

Ex1 Résoudre

$$\begin{aligned} \textcircled{1} \quad & -9x - 4 < -3x + 1 \\ & -9x + 3x < 1 + 4 \\ & -6x < 5 \\ & x > -\frac{5}{6} \end{aligned} \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} : (-6) \ominus$$

$$S =] -\frac{5}{6}; +\infty[$$

$$\begin{aligned} \textcircled{2} \quad & \frac{7-x}{3} \leq -2 \\ & 7-x \leq -6 \\ & -x \leq -13 \\ & x \geq -\frac{13}{-1} \\ & x \geq 13 \end{aligned} \quad \left. \begin{array}{l} \\ \\ \\ \end{array} \right\} \begin{array}{l} \times 3 \oplus \\ \\ \\ : (-1) \ominus \end{array}$$

$$S = [13; +\infty[$$

Ex2

$$\begin{aligned} 1) \quad & \text{Si } x > 9 \quad \left. \begin{array}{l} \text{sur }]0; +\infty[\quad x \mapsto \sqrt{x} \nearrow \\ \sqrt{x} > \sqrt{9} \\ 3\sqrt{x} > 9 \end{array} \right\} \begin{array}{l} \\ \\ \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \times 3 \oplus \end{aligned}$$

$$3\sqrt{x} - 1 > 8$$

$$\begin{aligned} 2) \quad & \text{Si } x < -5 \quad \left. \begin{array}{l} -2x > 10 \\ 1-2x > 11 \end{array} \right\} \times (-2) \ominus \\ & \quad \quad \quad \left. \begin{array}{l} \text{sur }]0; +\infty[\quad x \mapsto \frac{1}{x} \searrow \\ \frac{1}{1-2x} < \frac{1}{11} \end{array} \right\} \begin{array}{l} \\ \\ \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \times 4 \oplus \end{aligned}$$

$$\frac{4}{1-2x} < \frac{4}{11}$$

$$\begin{aligned} 3) \quad & \text{Si } x < -2 \quad \left. \begin{array}{l} -3x > 6 \\ -3x + 1 > 7 \end{array} \right\} \times (-3) \ominus \\ & \quad \quad \quad \left. \begin{array}{l} \text{sur }]0; +\infty[\quad x \mapsto x^2 \nearrow \\ (-3x+1)^2 > 49 \end{array} \right\} \begin{array}{l} \\ \\ \end{array} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & \frac{x-3}{4} \leq \frac{5}{3} \\ & x-3 \leq \frac{20}{3} \\ & 3x-9 \leq 20 \\ & 3x \leq 29 \\ & x \leq \frac{29}{3} \end{aligned} \quad \left. \begin{array}{l} \\ \\ \\ \\ \end{array} \right\} \begin{array}{l} \times 4 \oplus \\ \times 3 \oplus \\ \\ \\ : 3 \oplus \end{array}$$

$$S =] -\infty; \frac{29}{3}]$$

Ex3 Sur \mathbb{R} $f(x) = -5x + 2$ $g(x) = \frac{2x}{3} - 1$

1) $g(x) = ax + b$ avec $a = \frac{2}{3}$ et $b = -1$
 g est affine avec $a > 0$ donc g est croissante sur \mathbb{R} .

2a) Résoudre $f(x) \leq g(x)$

$$\begin{aligned} -5x + 2 &\leq \frac{2x}{3} - 1 \\ -5x - \frac{2x}{3} &\leq -1 - 2 \\ -\frac{15x}{3} - \frac{2x}{3} &\leq -3 \end{aligned}$$

$$-\frac{17x}{3} \leq -3 \quad \left. \begin{array}{l} \\ \end{array} \right\} \times 3 \oplus$$

$$-17x \leq -9 \quad \left. \begin{array}{l} \\ \end{array} \right\} : (-17) \ominus$$

$$x \geq \frac{-9}{-17}$$

$$x \geq \frac{9}{17}$$

$$S = \left[\frac{9}{17}; +\infty[$$

b) Sur $\left[\frac{9}{17}; +\infty[$ f est en-dessous de g