

The Quadratic Formula

GCSE Maths · Practice Questions

20 questions · 62 marks total

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Section A · Foundation

Questions 1–3 are the most straightforward; they get harder as you go on. Question 10 is the most challenging.

1 [1 mark]

For the equation $2x^2 + 5x - 3 = 0$, write down the values of a , b and c .

.....

2 [2 marks]

Work out the value of $b^2 - 4ac$ for $x^2 + 3x - 4 = 0$

.....

3 [2 marks]

Use the quadratic formula to solve $x^2 + 3x - 4 = 0$

.....

4 [2 marks]

Work out $b^2 - 4ac$ for $2x^2 - 4x + 5 = 0$ and say what this tells you about the solutions.

.....

5 [3 marks]

Use the quadratic formula to solve $x^2 - 6x + 5 = 0$

.....

6 [3 marks]

Solve $x^2 + 2x - 1 = 0$

Give your answers to 2 decimal places.

.....

7

[3 marks]

Solve $2x^2 + 5x + 1 = 0$

Give your answers to 2 decimal places.

8

[3 marks]

Solve $x^2 - 4x - 3 = 0$, giving your answers in surd form.

9

[4 marks]

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

10

[4 marks]

A ball is thrown upwards. Its height, h metres, after t seconds is given by $h = 20t - 5t^2$

(a) Find the two times when the ball is 15 m above the ground.

(b) Explain why there are two answers.

Section B · Higher

Higher-tier style. Again, questions 1–3 are the gentlest and question 10 is the hardest.

1

[2 marks]

Solve $x^2 + 5x + 2 = 0$, giving your answers to 2 decimal places.

2

[2 marks]

Solve $2x^2 - 3x - 4 = 0$, giving your answers to 2 decimal places.

3

[3 marks]

Solve $5x^2 + 2x - 2 = 0$, giving your answers in surd form as simply as possible.

4

[3 marks]

Solve $3x^2 - 6x + 1 = 0$, giving your answers in surd form as simply as possible.

5

[4 marks]

Use the discriminant to state how many real solutions each equation has.

(a) $x^2 - 6x + 9 = 0$

(b) $2x^2 + x + 3 = 0$

(c) $x^2 + 4x - 1 = 0$

6

[4 marks]

The equation $x^2 + kx + 16 = 0$ has two equal roots.

Find the possible values of k .

7

[4 marks]

The equation $x^2 + 6x + k = 0$ has two different real solutions.

Find the range of possible values of k .

8

[4 marks]

Solve $(2x - 1)(x + 3) = 5$

Give your answers to 2 decimal places.

9

[4 marks]

A rectangle has width x cm and length $(x + 3)$ cm.

Its area is 15 cm^2 .

Work out the width of the rectangle, correct to 2 decimal places.

10

[5 marks]

A stone is thrown from the top of a wall. Its height, h metres above the ground, t seconds later is given by

$$h = 1.5 + 12t - 5t^2$$

(a) Write down the height of the wall.

(b) Find the time when the stone hits the ground, to 2 decimal places.
