The quadratic formula

ANSWERS

1

Write down the values of a, b and c.

(a) $3x^2 + 2x - 5 = 0$

$a =$ 3 $b =$ 2 $c =$ −5

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

$a =$ 1 $b =$ −4 $c =$ 1

2

Write down the values of a, b and c.

(a) $5x^2 - x - 3 = 0$

$a =$ 5 $b =$ −1 $c =$ −3

(b) $x^2 = 7x - 4$

$x^2 - 7x + 4 = 0$

$a =$ 1 $b =$ −7 $c =$ 4

3

Solve $x^2 + 6x + 8 = 0$.

$a =$ 1 $b =$ 6 $c =$ 8

$b^2 - 4ac =$ 6 $^2 - 4 \times$ 1 $\times$ 8

$= 4$

$x = \dfrac{-6 \pm \sqrt{4}}{2 \times 1}$

$x =$ −2 or −4

4

Solve $x^2 - 2x - 15 = 0$.

$a =$ 1 $b =$ −2 $c =$ −15

$b^2 - 4ac =$ (−2) $^2 - 4 \times$ 1 $\times$ (−15)

$= 64$

$x = \dfrac{-(-2) \pm \sqrt{64}}{2 \times 1}$

$x =$ 5 or −3

5

Solve $x^2 - 9x + 14 = 0$.

$a =$ 1 $b =$ −9 $c =$ 14

$b^2 - 4ac =$ (−9) $^2 - 4 \times$ 1 $\times$ 14

$= 25$

$x = \dfrac{-(-9) \pm \sqrt{25}}{2 \times 1}$

$x =$ 7 or 2

6

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

$a =$ 1 $b =$ 8 $c =$ 5

$b^2 - 4ac =$ 8 $^2 - 4 \times$ 1 $\times$ 5

$= 44$

$x = \dfrac{-8 \pm \sqrt{44}}{2 \times 1}$

$x =$ −0.68 or −7.32

7

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

$a =$ 1 $b =$ −5 $c =$ 3

$b^2 - 4ac =$ (−5) $^2 - 4 \times$ 1 $\times$ 3

$= 13$

$x = \dfrac{-(-5) \pm \sqrt{13}}{2 \times 1}$

$x =$ 4.30 or 0.70

8

Jo solves $x^2 - 6x + 4 = 0$. She writes

$$x = \frac{-6 \pm \sqrt{(36 - 16)}}{2}$$

Explain her mistake. Then solve it.
Give your answers to 2 decimal places.

b = −6, so −b = 6, not −6

$x =$ 5.24 or 0.76

The quadratic formula *further practice*

ANSWERS

9

Solve $x^2 + 3x - 1 = 0$.
Give your answers to 2 decimal places.

$b^2 - 4ac = 9 + 4 = 13$

$x = (-3 \pm \sqrt{13}) \div 2$

Answer $x = 0.30$ or -3.30

10

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

$b^2 - 4ac = 49 - 24 = 25$

$x = (-7 \pm 5) \div 4$

Answer $x = -0.5$ or -3

11

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

$b^2 - 4ac = 16 + 24 = 40$

$x = (4 \pm \sqrt{40}) \div 6$

Answer $x = 1.72$ or -0.39

12

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

$x^2 - 4x - 3 = 0$

$x = (4 \pm \sqrt{28}) \div 2$

Answer $x = 4.65$ or -0.65

13

Work out $b^2 - 4ac$ for $x^2 + 2x + 6 = 0$.
How many solutions does it have?

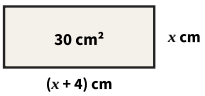
$4 - 24 = -20$

no square root of a negative

Answer −20, so none

14

The area of the rectangle is 30 cm^2.
Show that $x^2 + 4x - 30 = 0$, then find x to 2 decimal places.



$x(x + 4) = 30$

3.83 (not −7.83: a length)

Answer $x = 3.83$

15

Solve $x(x + 5) = 2$. Give your answers to 2 decimal places.

$x^2 + 5x - 2 = 0$

$x = (-5 \pm \sqrt{33}) \div 2$

Answer $x = 0.37$ or -5.37

16

Sam solves $2x^2 + 5x - 1 = 0$ and writes $x = \frac{-5 \pm \sqrt{33}}{2}$.

Explain his mistake. Then solve it to 2 decimal places.

$2a = 2 \times 2 = 4$, not 2

$x = (-5 \pm \sqrt{33}) \div 4$

Answer $x = 0.19$ or -2.69