Solving Quadratics with the Formula

ANSWERS

1

Solve $x^2 + 6x + 4 = 0$

Give your answers to 2 decimal places.

a, b and c: keep the signs

$a =$ 1 $b =$ 6 $c =$ 4

put the numbers in

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

$x =$ −0.76 or −5.24

2

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

Give your answers to 2 decimal places.

a, b and c: keep the signs

$a =$ 1 $b =$ 5 $c =$ −2

put the numbers in

$$x = \frac{-5 \pm \sqrt{5^2 - 4 \times 1 \times (-2)}}{2 \times 1}$$

$x =$ 0.37 or −5.37

3

Solve $3x^2 - 7x + 1 = 0$

Give your answers to 2 decimal places.

a, b and c: keep the signs

$a =$ 3 $b =$ −7 $c =$ 1

put the numbers in

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4 \times 3 \times 1}}{2 \times 3}$$

$x =$ 2.18 or 0.15

4

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

Give your answers to 2 decimal places.

$$x = \frac{-1 \pm \sqrt{1^2 - 4 \times 2 \times (-5)}}{2 \times 2}$$

$x =$ 1.35 or −1.85

5

Solve $x^2 = 3x + 2$

Give your answers to 2 decimal places.

Make one side zero first.

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

$$x = \frac{3 \pm \sqrt{17}}{2}$$

$x =$ 3.56 or −0.56

6

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

Give your answers to 2 decimal places.

Find a, b and c first.

$a = 5, b = -1, c = -2$

$$x = \frac{1 \pm \sqrt{41}}{10}$$

$x =$ 0.74 or −0.54

7

Ali solves $x^2 - 7x + 3 = 0$.

He types $-7^2 - 4 \times 1 \times 3$ into his calculator, gets −61 and says there are no solutions. Explain his mistake.

Then solve the equation, giving your answers to 2 decimal places.

-7^2 means $-(7^2)$: use $(-7)^2 = 49$

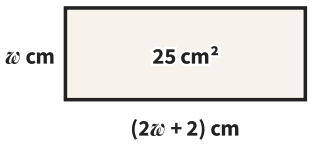
$$x = \frac{7 \pm \sqrt{37}}{2}$$

$x =$ 6.54 or 0.46

8

A rectangular label is w cm wide and $(2w + 2)$ cm long. Its area is 25 cm^2.

Find w to 2 decimal places.



$2w^2 + 2w - 25 = 0$

$w =$ 3.07 cm

Solving Quadratics with the Formula *further practice*

ANSWERS

9

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

Give your answers to 2 decimal places.

$x = \frac{-4 \pm \sqrt{40}}{6}$

Answer $x = 0.39$ or -1.72

10

Solve $2x^2 + 5 = 9x$

Give your answers to 2 decimal places.

$2x^2 - 9x + 5 = 0$

$x = \frac{9 \pm \sqrt{41}}{4}$

Answer $x = 3.85$ or 0.65

11

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

Give your answers to 2 decimal places.

$x^2 + x - 2 = 5$

$x^2 + x - 7 = 0$

Answer $x = 2.19$ or -3.19

12

A ball is kicked straight up. After t seconds its height is $20t - 5t^2$ metres. Find both times when the ball is 14 m high, to 2 decimal places.

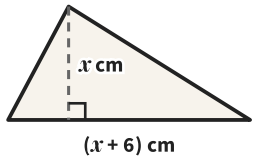
$5t^2 - 20t + 14 = 0$

up at 0.90 s, down at 3.10 s

Answer 0.90 s and 3.10 s

13

The triangle has an area of 18 cm^2. Find x to 2 decimal places.



$\frac{1}{2}x(x + 6) = 18$, so $x^2 + 6x - 36 = 0$

x is a length, so not -9.71

Answer $x = 3.71$

14

Solve $\frac{6}{x} = x + 2$

Give your answers to 2 decimal places.

$6 = x^2 + 2x$, so $x^2 + 2x - 6 = 0$

$x = \frac{-2 \pm \sqrt{28}}{2}$

Answer $x = 1.65$ or -3.65

15

The total of the whole numbers $1 + 2 + 3 + \ldots + n$ is $\frac{n(n+1)}{2}$.

Can the total be exactly 60? Use the formula to decide.

$n^2 + n - 120 = 0$

$n = 10.47$, not a whole number

Answer No: $n = 10.47$

16

Jo solves $x^2 + 3x - 1 = 0$ and writes $x = -3 \pm \frac{\sqrt{13}}{2}$, so $x = -1.20$ or -4.80.

Explain her mistake. Then find the right answers to 2 decimal places.

divide all of the top by 2

$x = \frac{-3 \pm \sqrt{13}}{2}$

Answer $x = 0.30$ or -3.30