

$$1) \left. \begin{array}{l} f: \mathbb{R} \rightarrow \mathbb{R} \quad g: \mathbb{R} \rightarrow \mathbb{R} \quad h: \mathbb{R} \rightarrow \mathbb{R} \\ f(x) = 2x - 3 \quad g(x) = -\frac{1}{2}x + 1 \quad h(x) = 2x + 3 \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} a) m(G_f, G_g) \\ b) m(G_f, G_h) \end{array} \right.$$

$$\text{In general: } \left. \begin{array}{l} f: \mathbb{R} \rightarrow \mathbb{R} \quad g: \mathbb{R} \rightarrow \mathbb{R} \\ f(x) = ax + b \quad g(x) = mx + n \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} G_f \parallel G_g \Leftrightarrow a = m \\ G_f \perp G_g \Leftrightarrow a \cdot m = -1 \end{array} \right.$$

$$\text{Verificação: } 2 \cdot \left(-\frac{1}{2}\right) = -2 \cdot \frac{1}{2} = -1 \Rightarrow G_f \perp G_g \Rightarrow m(G_f, G_g) = 90^\circ$$

$$\begin{array}{c|c|c} x & 0 & 1 \\ \hline f(x) & -3 & -1 \end{array} \quad \begin{array}{c|c|c} x & 0 & 2 \\ \hline g(x) & 1 & 0 \end{array}$$

$$\text{Determinar } G_f \cap G_g = \{A(m, n)\} \Rightarrow$$

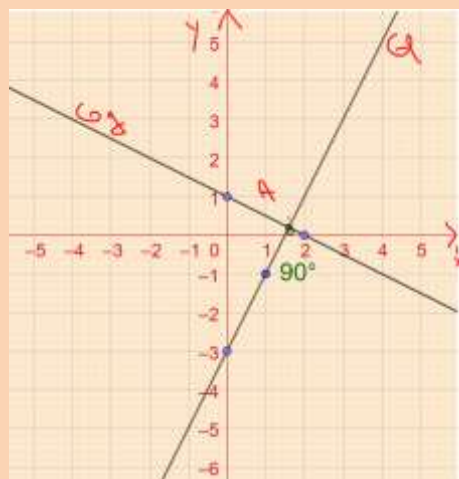
$$A(m, n) \in G_f \Rightarrow f(m) = n$$

$$A(m, n) \in G_g \Rightarrow g(m) = n \quad \left\{ \begin{array}{l} f(m) = g(m) \Rightarrow \\ 2m - 3 = -\frac{1}{2}m + 1 \end{array} \right. \cdot 2$$

$$4m - 6 = -m + 2 \Rightarrow 4m + m = 2 + 6 \Rightarrow 5m = 8 \Rightarrow m = \frac{8}{5}$$

$$n = f(m) \Rightarrow n = f\left(\frac{8}{5}\right) \Rightarrow n = 2 \cdot \frac{8}{5} - 3 = \frac{16}{5} - \frac{15}{5} = \frac{1}{5}$$

$$A\left(\frac{8}{5}, \frac{1}{5}\right)$$



$$b) \left. \begin{array}{l} f: \mathbb{R} \rightarrow \mathbb{R} \quad h: \mathbb{R} \rightarrow \mathbb{R} \\ f(x) = 2x - 3 \quad h(x) = 2x + 3 \end{array} \right\} \Rightarrow 2 = 2 \Rightarrow G_f \parallel G_h \Rightarrow m(G_f, G_h) = 0^\circ$$

$$\text{Prova: } \begin{array}{c|c|c} x & 0 & -1 \\ \hline h(x) & 3 & 1 \end{array}$$

$$\text{Se } \{A(m, n)\} = G_f \cap G_h \Rightarrow$$

$$\Rightarrow A(m, n) \in G_h \Rightarrow h(m) = n \Rightarrow 2m + 3 = n$$

$$A(m, n) \in G_f \Rightarrow f(m) = n \Rightarrow 2m - 3 = n$$

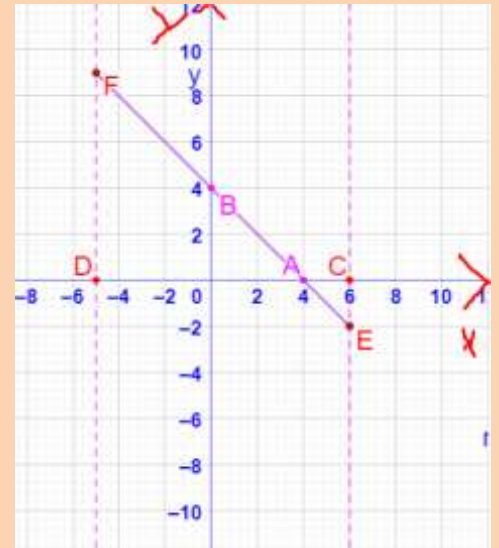
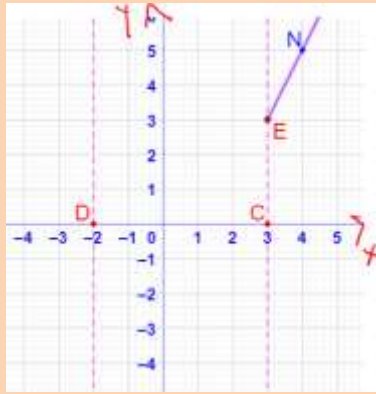
$$2m + 3 = 2m - 3 \Rightarrow 2m - 2m = -3 - 3 \Rightarrow$$

$$0 \cdot m = -6 \quad (\text{impossível})$$

$$(\nexists) A(m, n) \Rightarrow G_f \cap G_h = \emptyset \Rightarrow G_f \parallel G_h$$



2) Reprezentati grafic functie: $f: [-5, 6] \rightarrow \mathbb{R}$ $f(x) = -x + 4$ $\begin{array}{r} x \\ 4 \\ \hline 0 \end{array}$

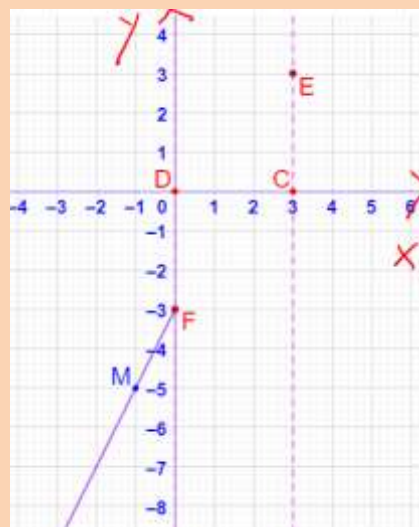


$f: [3, \infty) \rightarrow \mathbb{R}$, $f(x) = 2x - 3$

$$\begin{array}{r} x \\ 4.5 \\ \hline 1 \end{array}$$

$f: (-\infty, 0) \rightarrow \mathbb{R}$, $f(x) = 2x - 3$

$$\begin{array}{r} x \\ -1.2 \\ \hline -1 \end{array}$$



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