ?

$$\frac{3000}{x/2 + 5} = \frac{3000+x}{x/2 - 5}$$

$$3000(x/2 - 5) = (3000+x)(x/2 + 5)$$

$$\frac{x^2}{2} + 5x + 30000 = 0$$

non

$$3000(x/2 + 5) = (3000+x)(x/2 - 5)$$

$$30000 = \frac{x^2}{2} - 5x$$

$$x^2 - 10x - 60000 = 0$$

$$\Delta' = 25 + 60000 = 60025$$

$$x = \frac{10 \pm \sqrt{60025}}{2} = 5 \pm \sqrt{2401} = 5 + 5 \times 49$$

$$= 5 \times 50 = \underline{\underline{250 \text{ m}}}$$

$$60025 / 5 = 12005$$

$$12005 / 5 = 2401$$

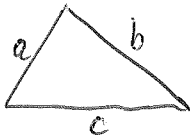
$$49^2 = 2401$$

$$\frac{3000}{x/2 - 5} = \frac{3000}{120} = 25$$

$$\frac{3250}{130} =$$

$$25 \times 13 = 325$$

15



$$a < b < c$$

$$a + b > c \quad a + b \leq c$$

$$\frac{b}{c} = \frac{a}{b} \rightarrow$$

$$b^2 = ac$$

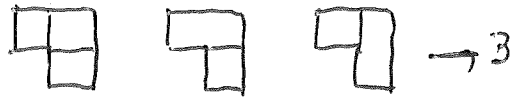
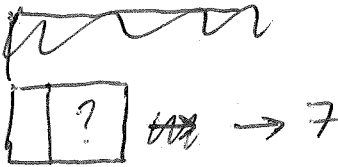
$$b^2 = a(a+b) \quad b=1$$

$$a^2 + a - 1 = 0$$

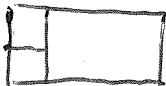
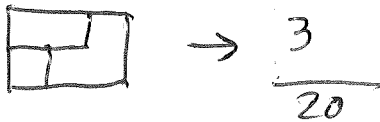
$$a = \frac{-1 + \sqrt{5}}{2} \quad \text{and} \quad \frac{-1 - \sqrt{5}}{2} \quad \text{are crossed out}$$

$$= \frac{1,236}{2} = 0,618 \quad \text{OK}$$

16



$$D_3 = C_2 + D_2 = 7 + 3 = 10$$



$$C_4 = 2(C_3 + D_3)$$

$$= 60$$

$$D_4 = C_3 + D_3 = 30$$

$$C_5 = 2(C_4 + D_4) = 180$$

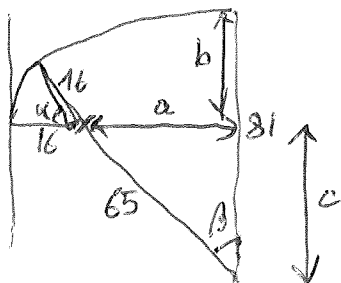
$$D_5 = 90$$

$$C_6 = 540$$

$$D_6 = 270$$

$$C_7 = 2 \times 810 = \underline{1620} \quad ?$$

17



$$169 - 144 = 25$$

$$(5, 12, 13)$$

$$L = 2(a + 16)$$

$$l = 2b$$

$$c^2 + a^2 = 65^2$$

2c entier

2a entier

$$b = 81 - c$$

→ a et c entiers

$$13 \times 3$$

$$25$$

$$13 \times 4$$

$$60$$

$$13 \times 5$$

$$65$$

$$\{a, c\} = \{33, 52\}$$

$$\cancel{(l, L) = (58, 110)}$$

$$\text{ou } (84, 136)$$

8 sol^o

$$\{25, 60\}$$

$$(l, L) = (42, 82)$$

$$(112, 152)$$

$$a^2 = (65 - c)(65 + c)$$

$$u^2 - v^2$$

parités ≠

$$2uv$$

$$u^2 + v^2$$

$$u^2 + v^2 = 65 = 1^2 + 8^2 = 4^2 + 7^2$$

$$(8, 1): 63^2 + 16^2 = 65^2$$

$$\{16, 63\}: (36, 64)$$

$$\text{ou } (130, 2 \times 79)$$

$$(7, 4): 33^2 + 56^2 = 65^2$$

$$\{33, 56\}: (50, 98)$$

$$(96, 144)$$

18

$\overline{ab} \quad \overline{cd} \quad \overline{e0}$

$$mnp \approx 100(m+n+p)$$

$$m+n+p$$

$e=1 \rightarrow bd \equiv b+d \pmod{10}$
 $(b-1)(d-1) \equiv \text{LADP} \pmod{1}$

1010

1020

17 x 60

5060

1040

11 x 46 x 10

1050

22 x 23 x 10

1080

2010

67 x 2 x 5

2020

2030

~~2030~~ 29 x -

2040

17 x 120

10 x 12 x 17

300

3030

3080

454

227

3060

151

~~22075~~

3050

181

3040

452

226

113

3030

301

43 x 7 x 2 x 10

3020

451

41 x 11 x 2 x 10

8040

82 x 11 x 10

~~7060~~

201

10 22

7040

67

353

6050

352

11 x 32 x 2 x 10

11 x 55 x 10

22 32 10