

The quadratic formula

Use it when a quadratic will not factorise, or the question asks for decimal places.

1 a, b and c

Make it = 0. What are a, b and c ? Keep the signs.

$$ax^2 + bx + c = 0$$

*a minus in front makes b or c negative
no x term? then $b = 0$*

2 The formula

Write the formula down.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

3 Substitute

Put the numbers in place of the letters.

$$x = \frac{-\boxed{b} \pm \sqrt{\boxed{b}^2 - 4 \times \boxed{a} \times \boxed{c}}}{2 \times \boxed{a}}$$

a negative number goes in brackets

4 Work out $b^2 - 4ac$

Work out the part under the square root.

$$b^2 - 4ac = \boxed{\text{one number}}$$

c negative? then the $4ac$ adds on

5 + and -

Work it out once with + and once with -.

$$x = \frac{-b + \sqrt{\boxed{\text{number}}}}{2a}$$

$$x = \frac{-b - \sqrt{\boxed{\text{number}}}}{2a}$$

6 Round

Give both answers to the accuracy asked for.

$$x = \boxed{\text{answer 1}} \text{ or } x = \boxed{\text{answer 2}}$$

usually 2 decimal places

The Maths Habit

The quadratic formula

Use it when a quadratic will not factorise, or the question asks for decimal places.

1 a, b and c

Make it = 0. What are a, b and c ? Keep the signs.

$$ax^2 + bx + c = 0$$

*a minus in front makes b or c negative
no x term? then $b = 0$*

2 The formula

Write the formula down.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

3 Substitute

Put the numbers in place of the letters.

$$x = \frac{-\boxed{b} \pm \sqrt{\boxed{b}^2 - 4 \times \boxed{a} \times \boxed{c}}}{2 \times \boxed{a}}$$

a negative number goes in brackets

4 Work out $b^2 - 4ac$

Work out the part under the square root.

$$b^2 - 4ac = \boxed{\text{one number}}$$

c negative? then the $4ac$ adds on

5 + and -

Work it out once with + and once with -.

$$x = \frac{-b + \sqrt{\boxed{\text{number}}}}{2a}$$

$$x = \frac{-b - \sqrt{\boxed{\text{number}}}}{2a}$$

6 Round

Give both answers to the accuracy asked for.

$$x = \boxed{\text{answer 1}} \text{ or } x = \boxed{\text{answer 2}}$$

usually 2 decimal places

The Maths Habit