



# Quadratic Inequalities



REVISE THIS  
TOPIC

1 Solve  $x^2 + 7x + 10 < 0$  [2 marks]

$$(x+2)(x+5) < 0 \quad \text{C.V. } x = -2$$
$$x = -5$$

Answer  $-5 < x < -2$

2 Solve  $x^2 - 9x + 20 > 0$  [2 marks]

$$(x-5)(x-4) > 0 \quad \text{C.V. } x = 5$$
$$x = 4$$

Answer  $x < 4 \text{ or } x > 5$

3 Solve  $x^2 + 2x - 15 < 0$  [2 marks]

$$(x+5)(x-3) < 0 \quad \text{C.V. } x = -5$$
$$x = 3$$

Answer  $-5 < x < 3$



4 Solve  $x^2 + x - 12 > 0$

[2 marks]

$$(x+4)(x-3) > 0 \quad \text{C.V. } x = -4$$
$$x = 3$$

Answer  $x < -4$  or  $x > 3$

5 Solve  $x^2 - 2x - 24 \leq 0$

[2 marks]

$$(x-6)(x+4) \leq 0 \quad \text{C.V. } x = 6$$
$$x = -4$$

Answer  $-4 \leq x \leq 6$

6 Solve  $x^2 - 17x + 30 \geq 0$

[2 marks]

$$(x-2)(x-15) \geq 0 \quad \text{C.V. } x = 2$$
$$x = 15$$

Answer  $x \leq 2$  or  $x \geq 15$

7 Solve  $x^2 - 25 \leq 0$

[2 marks]

$$(x+5)(x-5) \leq 0 \quad \text{C.V. } x = -5$$
$$x = 5$$

Answer  $-5 \leq x \leq 5$





8 Solve  $2x^2 - 7x - 15 > 0$

[3 marks]

$$(2x+3)(x-5) > 0 \quad \text{C.V. } x = -\frac{3}{2}$$
$$x = 5$$

Answer  $x < -\frac{3}{2}$  or  $x > 5$

9 Solve  $3x^2 + 17x - 6 \leq 0$

[3 marks]

$$(3x-1)(x+6) \leq 0 \quad \text{C.V. } x = \frac{1}{3}$$
$$x = -6$$

Answer  $-6 \leq x \leq \frac{1}{3}$

10 Solve  $5x^2 - 13x + 6 \geq 0$

[3 marks]

$$(5x-3)(x-2) \geq 0 \quad \text{C.V. } x = \frac{3}{5}$$
$$x = 2$$

Answer  $x \leq \frac{3}{5}$  or  $x \geq 2$

11 Solve  $2x^2 + 15x + 24 < 3 - 2x$

[4 marks]

$$2x^2 + 17x + 21 < 0$$

$$(2x+3)(x+7) < 0 \quad \text{C.V. } x = -\frac{3}{2}$$
$$x = -7$$

Answer  $-7 < x < -\frac{3}{2}$



Turn over ►

12 (a) Solve  $x^2 - 2x - 8 < 0$ 

[2 marks]

$$(x-4)(x+2) < 0$$

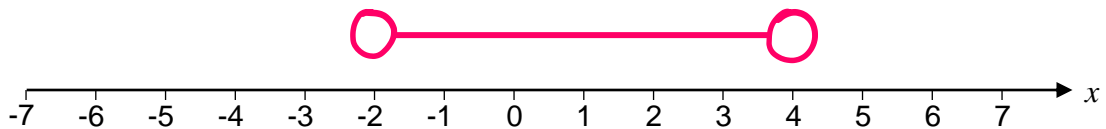
$$\text{C.V. } x = 4$$

$$x = -2$$

$$\text{Answer } -2 < x < 4$$

12 (b) Show the solution  $x^2 - 2x - 8 < 0$  on the number line below.

[1 mark]

13 (a) Solve  $x^2 - 7x + 10 \leq 0$ 

[2 marks]

$$(x-5)(x-2) \leq 0$$

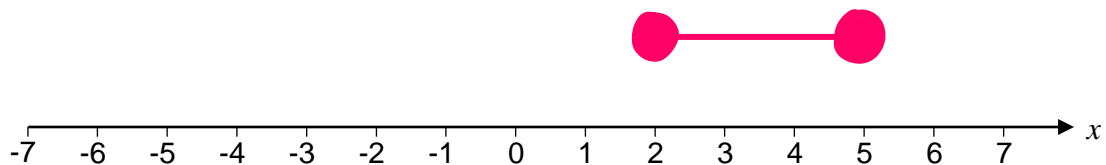
$$\text{C.V. } x = 5$$

$$x = 2$$

$$\text{Answer } 2 \leq x \leq 5$$

13 (b) Show the solution  $x^2 - 7x + 10 \leq 0$  on the number line below.

[1 mark]



14

Find a set of possible values of  $x$  for which

[4 marks]

$$4x - 5 < 19 \quad \text{and} \quad x^2 - 8x - 20 < 0$$

$$4x - 5 < 19$$

$$4x < 24$$

$$x < 6$$

$$(x-10)(x+2) < 0$$

$$\text{C.V. } x = 10$$

$$x = -2$$

$$-2 < x < 10$$

both are true when  $-2 < x < 6$ 

Answer  $-2 < x < 6$ 

15

Find a set of possible values of  $x$  for which

[4 marks]

$$6x + 1 > 16 \quad \text{and} \quad x^2 - 8x + 12 < 0$$

$$6x + 1 > 16$$

$$6x > 15$$

$$x > \frac{15}{6}$$

$$x > \frac{5}{2}$$

$$(x-6)(x-2) < 0$$

$$\text{C.V. } x = 6$$

$$x = 2$$

$$2 < x < 6$$

both are true when  $\frac{5}{2} < x < 6$ 

Answer  $\frac{5}{2} < x < 6$ 


16

Find a set of possible values of  $x$  for which

[5 marks]

$$x^2 - 11x + 10 < 0 \quad \text{and} \quad 2x^2 + 3x - 20 < 0$$

$$(x-10)(x-1) < 0 \quad (2x-5)(x+4) < 0$$

C.V.  $x = 10$

C.V.  $x = \frac{5}{2}$

$x = 1$

$x = -4$

$1 < x < 10$

$-4 < x < \frac{5}{2}$

both are true when  $1 < x < \frac{5}{2}$ 

Answer

$1 < x < \frac{5}{2}$

17

Find a set of possible values of  $x$  for which

[5 marks]

$$x^2 - 9 \geq 0 \quad \text{and} \quad 2x^2 - 13x + 15 < 0$$

$$(x+3)(x-3) \geq 0$$

$$(2x-3)(x-5) < 0$$

C.V.  $x = -3$

C.V.  $x = \frac{3}{2}$

$x = 3$

$x = 5$

$x \leq -3 \text{ or } x \geq 3$

$\frac{3}{2} < x < 5$

both true when  $3 \leq x < 5$ 

Answer

$3 \leq x < 5$

