

Quadratic Inequalities

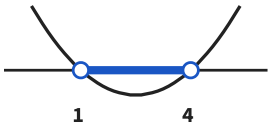
ANSWERS

1

Solve $x^2 - 5x + 4 < 0$

factorise

$$(x - 1)(x - 4)$$



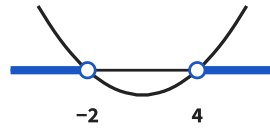
Answer $1 < x < 4$

2

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

factorise

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



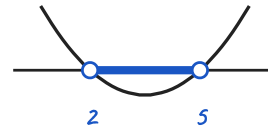
Answer $x < -2 \text{ or } x > 4$

3

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

factorise

$$(x - 2)(x - 5)$$



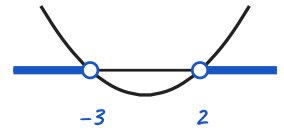
Answer $2 < x < 5$

4

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

factorise

$$(x + 3)(x - 2)$$

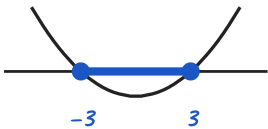


Answer $x < -3 \text{ or } x > 2$

5

Solve $x^2 - 9 \leq 0$

$$(x + 3)(x - 3)$$

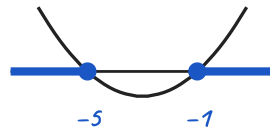


Answer $-3 \leq x \leq 3$

6

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

$$(x + 5)(x + 1)$$



Answer $x \leq -5 \text{ or } x \geq -1$

7

Write down all the integers that satisfy $x^2 < 10$

$$3^2 = 9 \text{ but } 4^2 = 16$$

Answer $-3, -2, -1, 0, 1, 2, 3$

8

Solve $x^2 - 5x < 0$

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

Answer $0 < x < 5$

Quadratic Inequalities further practice

ANSWERS

9

Solve $x^2 + 2x - 15 \geq 0$

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

Answer $x \leq -5 \text{ or } x \geq 3$

10

Solve $x^2 < 3x + 10$

$$x^2 - 3x - 10 < 0$$

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

Answer $-2 < x < 5$

11

How many whole numbers satisfy $x^2 + 3x - 18 \leq 0$?

$$(x + 6)(x - 3) \leq 0, \text{ so } -6 \leq x \leq 3$$

$$-6, -5, \dots, 2, 3$$

Answer 10

12

Solve $2x^2 - 7x + 3 > 0$

$$(2x - 1)(x - 3) > 0$$

Answer $x < \frac{1}{2} \text{ or } x > 3$

13

A stall sells phone cases at £ x each. Its daily profit is $P = 12x - x^2 - 20$ pounds. For which prices does it make a profit?

$$x^2 - 12x + 20 < 0$$

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

Answer $2 < x < 10$

14

A model rocket's height after t seconds is $h = 20t - 5t^2$ metres. For how many seconds is it higher than 15 m?

$$20t - 5t^2 > 15, \text{ so } t^2 - 4t + 3 < 0$$

$$1 < t < 3$$

Answer 2 seconds

15

A rectangle is x cm wide and $(x + 4)$ cm long. Its area is less than 21 cm^2 . Find the range of possible values of x .

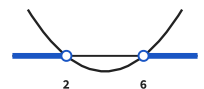
$$(x + 7)(x - 3) < 0, \text{ so } -7 < x < 3$$

but a width must be positive

Answer $0 < x < 3$

16

Leah solves $(x - 2)(x - 6) > 0$ and writes $2 < x < 6$. Explain her mistake and write the right answer.



between 2 and 6 the graph is below 0

try $x = 4: 2 \times (-2) = -4, \text{ not } > 0$

Answer $x < 2 \text{ or } x > 6$