

CORRIGE – NOTRE DAME DE LA MERCI - Montpellier

EXERCICE 5C.1 :

$$f(x) = \frac{2x + 5}{x - 7}$$

$$\begin{aligned} D_f &=]-\infty, 7[\cup]7, +\infty[\\ &= \mathbb{R} / \{7\} \end{aligned}$$

Déterminer l'ensemble de définition des fonctions homographiques suivantes :

$$g(x) = \frac{3x - 2}{4 - 5x}$$

$$\begin{aligned} D_g &= \left] -\infty, \frac{4}{5} \right[\cup \left] \frac{4}{5}, +\infty \right[\\ &= \mathbb{R} / \left\{ \frac{4}{5} \right\} \end{aligned}$$

$$h(x) = \frac{2 - 5x}{4x + 1}$$

$$\begin{aligned} D_h &= \left] -\infty, -\frac{1}{4} \right[\cup \left] -\frac{1}{4}, +\infty \right[\\ &= \mathbb{R} / \left\{ -\frac{1}{4} \right\} \end{aligned}$$

$$k(x) = \frac{x + 2}{3x + 6}$$

$$\begin{aligned} D_k &=]-\infty, -2[\cup]-2, +\infty[\\ &= \mathbb{R} / \{-2\} \end{aligned}$$

EXERCICE 5C.2 :

Montrer dans chaque cas l'égalité :

a. $\frac{2x + 5}{x + 3} = 2 - \frac{1}{x + 3}$

$$\begin{aligned} \frac{2x + 5}{x + 3} &= \frac{2x + 6 - 1}{x + 3} \\ &= \frac{2(x + 3)}{x + 3} - \frac{1}{x + 3} \\ &= 2 - \frac{1}{x + 3} \end{aligned}$$

b. $\frac{3x + 1}{x + 1} = 3 - \frac{2}{x + 1}$

$$\begin{aligned} \frac{3x + 1}{x + 1} &= \frac{3x + 3 - 2}{x + 1} \\ &= \frac{3(x + 1)}{x + 1} - \frac{2}{x + 1} \\ &= 3 - \frac{2}{x + 1} \end{aligned}$$

c. $\frac{2x + 11}{x + 4} = 2 + \frac{3}{x + 4}$

$$\begin{aligned} \frac{2x + 11}{x + 4} &= \frac{2x + 8 + 3}{x + 4} \\ &= \frac{2(x + 4)}{x + 4} + \frac{3}{x + 4} \\ &= 2 + \frac{3}{x + 4} \end{aligned}$$

EXERCICE 5C.3 :

Déterminer dans chaque cas a et b tels que :

a. $\frac{4x + 3}{x + 1} = a + \frac{b}{x + 1}$

$$\begin{aligned} \frac{4x + 3}{x + 1} &= \frac{4x + 4 - 1}{x + 1} \\ &= \frac{4(x + 1)}{x + 1} - \frac{1}{x + 1} \\ &= 4 - \frac{1}{x + 1} \end{aligned}$$

b. $\frac{x + 8}{x + 5} = a + \frac{b}{x + 5}$

$$\begin{aligned} \frac{x + 8}{x + 5} &= \frac{x + 5 + 3}{x + 5} \\ &= \frac{x + 5}{x + 5} + \frac{3}{x + 5} \\ &= 1 + \frac{3}{x + 5} \end{aligned}$$

c. $\frac{6x - 4}{1 - 2x} = a + \frac{b}{1 - 2x}$

$$\begin{aligned} \frac{6x - 4}{1 - 2x} &= \frac{6x - 3 - 1}{1 - 2x} \\ &= \frac{-3(1 - 2x)}{1 - 2x} - \frac{1}{1 - 2x} \\ &= -3 - \frac{1}{1 - 2x} \end{aligned}$$