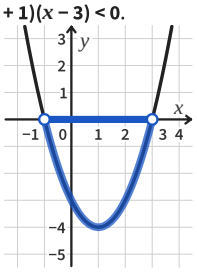
Quadratic inequalities

ANSWERS

1

The graph of $y = (x + 1)(x - 3)$ is drawn.

Solve $(x + 1)(x - 3) < 0$.



−1 and 3

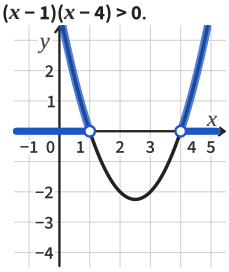
below

Answer: $-1 < x < 3$

2

The graph of $y = (x - 1)(x - 4)$ is drawn.

Solve $(x - 1)(x - 4) > 0$.



1 and 4

above

Answer: $x < 1$ or $x > 4$

3

Solve $(x - 3)(x - 6) < 0$.



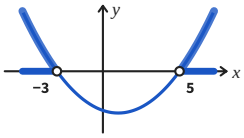
x = 3 or x = 6

below

Answer: $3 < x < 6$

4

Solve $(x + 3)(x - 5) > 0$.



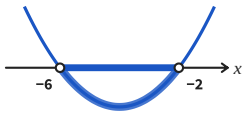
x = −3 or x = 5

above

Answer: $x < -3$ or $x > 5$

5 *Notice the change!*

Solve $(x + 6)(x + 2) < 0$.



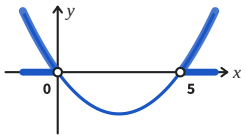
$x = -6$ or $x = -2$

below

Answer: $-6 < x < -2$

6

Solve $x(x - 5) > 0$.



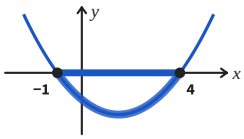
$x = 0$ or $x = 5$

above

Answer: $x < 0$ or $x > 5$

7 *Notice the change!*

Solve $(x + 1)(x - 4) \leq 0$. Write down the integers that fit.



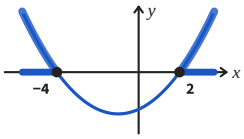
x = −1 or x = 4

$-1 \leq x \leq 4$

Integers: −1, 0, 1, 2, 3, 4

8

Solve $(x + 4)(x - 2) \geq 0$.



$x = -4$ or $x = 2$

on or above

Answer: $x \leq -4$ or $x \geq 2$

Quadratic inequalities *further practice*

ANSWERS

9

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

$x = 4$ or $x = -2$

below: in between

Answer: $-2 < x < 4$

10

Solve $(x + 7)(x - 1) > 0$.

$x = -7$ or $x = 1$

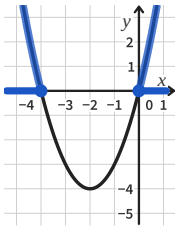
above: the two outside parts

Answer: $x < -7$ or $x > 1$

11

The graph of $y = x(x + 4)$ is drawn.

Use it to solve $x(x + 4) \geq 0$.



on or above the x axis

Answer: $x \leq -4$ or $x \geq 0$

12

How many integers fit $(x + 3)(x - 4) \leq 0$?

$-3 \leq x \leq 4$

−3, −2, −1, 0, 1, 2, 3 and 4

Answer: 8

13

Write an inequality like $(x - 1)(x - 6) > 0$ whose answer is $-2 < x < 5$.

critical values −2 and 5

in between: below, so < 0

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

14

Leah solves $(x - 1)(x - 6) > 0$ and writes $1 < x < 6$. Explain her mistake and write the right answer.

$x = 3$ gives $2 \times (-3) = -6$, not > 0

> 0 is above: the outside parts

Answer: $x < 1$ or $x > 6$

15

Factorise $x^2 - 6x + 8$.

Then solve $x^2 - 6x + 8 < 0$.

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

critical values 2 and 4: below

Answer: $2 < x < 4$

16

Tom says $x^2 \leq 36$ means $x \leq 6$.

Give a value of x that shows he is wrong. Then write the right answer.

$x = -7$: $-7 \leq 6$, but $49 > 36$

$(x + 6)(x - 6) \leq 0$: on or below

Answer: $-6 \leq x \leq 6$