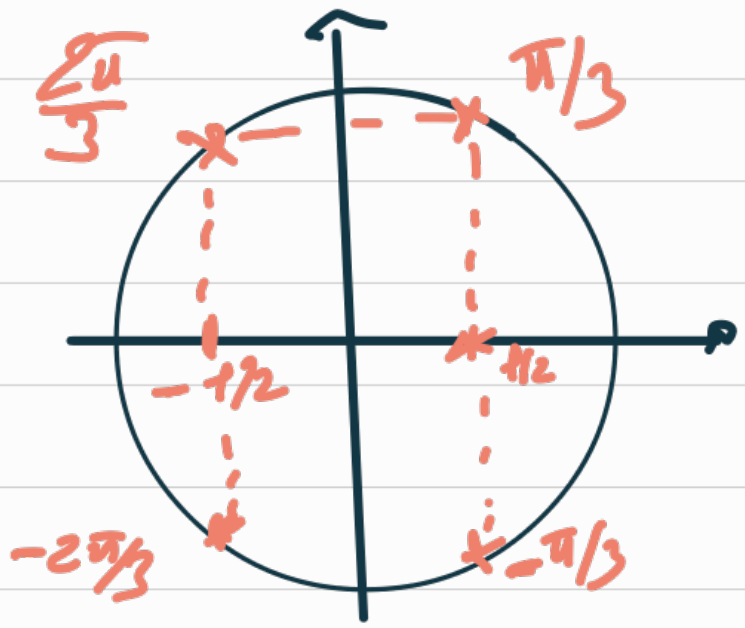
# Automatismes

1) $50 \times 0{,}2 = 100 = 10$

$50 - 10 = 40$ €

$50 \times \underbrace{\left(1 - \frac{20}{100}\right)}_{0{,}8}$

2) $\cos\left(\frac{-\pi}{3}\right) = \frac{1}{2}$



3) $\left(1+\frac{20}{100}\right)\left(1-\frac{20}{100}\right)$

$= (1+0,2)(1-0,2)$

$= 1,2 \times 0,8$

$= 0,96$

$\Rightarrow$ baisse de 4 %.

donc $T_1 < T$

$\begin{array}{r} {}^{1}12 \\ \times 8 \\ \hline 96 \end{array}$

4) $y = -\frac{2}{3}x + 2$

- $(0;2)$ : $-\frac{2}{3} \times 0 + 2 = 2$ ✓
- $(3;0)$ : $-\frac{2}{3} \times 3 + 2 = -2+2 = 0$ ✓

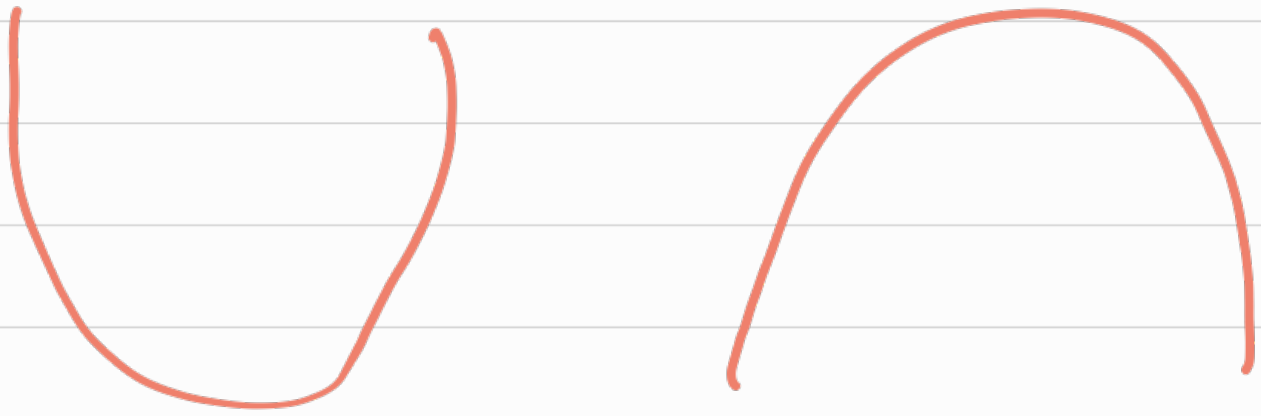
- $a = \frac{y_B - y_A}{x_B - x_A} = \frac{0-2}{3-0} = -\frac{2}{3}$

5) $\cos(-x) = \cos(x)$.

$\sin(-x) = -\sin(x)$.

6)

$\Rightarrow a > 0$



$a > 0$ $\quad$ $a < 0$

en 0 : $(0; -2)$

$c$

ordonnée à l'origine $= c$

7) $S = 1 + \cdots + 2^{19}$

$= \dfrac{1 - 2^{20}}{1 - 2}$

$= \dfrac{1 - 2^{20}}{-1} = -(1 - 2^{20})$

$= 2^{20} - 1$

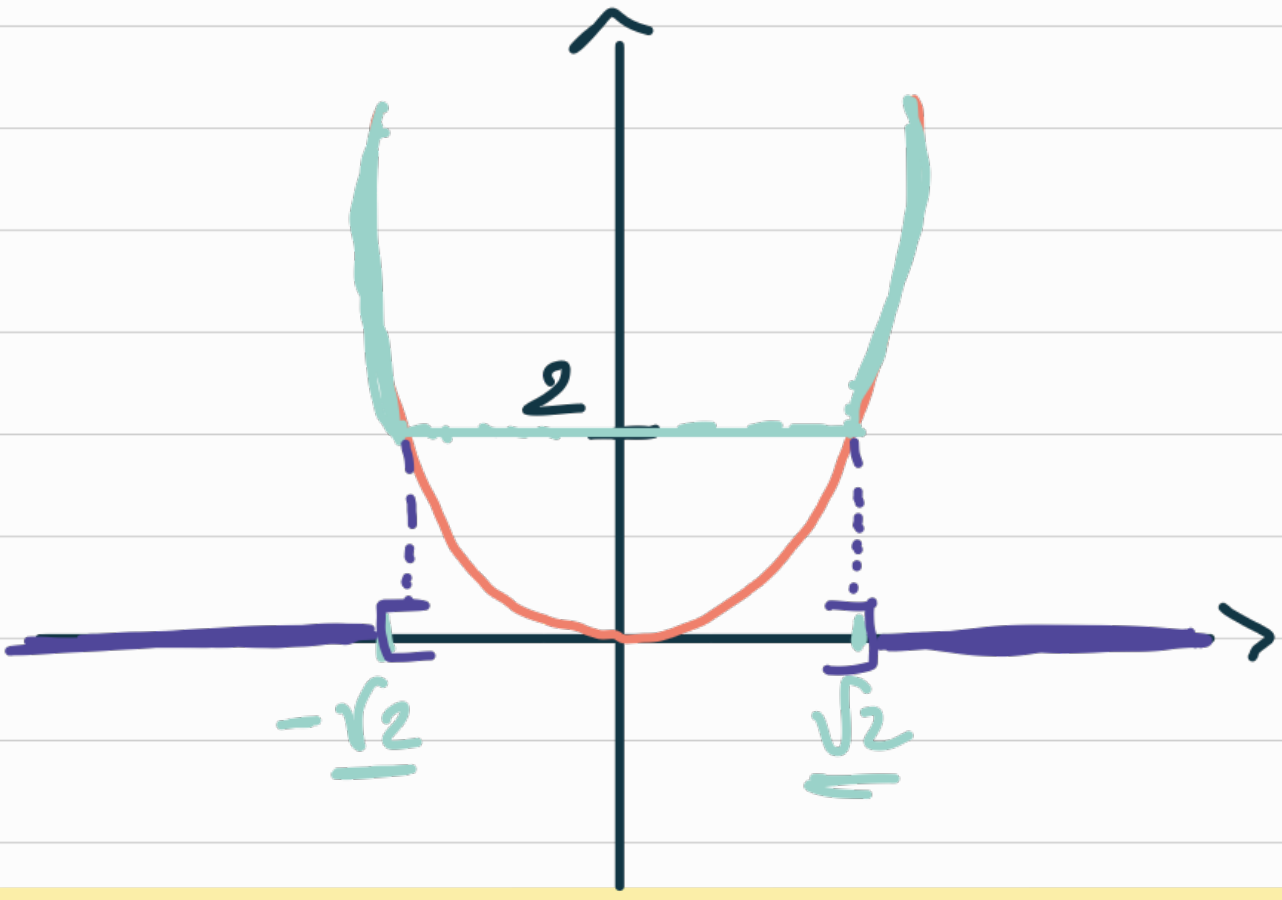
$$S = 1 + q + \cdots + q^n$$

$$= \frac{1 - q^{n+1}}{1 - q}$$

8)

| $x$ | $-\infty$ | | $-2$ | | $1$ | |
|---|---|---|---|---|---|---|
| $3x-3$ | $-$ | $-$ | $\|$ | $-$ | $0$ | $+$ |
| $x+2$ | $-$ | $0$ | $+$ | $\|$ | $+$ | |
| $g$ | $+$ | $0$ | $-$ | $0$ | $+$ | |

9)




$x^2 > a \Rightarrow ]-\infty; -\sqrt{a}[ \cup ]\sqrt{a}; +\infty[$

$x^2 < a \Rightarrow ]-\sqrt{a}; \sqrt{a}[$

10) $v = \sqrt{2gh}$

$v^2 = 2gh \iff \frac{v^2}{2g} = h$

11) $P(B) = \frac{1}{4} \times \frac{2}{3} + \frac{3}{4} \times \frac{1}{2}$

$= \frac{2}{12} + \frac{3}{8}$

$= \frac{1}{6} + \frac{3}{8}$

$= \frac{8 + 18}{48}$

$= \frac{26}{48} = \frac{13}{24}$.

12) • $3,6 \times 0,5 = 1,8$ ✗

• $3,6 \times 21 = 756$ ✗

- $3,6 \times 5,3 = 19,08$ ✗
- $3,6 \times 2,1 = 7,56$ ✓

$$36 \times 53$$

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$$\frac{7,56}{3,6} = 2,1$$

$2 - 1 = 1$

| 756 | 36 |
|---|---|
| | 21 |

# exercice 3 :

1) $D'(x) = x^2 - 8x + 12$

2) $\Delta = 16 > 0$

$$x_1 = \frac{-b - \sqrt{\Delta}}{2a} = 2$$

$$x_2 = \frac{-b + \sqrt{\Delta}}{2a} = 6$$

| $x$ | $0$ | | $2$ | | $6$ | | $7$ |
|---|---|---|---|---|---|---|---|
| $D'$ | | $+$ | $0$ | $-$ | $0$ | $+$ | |
| $D$ | $-3$ | ↗ | $\frac{23}{3}$ | ↘ | $-3$ | ↗ | $\frac{-2}{3}$ |

$$B(0) = 0 - 0 + 0 - 3 = -3$$

$$B(2) = \frac{1}{3} \times 2^3 - 4 \times 2^2 + 12 \times 2 - 3$$

$$= \frac{23}{3}$$

3) Le bénéfice max est $\frac{23}{3} \simeq 7{,}67$ euros.

4) Non, car par exemple $B(6) = -3 < 0$.

5) $y = B'(1)(x-1) + B(1)$

$$B'(1) = 1^2 - 8 \times 1 + 12 = 5$$

$$D(1) = \frac{1}{3} \times 1^3 - 4 \times 1^2 + 12 \times 1 - 3$$

$$= \frac{1}{3} - 4 + 12 - 3$$

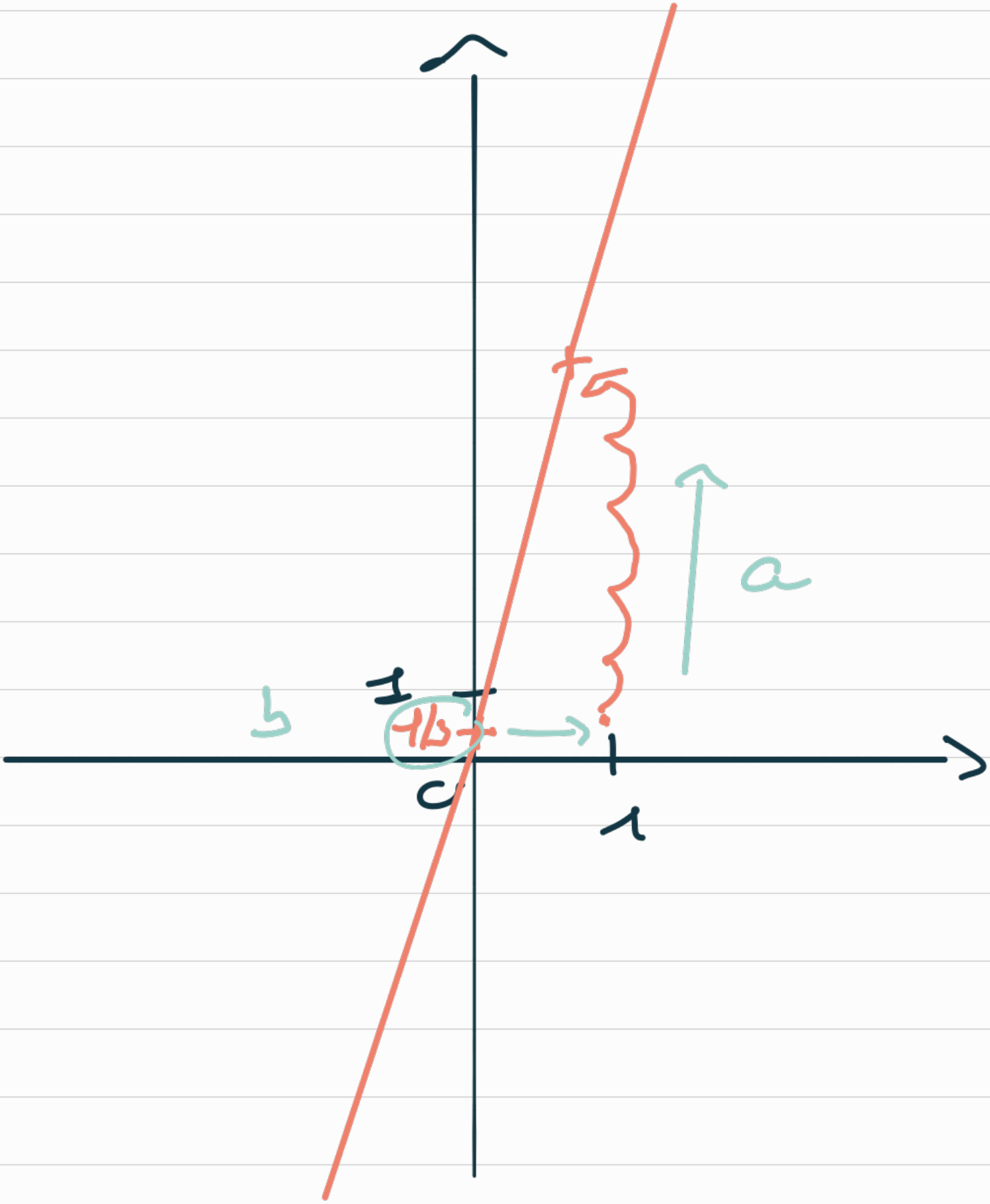
$$= \frac{1}{3} + 5$$

$$= \frac{1 + 15}{3} = \frac{16}{3}$$

$$\Rightarrow y = 5(x-1) + \frac{16}{3}$$

$$= 5x - 5 + \frac{16}{3}$$

$$= 5x + \frac{1}{3}$$


a
b
1
1
c