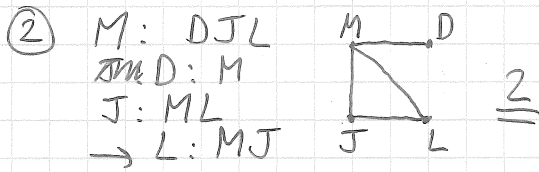


① $13 + \overline{x5} = \overline{(x+1)8}$
 $1 + \overline{3x} + 5 = 3 \overline{(x+6)}$
 $\rightarrow x = 2$

⑧ $\begin{matrix} (1) & (3) & \text{un} \\ 229 & 58 & 37 & 31 & 7 & 28 & 34 & 19 \\ & & 37 & & & & & \\ & & (3) & & & & & \end{matrix}$
 $37: 6k+3$
 $2017 = 6k+1 = 6k'+7$



$\rightarrow \underline{\underline{34}}$

⑨ $\begin{matrix} 0 & n & 2n+2 & 3n+6 \\ n_1 & n_1+2 & n_1+4 & n_1+6 \\ & 2 & 2 & 2 \end{matrix}$

③

A 1	C 2	B 3
C 3	B 1	A 2
B 2	A 3	C 1

$kn + k(k-1) = 55$
 $k(n+k-1) = 55 \quad k > 1$
 $k=5 \rightarrow n+k-1=11 \rightarrow n=7$
 $k=11 \rightarrow n+k-1=5 \rightarrow n = \text{imp.}$
 $7+9+11+13+15 = 55 \quad \text{OK.}$

④ $A+B+C+D+E+F+G$
 $A+B=6$
 $A+B+C=11 \rightarrow C=5$
 $B+C+D=11 \rightarrow D=A$
 $C+D+E=11 \rightarrow E=B$
 $E=5$ (comme C)
 $F=C=5$
 $1+5+5+1+5+5+1 = \underline{\underline{23}}$

⑩ $\frac{a^2h}{3}$ et $\frac{a^2(a-h)}{3}$
 $h \neq \frac{a}{2} \rightarrow 2 \text{ val. sinon } 1.$

⑤ 4 colonnes de 3 gris + 1
 $= 4 \times 3 + 1 = \underline{\underline{13}}$

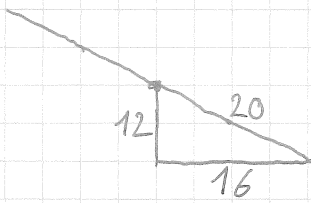
Impair $\Rightarrow h_1 = \frac{a}{2}$
 $h_2 \neq \frac{a}{2} \quad h_3 = h_1 \text{ ou } h_2$
 3 cas: 17, 18,5, 20
 14, 17, 20
 17, 20, 23
 $\hookrightarrow \text{ou } a^3/6$

⑥ $256 = 2^8 = 2^3 \times 2^5 = 8 \times 32$
 $1056 = 11 \times 96 = 2^5 \times 3 \times 11$
 $= 32 \times 33$
 $8 + 32 + 33 = \underline{\underline{73}}$

$a^3 = 102, 111 \text{ ou } 120$
 3 sol^o

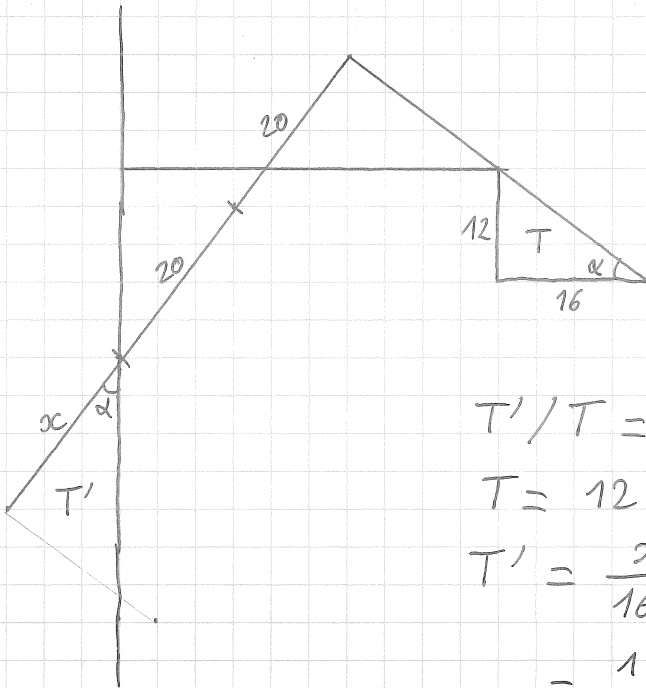
⑦ A: x x x x o
 B: o x o x x (3)
 C: x o o o x
 D: x x x o o
 E: o o x x x $\rightarrow \underline{\underline{3}}$

13



$$l = 40 \quad L = ?$$

$$x = L - 40$$



$$T'/T = (x/16)^2$$

$$T = 12 \times 16 / 2$$

$$T' = \frac{x^2}{16 \times 16} \times \frac{12 \times 16}{2} = \frac{3}{8} x^2$$

$$= \frac{1}{80} \times 40 \times (x + 40)$$

$$3x^2 - 4(x + 40) = 0$$

$$3x^2 - 4x - 160 = 0$$

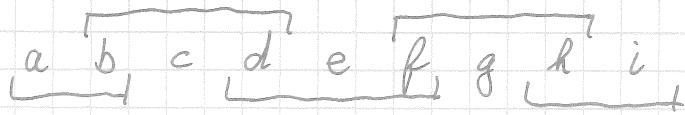
$$\Delta' = 4 + 3 \times 160 = 484 = 22^2$$

$$x = \frac{2 + 22}{3} = 8$$

$$(192 - 4 \times 48 = 0)$$

$$L = 40 + x = \underline{\underline{48}}$$

14



$$i = f + g \quad a = c + d$$

$$3S + c + g = 45 \rightarrow S \leq 14$$

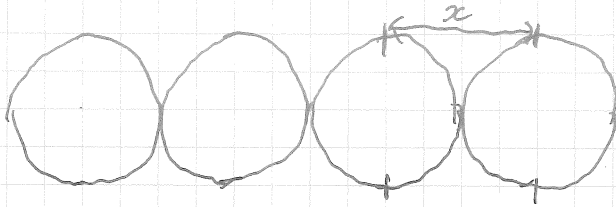
$$S > 11$$

$$2S + a + e + i = 45$$

$$(9 = 1 + 8, 7 = 2 + 5)$$

$$c + g \leq 13?$$

15



$$+ 1 \text{ cyl} \rightarrow + 2x \quad x = 2r$$

$$n \text{ cylinders} \rightarrow 2\pi r + 2(n-1)x$$

$$= (2\pi + 4(n-1))r$$

$$(2\pi + 24)r = 914$$

$$30,28r \approx 914$$

$$30,28 \times 30 = 908,4$$

$$30,28 \times 0,2 = 6,056$$

$$\text{---} \times 30,2 = 914,456$$

$$\rightarrow r \approx 30,2 \text{ mm}$$

$$2x = 4r \approx 120,8 \text{ mm} \quad \underline{\underline{121}}$$

16

$$\frac{4}{2017}$$

$$\frac{2017}{4} = 504 + \frac{1}{4}$$

$$\frac{4}{2017} = \frac{1}{504 + \frac{1}{4}} < \frac{1}{504}$$

$$\frac{1}{m} + \frac{1}{n} + \frac{1}{mn} ?$$

$$7120010 = 10 \times 712001$$

712001	503
503	1415, ...
2030	
2012	
780	
503	
2771	

$$712001 \quad \overline{504 \quad 498}$$

7120010	502
2100	14418, ...
920	
4181	
4016	
1650	

3 non $12001 / 7 = 1714, \dots$

an $7120010 = 505 \times 14240 + 10$

712001	13
62	5476, ...
100	
90	
121	

712001	17
32	4188, ...
150	
136	
140	
41	

712001	499
499	1442, ...
2130	
1340	
3421	

$$498 = 249 / 3, \dots$$

$$71497$$

$$3 | 495$$

$$494 = \cancel{2 \times 247} \quad 2 \times 247 \quad \text{div par } 13$$

$$493 \quad \text{div par } 17$$

$$492 \quad \text{non}$$

$$491$$

712001	491
491	144
2210	

712001	19
57	3747, ...
142	
90	
140	
71	

16 suite

$$\begin{array}{r|l} 712001 & 23 \\ 220 & \\ 130 & 395 \cancel{0} 6, \dots \\ 151 & \end{array}$$

$$\begin{array}{r|l} 712001 & 491 \\ 491 & \\ \hline 2210 & 145, \dots \\ 2460 & \\ 51 & \end{array}$$

$$3 \mid 489 \quad 487$$

$$\begin{array}{r|l} 712001 & 487 \\ 487 & \\ \hline 2250 & 1462, \dots \\ 3020 & \\ 981 & \end{array}$$

$$3 \mid 486 \quad 485$$

$$\begin{array}{r|l} 7120010 & 485 \\ \hline & \end{array}$$

7121

$$\begin{array}{r|l} 712001 & 2017 \\ 6051 & \\ \hline 1 & 3 \end{array}$$

$$\textcircled{18} \quad 123456789 / 9 = 13717421$$

$$(n+a^2)b^2n = 123456789$$

n impair

a pair

b impair ~~(3?)~~ (3?)

$$\begin{array}{r} 1234567890 \\ - 123456789 \\ \hline \end{array}$$

$$111111101$$

$$9(n+a^2)b^2n = 111111101$$

$$999999909 = 10^{10} - 91$$

$$1000^2 \times 9 = 9000000$$