



Quadratic Inequalities

← REVISE THIS TOPIC

1 Solve $x^2 + 7x + 10 < 0$

$$(x+2)(x+5) < 0$$

C.V. $x = -2$
 $x = -5$

$$-5 < x < -2$$

(Total for Question 1 is 2 marks)

2 Solve $x^2 - 9x + 20 > 0$

$$(x-5)(x-4) > 0$$

C.V. $x = 5$
 $x = 4$

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

(Total for Question 2 is 2 marks)

3 Solve $x^2 + 2x - 15 < 0$

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

C.V. $x = -5$
 $x = 3$

$$-5 < x < 3$$

(Total for Question 3 is 2 marks)



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

$$(x + 4)(x - 3) > 0$$

C.V. $x = -4$
 $x = 3$

$$x < -4 \text{ or } x > 3$$

(Total for Question 4 is 2 marks)

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

$$(x - 6)(x + 4) \leq 0$$

C.V. $x = 6$
 $x = -4$

$$-4 \leq x \leq 6$$

(Total for Question 5 is 2 marks)

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

$$(x - 2)(x - 15) \geq 0$$

C.V. $x = 2$
 $x = 15$

$$x \leq 2 \text{ or } x \geq 15$$

(Total for Question 6 is 2 marks)

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

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

C.V. $x = -5$
 $x = 5$

$$-5 \leq x \leq 5$$

(Total for Question 7 is 2 marks)



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

$$(2x+3)(x-5) > 0$$

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

$$x = 5$$

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

(Total for Question 8 is 3 marks)

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

$$(3x-1)(x+6) \leq 0$$

$$\text{C.V. } x = \frac{1}{3}$$

$$x = -6$$

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

(Total for Question 9 is 3 marks)

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

$$(5x-3)(x-2) \geq 0$$

$$\text{C.V. } x = \frac{3}{5}$$

$$x = 2$$

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

(Total for Question 10 is 3 marks)

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

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

$$(2x+3)(x+7) < 0$$

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

$$x = -7$$

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

(Total for Question 11 is 4 marks)



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

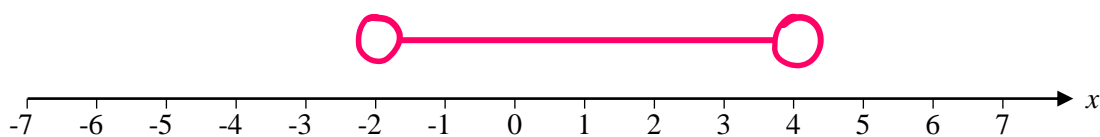
$$(x-4)(x+2) < 0$$

$$\begin{aligned} \text{C.V. } x &= 4 \\ x &= -2 \end{aligned}$$

$$\underline{-2 < x < 4}$$

(2)

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



(1)

(Total for Question 12 is 3 marks)

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

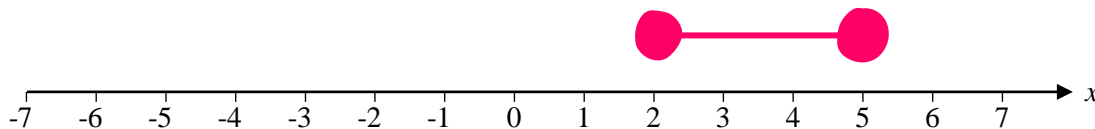
$$(x-5)(x-2) \leq 0$$

$$\begin{aligned} \text{C.V. } x &= 5 \\ x &= 2 \end{aligned}$$

$$\underline{2 \leq x \leq 5}$$

(2)

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



(1)

(Total for Question 13 is 3 marks)



14 Find a set of possible values of x for which

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

$$\begin{aligned}
 4x - 5 &< 19 \\
 4x &< 24 \\
 x &< 6
 \end{aligned}$$

$$\begin{aligned}
 (x-10)(x+2) &< 0 \\
 \text{C.V. } x &= 10 \\
 x &= -2 \\
 -2 &< x < 10
 \end{aligned}$$

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

$$-2 < x < 6$$

(Total for Question 14 is 4 marks)

15 Find a set of possible values of x for which

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

$$\begin{aligned}
 6x + 1 &> 16 \\
 6x &> 15 \\
 x &> \frac{15}{6} \\
 x &> \frac{5}{2}
 \end{aligned}$$

$$\begin{aligned}
 (x-6)(x-2) &< 0 \\
 \text{C.V. } x &= 6 \\
 x &= 2 \\
 2 &< x < 6
 \end{aligned}$$

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

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

(Total for Question 15 is 4 marks)



16 Find a set of possible values of x for which

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

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

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

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

$$x = 1$$

$$x = -4$$

$$1 < x < 10$$

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

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

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

(Total for Question 16 is 5 marks)

17 Find a set of possible values of x for which

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

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

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

$$\text{C.V. } x = -3$$

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

$$x = 3$$

$$x = 5$$

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

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

both true when $3 \leq x < 5$

$$3 \leq x < 5$$

(Total for Question 17 is 5 marks)

