

Resolva, em  $\mathbb{R}$ , as inequações:

1.

$$(x^2 - x - 2) \cdot (-x^2 + 4x - 3) > 0$$

$$\frac{-1}{-1} + \frac{2}{-1} = -b/a = 1$$

$$\frac{-1}{-1} \cdot \frac{2}{-1} = c/a = -2$$

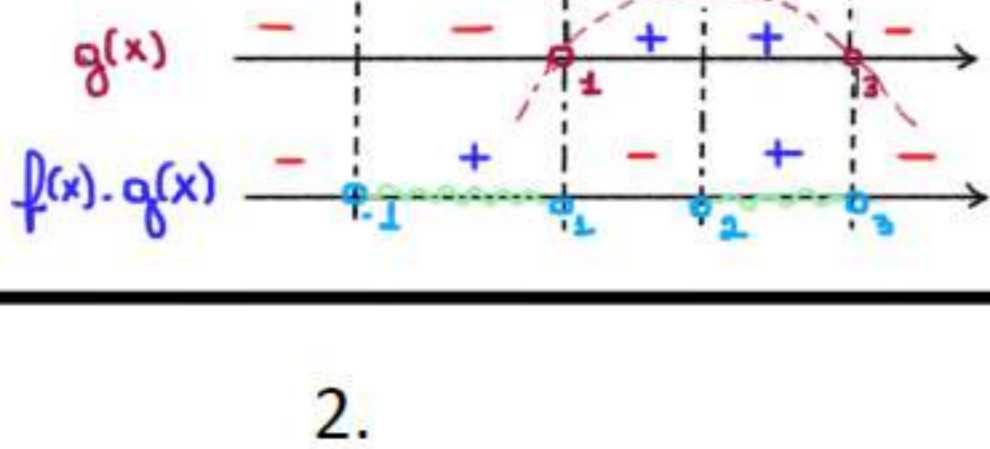
$$\Delta = b^2 - 4 \cdot a \cdot c$$

$$\Delta = 16 - 4 \cdot (-1) \cdot (-3)$$

$$\Delta = 4$$

$$x' = -1, x'' = 2$$

$$x_{1,2} = \frac{-4 \pm \sqrt{4}}{2 \cdot (-1)} \rightarrow x_1 = 1, x_2 = 3$$



$$S = \{x \in \mathbb{R} / -1 < x < 1 \text{ ou } 2 < x < 3\}$$

2.

$$(1 - 4x^2) \cdot (2x^2 + 3x) > 0$$

$$1 - 4x^2 = 0$$

$$2x^2 + 3x = 0$$

$$-4x^2 = -1 \cdot (-1)$$

$$x(2x + 3) = 0$$

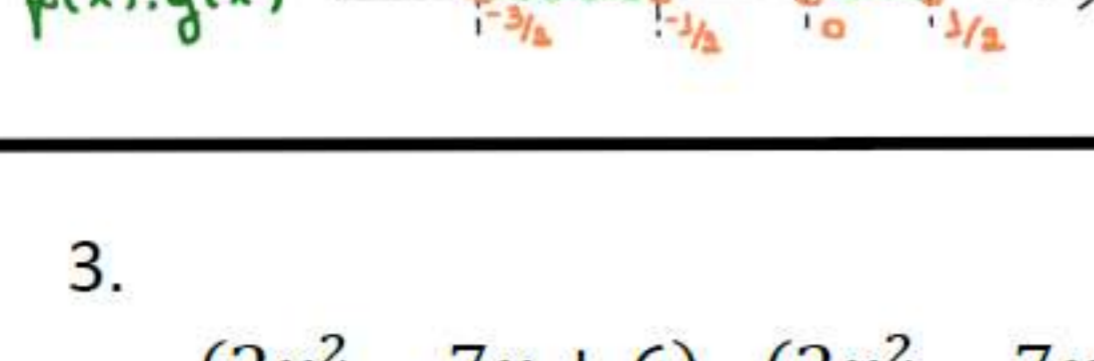
$$x^2 = \frac{1}{4} \quad x = \sqrt{\frac{1}{4}}$$

$$x_1 = 0$$

$$x_{1,2} = \pm \frac{1}{2}$$

$$2x + 3 = 0$$

$$2x = -3 \quad x_2 = -3/2$$



$$S = \{x \in \mathbb{R} / -3/2 < x < -1/2 \text{ ou } 0 < x < 1/2\}$$

3.

$$(2x^2 - 7x + 6) \cdot (2x^2 - 7x + 5) \leq 0$$

$$\Delta = (-7)^2 - 4 \cdot 2 \cdot 6$$

$$\Delta = (-7)^2 - 4 \cdot 2 \cdot 5$$

$$\Delta = 1$$

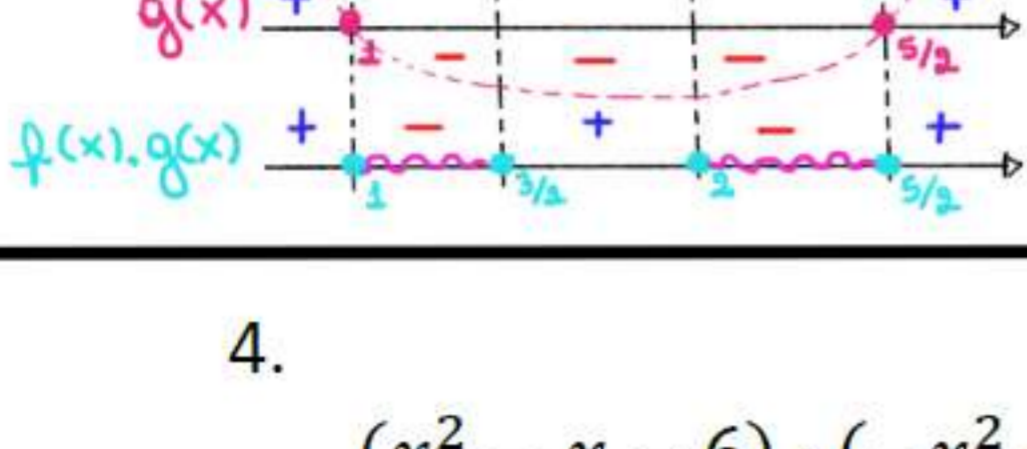
$$\Delta = 9$$

$$x_{1,2} = \frac{-(-7) \pm \sqrt{1}}{2 \cdot 2}$$

$$x_{1,2} = \frac{-(-7) \pm \sqrt{9}}{2 \cdot 2}$$

$$x_1 = 3/2, x_2 = 2$$

$$x_1 = 5/2, x_2 = 1$$



$$S = \{x \in \mathbb{R} / 1 \leq x \leq 3/2 \text{ ou } 2 \leq x \leq 5/2\}$$

4.

$$(x^2 - x - 6) \cdot (-x^2 + 2x - 1) > 0$$

$$\Delta = (-1)^2 - 4 \cdot 1 \cdot (-6)$$

$$\Delta = 2^2 - 4 \cdot (-1) \cdot (-1)$$

$$\Delta = 25$$

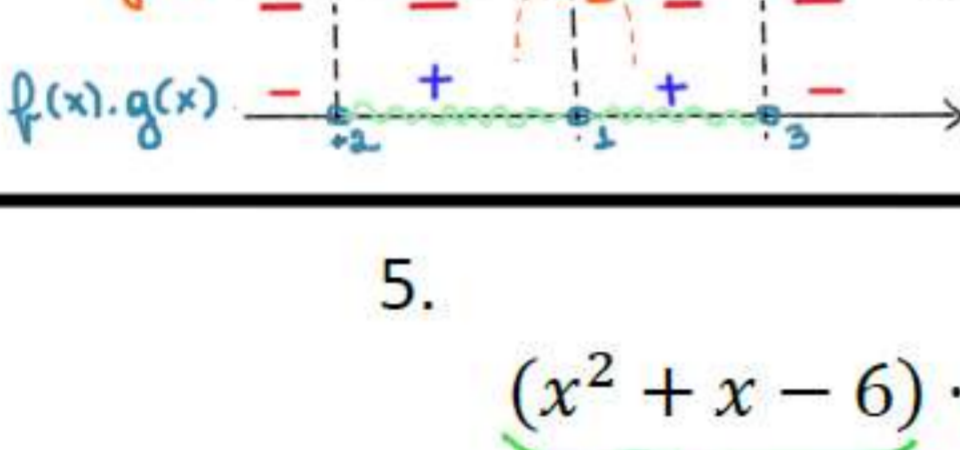
$$\Delta = 0$$

$$x_{1,2} = \frac{-(-1) \pm \sqrt{25}}{2 \cdot 1}$$

$$x_1 = x_2 = \frac{-2 \pm 0}{2 \cdot (-1)}$$

$$x_1 = -2, x_2 = 3$$

$$x_1 = x_2 = 1$$



$$S = \{x \in \mathbb{R} / -2 < x < 3 \text{ e } x \neq 1\}$$

5.

$$(x^2 + x - 6) \cdot (-x^2 - 2x + 3) \geq 0$$

$$\Delta = (1)^2 - 4 \cdot 1 \cdot (-6)$$

$$\Delta = (-2)^2 - 4 \cdot 3 \cdot (-1)$$

$$\Delta = 25$$

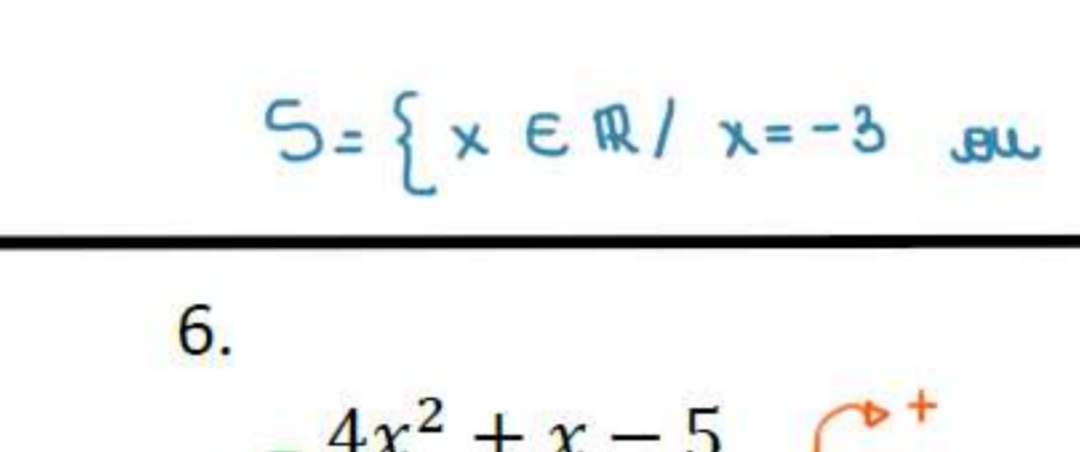
$$\Delta = 16$$

$$x_{1,2} = \frac{-1 \pm \sqrt{25}}{2 \cdot 1}$$

$$x_{1,2} = \frac{-(-2) \pm \sqrt{16}}{2 \cdot (-1)}$$

$$x_1 = -3, x_2 = 2$$

$$x_1 = -3, x_2 = 1$$



$$S = \{x \in \mathbb{R} / x = -3 \text{ ou } 1 \leq x \leq 2\}$$

6.

$$\frac{4x^2 + x - 5}{2x^2 - 3x - 2} > 0$$

$$\Delta = 1^2 - 4 \cdot 4 \cdot (-5)$$

$$\Delta = (-3)^2 - 4 \cdot 2 \cdot (-3)$$

$$\Delta = 81$$

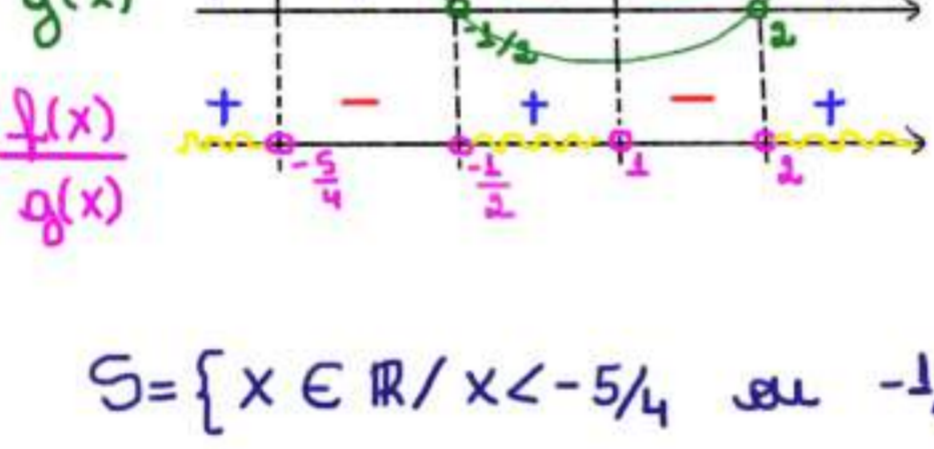
$$\Delta = 25$$

$$x_{1,2} = \frac{-1 \pm \sqrt{81}}{2 \cdot 4}$$

$$x_{1,2} = \frac{-(-3) \pm \sqrt{25}}{2 \cdot 2}$$

$$x_1 = -5/4, x_2 = 1$$

$$x_1 = -1/2, x_2 = 2$$



$$S = \{x \in \mathbb{R} / x < -5/4 \text{ ou } -1/2 < x < 1 \text{ ou } x > 2\}$$

7.

$$\frac{-9x^2 + 9x - 2}{3x^2 + 7x + 2} \leq 0$$

$$\Delta = (9)^2 - 4 \cdot 9 \cdot (-2)$$

$$\Delta = (7)^2 - 4 \cdot 2 \cdot 3$$

$$\Delta = 9$$

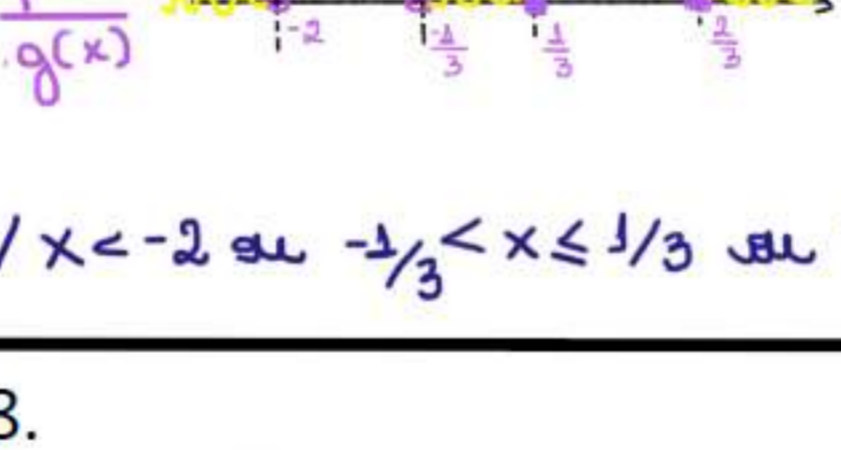
$$\Delta = 25$$

$$x_{1,2} = \frac{-9 \pm \sqrt{9}}{2 \cdot (-9)}$$

$$x_{1,2} = \frac{-7 \pm \sqrt{25}}{2 \cdot 3}$$

$$x_1 = 1/3, x_2 = 2/3$$

$$x_1 = -1/3, x_2 = -2$$



$$S = \{x \in \mathbb{R} / x < -2 \text{ ou } -1/3 < x \leq 1/3 \text{ ou } x \geq 2/3\}$$

8.

$$\frac{x^2 + 2x}{x^2 + 5x + 6} \geq 0$$

$$\Delta = 2^2 - 4 \cdot 1 \cdot 0$$

$$\Delta = 5^2 - 4 \cdot 1 \cdot 6$$

$$\Delta = 4$$

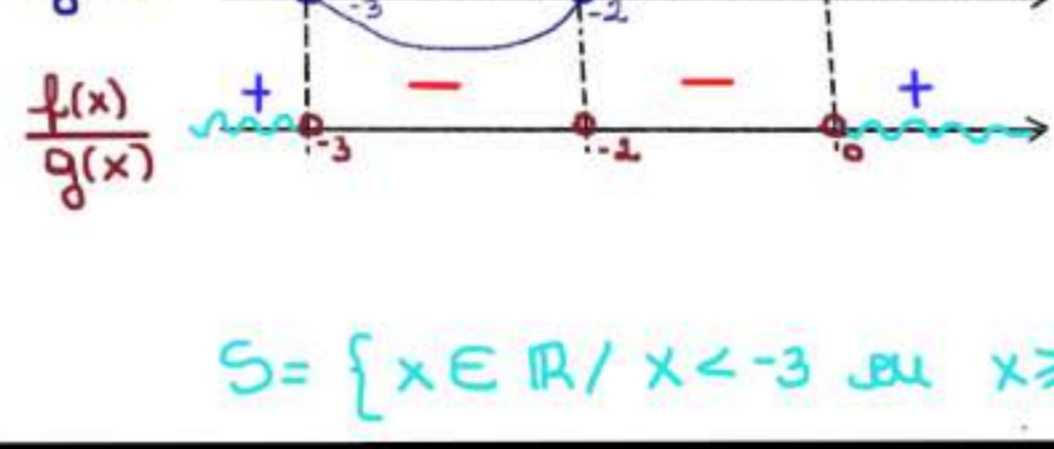
$$\Delta = 1$$

$$x_{1,2} = \frac{-2 \pm \sqrt{4}}{2 \cdot 1}$$

$$x_{1,2} = \frac{-5 \pm \sqrt{1}}{2 \cdot 1}$$

$$x_1 = -2, x_2 = 0$$

$$x_1 = -3, x_2 = -2$$



$$S = \{x \in \mathbb{R} / x < -3 \text{ ou } x \geq 0\}$$

9.

$$\frac{2 - 3x}{2x^2 + 3x - 2} < 0$$

Nota

$$\Delta = 3^2 - 4 \cdot 2 \cdot (-2)$$

$$2 - 3x = 0$$

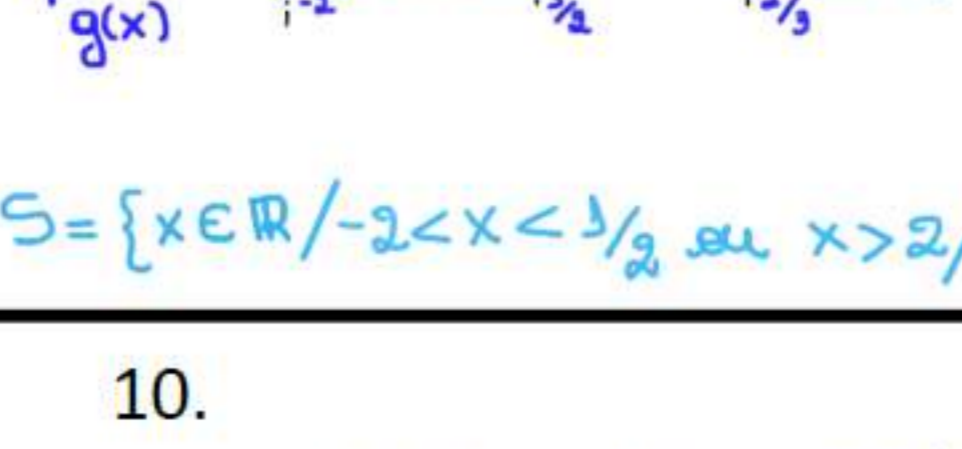
$$\Delta = 25$$

$$-3x = -2 \cdot (-1)$$

$$x_{1,2} = \frac{-3 \pm \sqrt{25}}{2 \cdot 2}$$

$$x = \frac{2}{3}$$

$$x_1 = -2, x_2 = 1/2$$



$$S = \{x \in \mathbb{R} / -2 < x < 1/2 \text{ ou } x > 2/3\}$$

10.

$$\frac{x^2 + 3x - 16}{-x^2 + 7x - 10} \geq 1$$

$$\frac{x^2 + 3x - 16}{-x^2 + 7x - 10} - 1 \geq 0$$

$$\frac{x^2 + 3x - 16 + x^2 - 7x + 10}{-x^2 + 7x - 10}$$

$$\frac{2x^2 - 4x - 6}{-x^2 + 7x - 10} \geq 0$$

$$\Delta = (-4)^2 - 4 \cdot 2 \cdot (-6)$$

$$\Delta = 7^2 - 4 \cdot (-1) \cdot (-10)$$

$$\Delta = 64$$

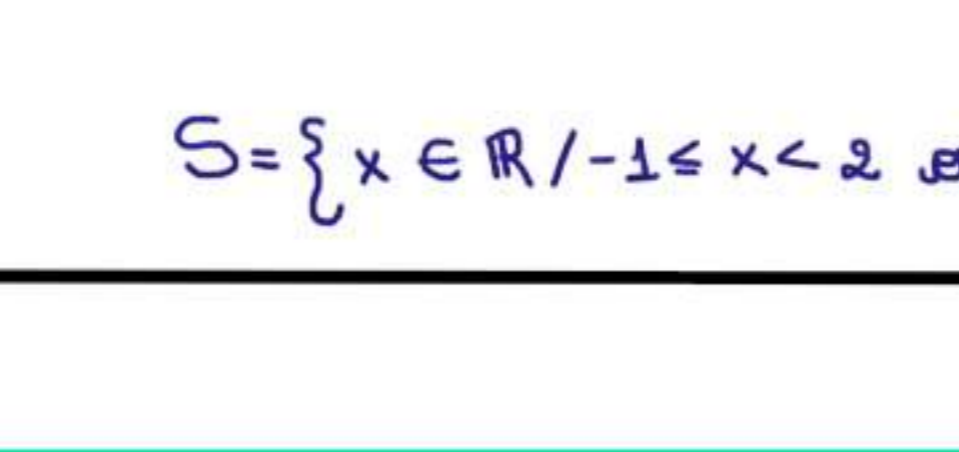
$$\Delta = 9$$

$$x_{1,2} = \frac{-(-4) \pm \sqrt{64}}{2 \cdot 2}$$

$$x_{1,2} = \frac{-7 \pm \sqrt{9}}{2 \cdot (-1)}$$

$$x_1 = -1, x_2 = 3$$

$$x_1 = 2, x_2 = 5$$



$$S = \{x \in \mathbb{R} / -1 \leq x < 2 \text{ ou } 3 \leq x < 5\}$$