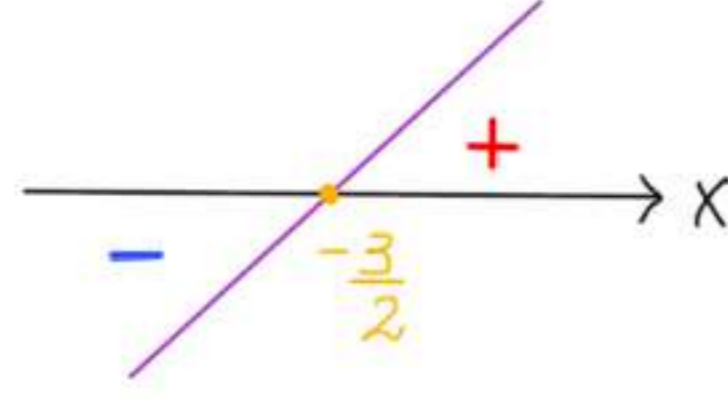


Estude os sinais das funções definidas em \mathbb{R} :

1. $y = 2x + 3$

$a \Rightarrow$ Coeficiente angular

$a > 0 \Rightarrow$ Função crescente



$$\begin{aligned} y = 0 &\Rightarrow \text{se } x = -3/2 \\ y > 0 &\Rightarrow \text{se } x > -3/2 \\ y < 0 &\Rightarrow \text{se } x < -3/2 \end{aligned}$$

Encontrando a raiz da equação:

$$\begin{aligned} 2x + 3 &= 0 \\ 2x &= -3 \\ x &= -\frac{3}{2} \end{aligned}$$

Assim:

$$f(x) = 0 \Rightarrow x = -\frac{3}{2}$$

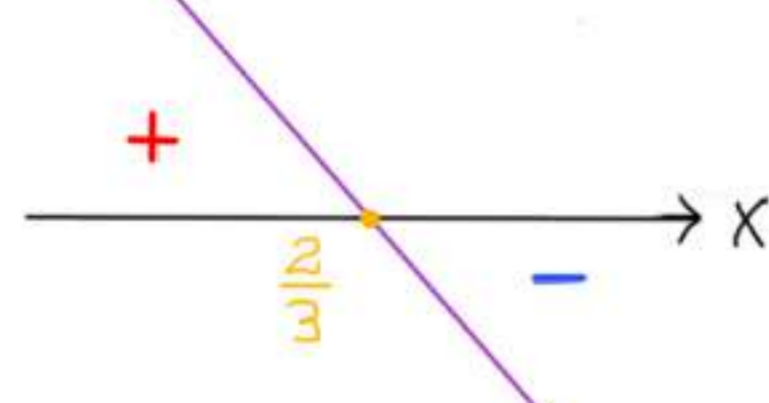
$$f(x) > 0 \Rightarrow x > -\frac{3}{2}$$

$$f(x) < 0 \Rightarrow x < -\frac{3}{2}$$

2. $y = -3x + 2$

$a \Rightarrow$ Coeficiente angular

$a < 0 \Rightarrow$ Função decrescente



$$\begin{aligned} y = 0 &\Rightarrow \text{se } x = 2/3 \\ y > 0 &\Rightarrow \text{se } x < 2/3 \\ y < 0 &\Rightarrow \text{se } x > 2/3 \end{aligned}$$

Encontrando a raiz da equação:

$$\begin{aligned} -3x + 2 &= 0 \\ -3x &= -2 \\ x &= \frac{2}{3} \end{aligned}$$

Assim:

$$f(x) = 0 \Rightarrow x = \frac{2}{3}$$

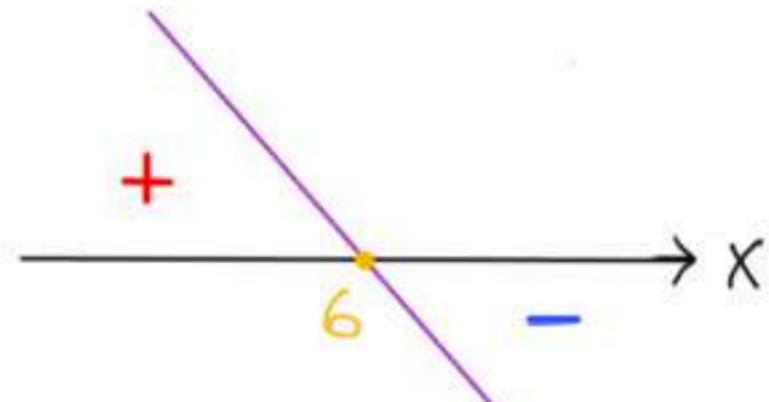
$$f(x) > 0 \Rightarrow x < \frac{2}{3}$$

$$f(x) < 0 \Rightarrow x > \frac{2}{3}$$

3. $y = 3 - \frac{x}{2}$

$a \Rightarrow$ Coeficiente angular

$a < 0 \Rightarrow$ Função decrescente



$$\begin{aligned} y = 0 &\Rightarrow \text{se } x = 6 \\ y > 0 &\Rightarrow \text{se } x < 6 \\ y < 0 &\Rightarrow \text{se } x > 6 \end{aligned}$$

Encontrando a raiz da equação:

$$\begin{aligned} 3 - \frac{x}{2} &= 0 \\ 3 &= \frac{x}{2} \\ x &= 6 \end{aligned}$$

Assim:

$$f(x) = 0 \Rightarrow x = 6$$

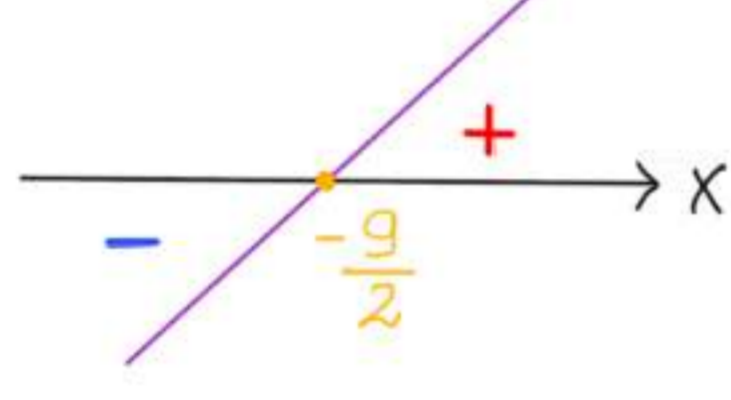
$$f(x) > 0 \Rightarrow x < 6$$

$$f(x) < 0 \Rightarrow x > 6$$

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

$a \Rightarrow$ Coeficiente angular

$a > 0 \Rightarrow$ Função crescente



$$\begin{aligned} y = 0 &\Rightarrow \text{se } x = -9/2 \\ y > 0 &\Rightarrow \text{se } x > -9/2 \\ y < 0 &\Rightarrow \text{se } x < -9/2 \end{aligned}$$

Encontrando a raiz da equação:

$$\begin{aligned} \frac{x}{3} + \frac{3}{2} &= 0 \\ \frac{x}{3} &= -\frac{3}{2} \\ x &= -\frac{9}{2} \end{aligned}$$

Assim:

$$f(x) = 0 \Rightarrow x = -\frac{9}{2}$$

$$f(x) > 0 \Rightarrow x > -\frac{9}{2}$$

$$f(x) < 0 \Rightarrow x < -\frac{9}{2}$$

5. Para que valores do domínio da função de \mathbb{R} em \mathbb{R} definida por $f(x) = \frac{3x-1}{2}$ a imagem é menor que 4?

\hookrightarrow Ou seja, para que valores de x , y será menor que 4:

$$\begin{aligned} y &< 4 \\ \frac{3x-1}{2} &< 4 \\ 3x-1 &< 8 \\ 3x &< 8+1 \\ x &< \frac{9}{3} \\ x &< 3 \end{aligned}$$

$$x < 3$$

6. Para que valores de $x \in \mathbb{R}$ a função $f(x) = \frac{2}{3} - \frac{x}{2}$ é negativa?

\hookrightarrow Ou seja, para que valores de x , y é menor que zero:

$$\begin{aligned} y &< 0 \\ \frac{2}{3} - \frac{x}{2} &< 0 \\ \text{m.m.c.} \leftarrow \frac{4-3x}{6} &< 0 \\ -3x+4 &< 0 \\ -3x &< -4 \quad \times(-1) \\ 3x &> 4 \\ x &> \frac{4}{3} \end{aligned}$$

$$x > 4/3$$

Sejam as funções $f(x) = 2x + 3, g(x) = 2 - 3x$ e $h(x) = \frac{4x-1}{2}$ definidas em \mathbb{R} . Para que valores de $x \in \mathbb{R}$, tem-se:

7. $f(x) \geq g(x)$?

$$\begin{aligned} f(x) &\geq g(x) \\ 2x+3 &\geq 2-3x \\ 2x+3x &\geq 2-3 \\ 5x &\geq -1 \\ x &\geq -\frac{1}{5} \end{aligned}$$

$$x \geq -1/5$$

8. $g(x) < h(x)$?

$$\begin{aligned} g(x) &< h(x) \\ 2-3x &< \frac{4x-1}{2} \\ 2 \cdot (2-3x) &< 4x-1 \\ 4-6x &< 4x-1 \\ -6x-4x &< -1-4 \\ -10x &< -5 \quad \times(-1) \\ 10x &> 5 \\ x &> \frac{5}{10} \\ x &> \frac{1}{2} \end{aligned}$$

$$x > 1/2$$