

Solving linear and quadratic inequalities

[CONTENTS](#)

Worked example

Solve:

$$-8 < 2x - 1 \leq 2$$

$$-12 \leq 3x + 2 < -3$$

Your turn

Solve:

$$-4 < 4x - 3 < 20$$

$$-\frac{1}{4} < x < \frac{23}{4}$$

Worked example

Solve:

$$-8 < \frac{x-1}{2} \leq 2$$

$$-12 \leq \frac{x+2}{3} < -3$$

Your turn

Solve:

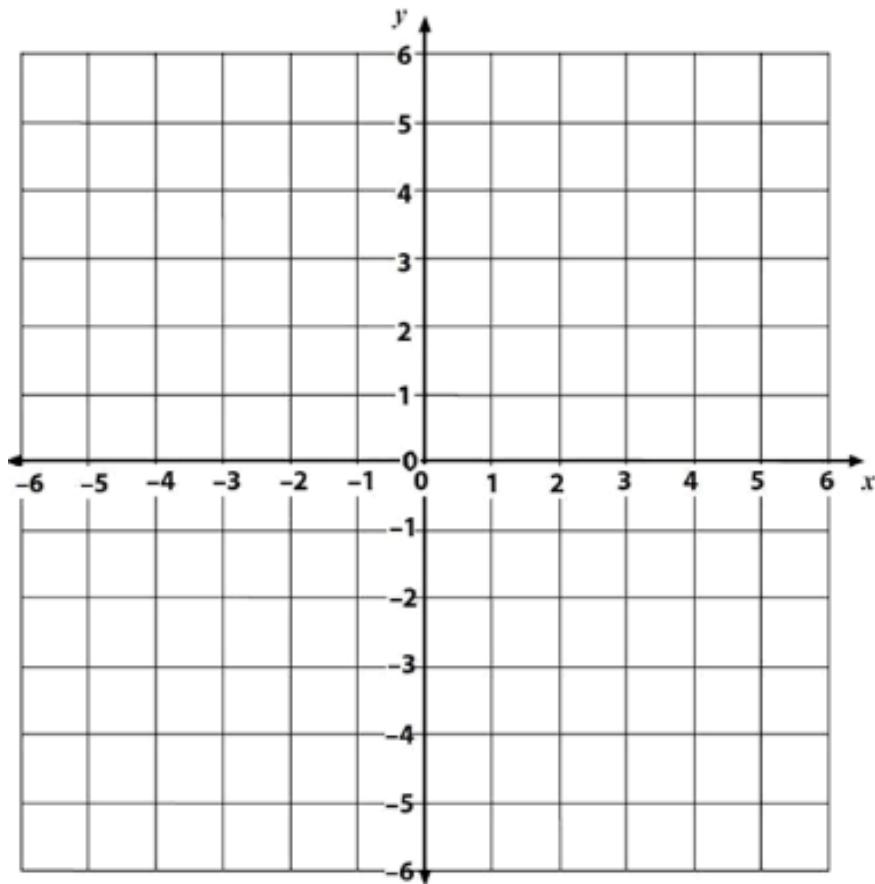
$$-4 < \frac{x-3}{4} < 20$$

$$-13 < x < 83$$

Worked example

Shade the region which satisfies the inequalities:

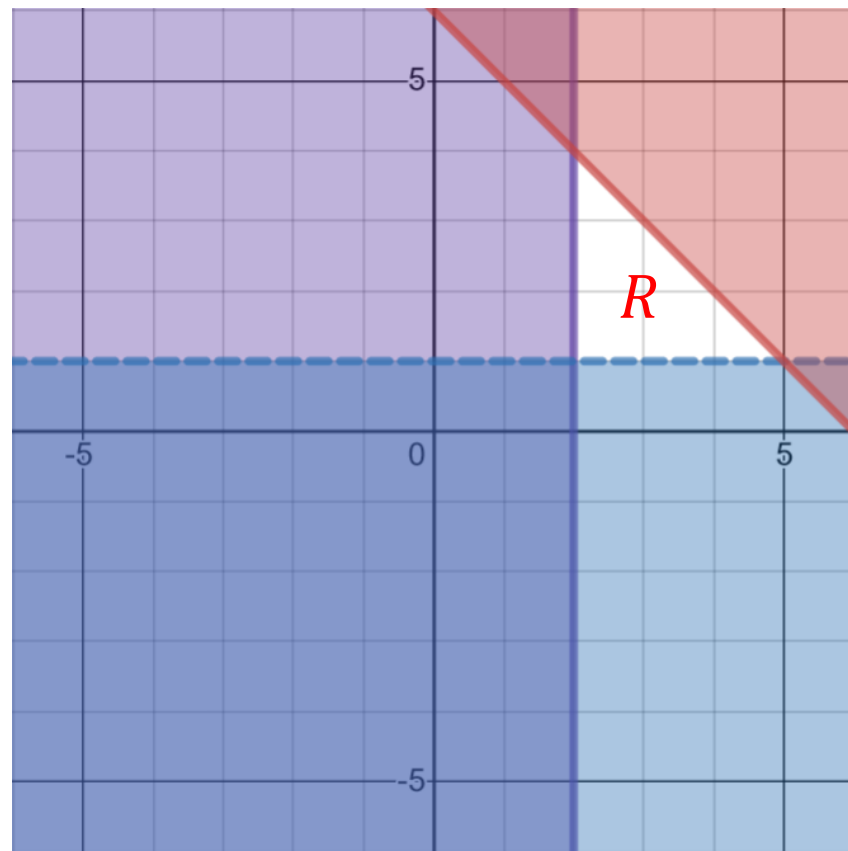
$$x \geq 2, y > -1 \text{ and } x + y \leq 5$$



Your turn

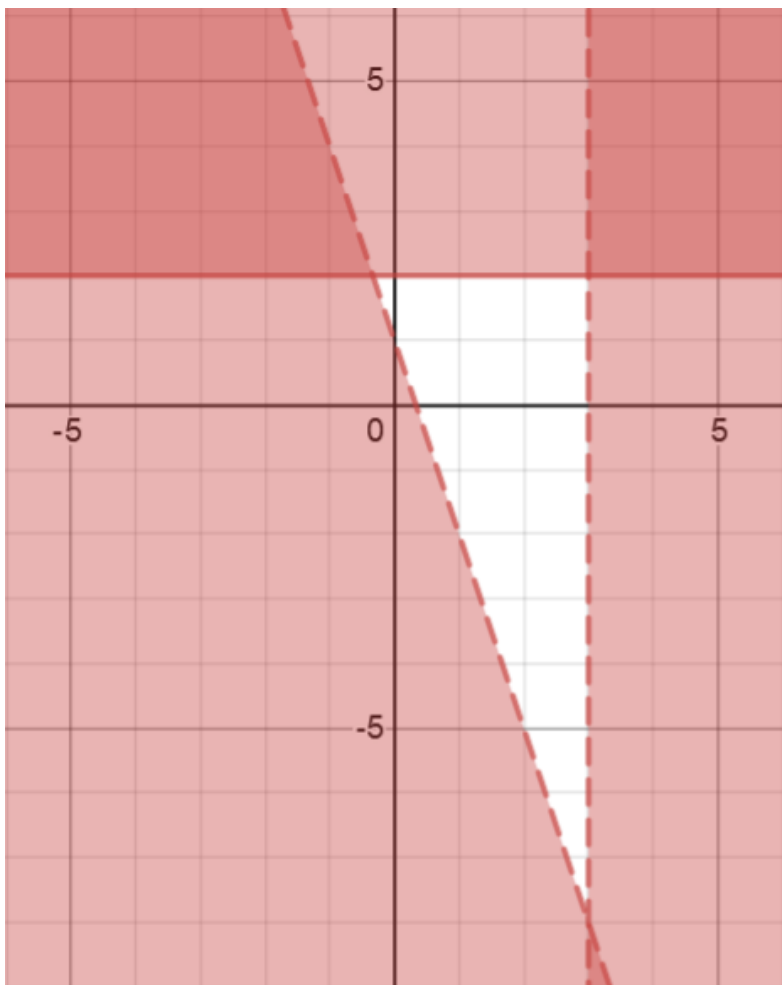
Shade the region which satisfies the inequalities. Label it R.

$$x \geq 2, y > 1 \text{ and } x + y \leq 6$$



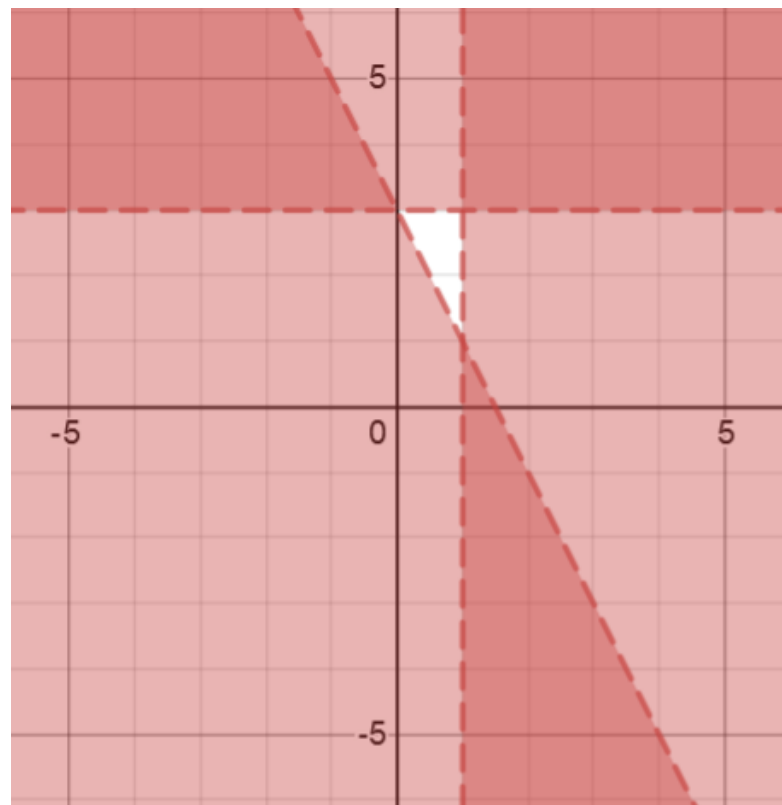
Worked example

Write the inequalities that define the unshaded region:



Your turn

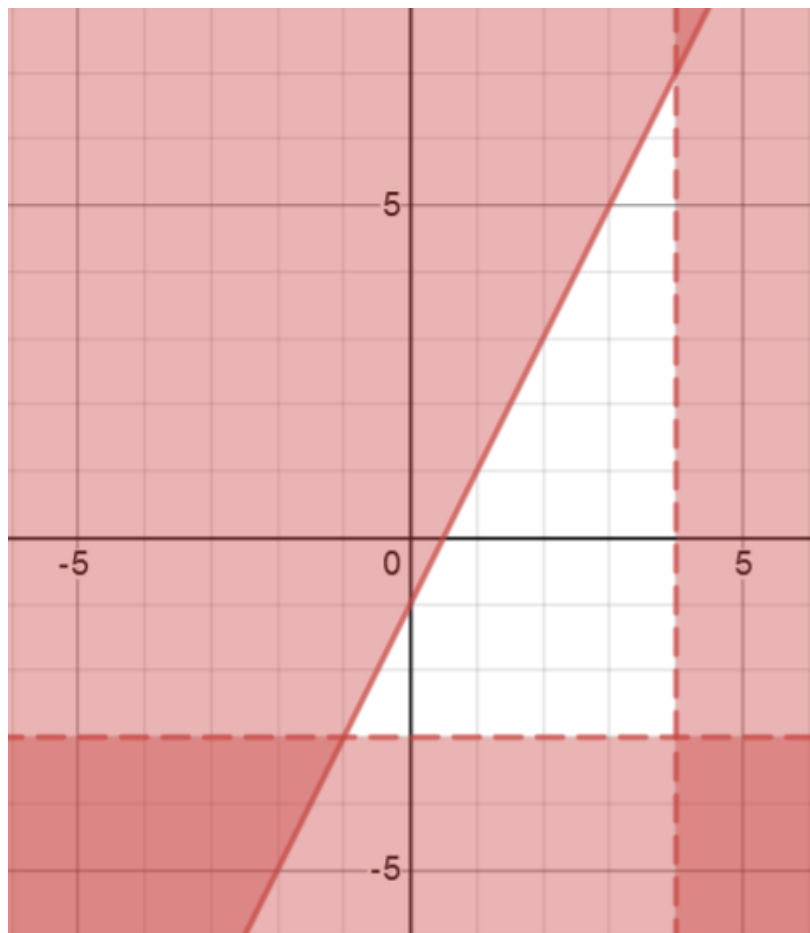
Write the inequalities that define the unshaded region:



$$\begin{aligned}x &< 1 \\y &< 3 \\y &> -2x + 3\end{aligned}$$

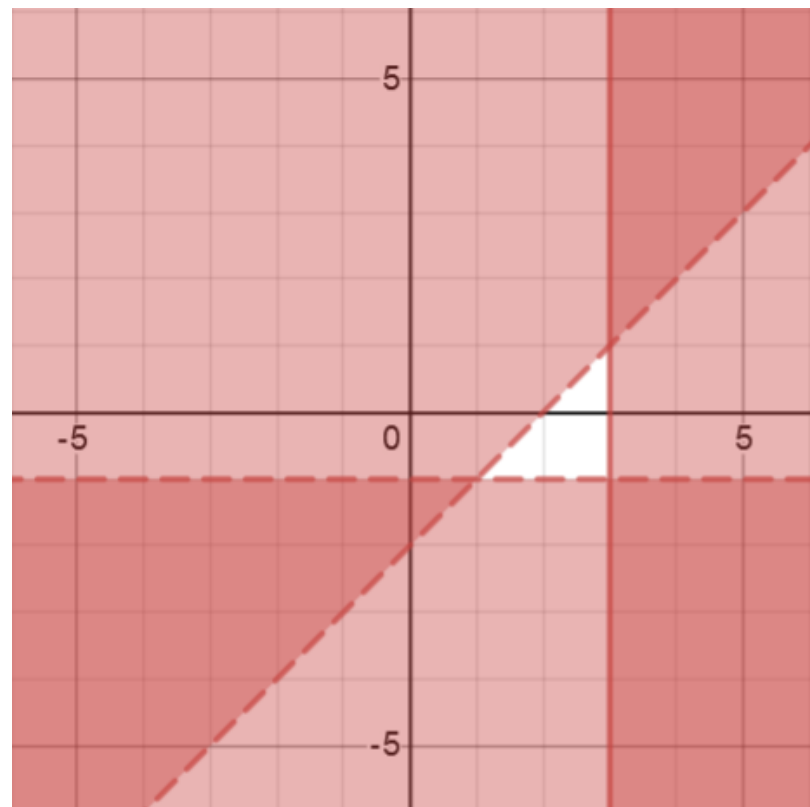
Worked example

Write the inequalities that define the unshaded region:



Your turn

Write the inequalities that define the unshaded region:



$$\begin{aligned}x &\leq 3 \\ y &> -1 \\ y &< x - 2\end{aligned}$$

Worked example

Solve:

$$x^2 - 5x + 6 = 0$$

$$x^2 - 5x + 6 < 0$$

$$x^2 - 5x + 6 \leq 0$$

Your turn

Solve:

$$x^2 - 4x + 3 < 0$$

$$1 < x < 3$$

Worked example

Solve:

$$x^2 - 5x + 6 = 0$$

$$x^2 - 5x + 6 > 0$$

$$x^2 - 5x + 6 \geq 0$$

Your turn

Solve:

$$x^2 - 4x + 3 > 0$$

$$x < 1 \cup x > 3$$

Worked example

Solve:

$$2x^2 - 7x + 3 \leq 0$$

$$2x^2 - 3x - 5 < 0$$

Your turn

Solve:

$$2x^2 - 7x + 6 \leq 0$$

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

Worked example

Solve:

$$2x^2 + x - 6 \geq 0$$

$$2x^2 + x - 6 > 0$$

Your turn

Solve:

$$3x^2 + x - 2 \geq 0$$

$$x \leq -1 \cup x \geq \frac{2}{3}$$

Worked example

Solve:

$$x^2 + 5x + 23 \leq -3x + 8$$

$$x^2 - 14x + 57 > 2x - 3$$

Your turn

Solve:

$$x^2 + 7x + 38 < -7x - 2$$

$$-10 < x < -4$$

Worked example

Solve:

$$x^2 > 25$$

$$2x^2 \geq 2$$

Your turn

Solve:

$$x^2 > 36$$

$$x < -6 \cup x > 6$$

Worked example

Solve:

$$44 < 5x^2 - 1 < 79$$

Your turn

Solve:

$$76 < 3x^2 + 1 < 148$$

$$-7 < x < -5 \cup 5 < x < 7$$