

GCSE Maths: The quadratic formula (Higher): worksheet

GCSE Maths - Quadratic and Simultaneous Equations - Higher - Lesson 14.9

Name: _____

Date: _____

Score: _____

18 questions. Write your answers in the spaces. Answers and step-by-step help are free at websink.site/gcse/maths/ch14-quadratics-simultaneous/higher/the-quadratic-formula/

Exercise 14I The quadratic formula Calculator allowed

1 Solve using the quadratic formula. These solutions are rational (whole numbers or fractions).

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

Answer: _____

(b) $3x^2 + x - 4 = 0$

Answer: _____

(c) $x^2 - 4x - 12 = 0$

Answer: _____

(d) $2x^2 + 7x + 3 = 0$

Answer: _____

(e) $5x^2 + 4x - 1 = 0$

Answer: _____

(f) $6x^2 - 5x - 4 = 0$

Answer: _____

2 Solve $x^2 + 5x + 2 = 0$. Give your answers correct to 2 decimal places.

Answer: _____

3 Solve $x^2 - 3x - 5 = 0$. Give your answers correct to 2 decimal places.

Answer: _____

4 Solve $2x^2 + 3x - 4 = 0$. Give your answers correct to 2 decimal places.

Answer: _____

5 Solve $3x^2 - 8x + 2 = 0$. Give your answers correct to 2 decimal places.

Answer: _____

6 Solve $4x^2 - 7x + 1 = 0$. Give your answers correct to 2 decimal places.

Answer: _____

7 Solve $5x^2 + 2x - 4 = 0$. Give your answers correct to 2 decimal places.

Answer: _____

8 Solve, giving your answers in the form $p \pm \sqrt{q}$ or as exact fractions.

(a) $x^2 + 4x + 1 = 0$

Answer:

(b) $x^2 - 2x - 7 = 0$

Answer:

(c) $x^2 + 6x + 2 = 0$

Answer:

(d) $x^2 - 8x + 9 = 0$

Answer:

(e) $2x^2 + 6x + 3 = 0$

Answer:

(f) $3x^2 - 6x - 1 = 0$

Answer:

- 9 Rearrange and solve $x^2 + 3x = 5$. Give your answers correct to 2 decimal places.

Answer:

- 10 Expand, rearrange and solve $x(x + 4) = 7$. Give your answers correct to 2 decimal places.

Answer:

- 11 Rearrange and solve $2x^2 = 5x + 4$. Give your answers correct to 2 decimal places.

Answer:

- 12 Expand, rearrange and solve exactly $(x + 2)(x - 3) = 5$. Give your answers in the form $p \pm \sqrt{q}$ or as exact fractions.

Answer:

- 13 Use the discriminant to decide how many solutions each equation has. You do not need to solve them.

(a) $x^2 + x + 1 = 0$

Answer:

(b) $x^2 - 4x + 4 = 0$

Answer:

(c) $x^2 - 3x - 1 = 0$

Answer:

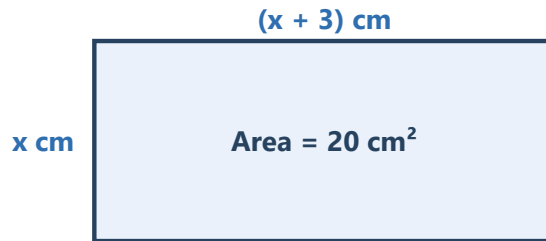
(d) $2x^2 + 3x + 5 = 0$

Answer:

- 14 The height, h metres, of a ball t seconds after it is thrown is given by $h = 12t - 5t^2$. Find the times when the ball is 6 m above the ground. Give your answers to 2 decimal places.

Answer:

- 15 A rectangle has width x cm and length $(x + 3)$ cm. Its area is 20 cm^2 . Find the width and the length, to 2 decimal places.



Answer:

- 16** A farmer has 40 m of fencing to fence three sides of a rectangular field. The fourth side is a wall. The two equal sides are each x m long and the area of the field is 160 m^2 . Find the possible values of x to 2 decimal places, and the possible dimensions.

Answer:

- 17** Use the quadratic formula to show that the solutions of $x^2 + 2x - 1 = 0$ are $x = -1 \pm \sqrt{2}$.

Answer:

- 18** Find all the values of k for which $x^2 + kx + 9 = 0$ has no real solutions.

Answer:
