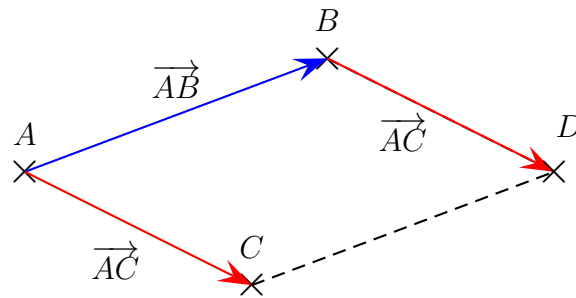


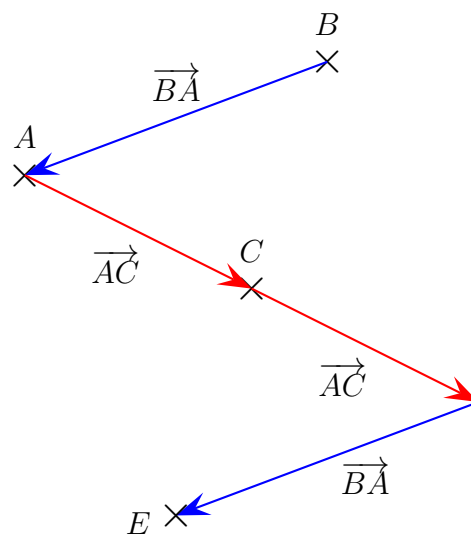
# Corrigé du devoir de mathématiques

## Exercice 1

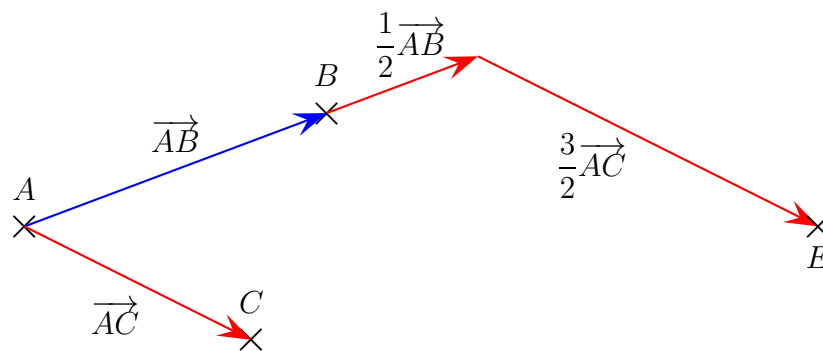
a)  $\overrightarrow{AD} = \overrightarrow{AB} + \overrightarrow{AC}$



b)  $\overrightarrow{CE} = \overrightarrow{AC} - \overrightarrow{AB} = \overrightarrow{AC} + \overrightarrow{BA}$



c)  $\overrightarrow{BF} = \frac{1}{2}\overrightarrow{AB} - \frac{3}{2}\overrightarrow{CA} = \frac{1}{2}\overrightarrow{AB} + \frac{3}{2}\overrightarrow{AC}$



**Exercice 2**

$$\begin{aligned}
 (E_1) : (2x+1)(x+3) &= (x+3) \iff (2x+1)(x+3) - (x+3) = 0 \\
 &\iff (x+3)((2x+1) - 1) = 0 \iff (2x+1)(2x) = 0 \\
 &\iff \begin{cases} 2x+1 = 0 \\ \text{ou, } 2x = 0 \end{cases} \iff \begin{cases} x = -\frac{1}{2} \\ \text{ou, } x = 0 \end{cases} \quad \underline{\mathcal{S}_1 = \left\{ -\frac{1}{2}; 0 \right\}}
 \end{aligned}$$

$$\begin{aligned}
 (E_2) : \sqrt{2x+1} = 6 \geq 0 &\iff \begin{cases} 2x+1 = 6^2 = 36 \\ \text{et, } 2x+6 \geq 0 \end{cases} \iff \begin{cases} x = \frac{35}{2} \\ \text{et, } 2 \times \frac{35}{2} + 1 = 36 \geq 0 \end{cases} \\
 &\quad \underline{\mathcal{S}_2 = \left\{ \frac{35}{2} \right\}}
 \end{aligned}$$

$$(E_3) : (2x+1)^2 = -9 < 0 \text{ et donc cette équation n'a aucune solution} \quad \underline{\mathcal{S}_3 = \emptyset}$$

$$\begin{aligned}
 (E_4) : \frac{x}{2x+1} = \frac{2x}{4x-1} &\iff \frac{-3x}{(2x+1)(4x-1)} = 0 \iff \begin{cases} -3x = 0 \\ \text{et, } (2x+1)(4x-1) \neq 0 \end{cases} \\
 &\iff \begin{cases} x = 0 \\ \text{et, } (2x+1)(4x-1) = -1 \neq 0 \end{cases} \quad \underline{\mathcal{S}_4 = \{0\}}
 \end{aligned}$$

$$(E_5) : (3x-1)^2 = 4 \geq 0 \iff \begin{cases} \text{ou, } 3x-1 = \sqrt{4} = 2 \\ \text{ou, } 3x-1 = -\sqrt{4} = -2 \end{cases} \iff \begin{cases} x = 1 \\ \text{ou, } x = -\frac{1}{3} \end{cases} \quad \underline{\mathcal{S}_5 = \left\{ 1; -\frac{1}{3} \right\}}$$

$$\begin{aligned}
 (E_6) : (2x-6)\sqrt{x-5} = 0 &\iff \begin{cases} \text{ou, } 2x-6 = 0 \\ \text{ou, } \sqrt{x-5} = 0 \end{cases} \iff \begin{cases} x = -3 \\ \text{ou, } x-5 = 0 \text{ et } x-5 \geq 0 \end{cases} \\
 &\iff \begin{cases} x = -3 \\ \text{ou, } x = 5 \text{ et } x-5 \geq 0 \end{cases}
 \end{aligned}$$

Or, pour  $x = 3$ , on a  $x - 5 = -2 < 0$  et  $x = 3$  n'est donc pas solution.  $\underline{\mathcal{S}_6 = \{5\}}$

$$\begin{aligned}
 (E_7) : \frac{x}{2x+1} = 1 &\iff \frac{x}{2x+1} - 1 = 0 \iff \frac{x}{2x+1} - \frac{2x+1}{2x+1} = 0 \\
 &\iff \frac{-x-1}{2x+1} = 0 \iff \begin{cases} -x-1 = 0 \\ \text{et, } 2x+1 \neq 0 \end{cases} \iff \begin{cases} x = -1 \\ \text{et, } x \neq -\frac{1}{2} \end{cases} \quad \underline{\mathcal{S}_7 = \{-1\}}.
 \end{aligned}$$

$$\begin{aligned}
 (E_7) : \frac{6x(x+1)}{x-4} = 30 + \frac{120}{x-4} &\iff \frac{6x(x+1)}{x-4} - \frac{30(x-4)}{x-4} - \frac{120}{x-4} = 0 \\
 &\iff \frac{6x^2 + 6x - 30x + 120 - 120}{x-4} = 0 \iff \frac{6x^2 - 24x}{x-4} = 0
 \end{aligned}$$

On peut, et doit, factoriser le numérateur :  $(E_8) \iff \frac{6x(x-4)}{x-4} = 0$

C'est une équation quotient, et donc,  $\begin{cases} 6x(x-4) = 0 \\ \text{et, } x-4 \neq 0 \end{cases} \iff \begin{cases} 6x = 0 \text{ ou, } x-4 = 0 \\ \text{et, } x-4 \neq 0 \end{cases} \quad \underline{\mathcal{S}_8 = \{0\}}.$

$$\begin{aligned}
 (E_8) : x^2(3x+7) = 9(3x+7) &\iff x^2(3x+7) - 9(3x+7) = 0 \iff (x^2-9)(3x+7) = 0 \\
 &\iff \begin{cases} x^2-9 = 0 \\ \text{ou, } 3x+7 = 0 \end{cases} \iff \begin{cases} x^2 = 9 \\ \text{ou, } x = -\frac{7}{3} \end{cases} \iff \begin{cases} x = -\sqrt{9} = 3 \text{ ou, } x = \sqrt{9} = 3 \\ \text{ou, } x = -\frac{7}{3} \end{cases} \\
 &\quad \underline{\mathcal{S}_8 = \left\{ -\frac{7}{3}; -3; 3 \right\}}
 \end{aligned}$$