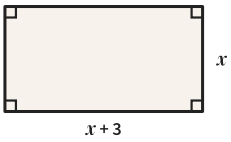
Area and quadratic equations

ANSWERS

1

The area of this rectangle is 40 cm².
Find x.



Area $x(x+3) = 40$

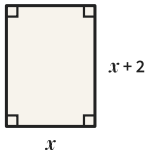
$x^2 + 3x - 40 = 0$

$(x - 5)(x + 8) = 0$

Answer $x = 5$

2

The area of this rectangle is 48 cm².
Find x.



Area $x(x+2) = 48$

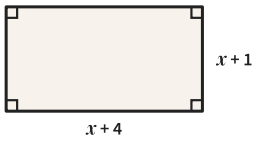
$x^2 + 2x - 48 = 0$

$(x - 6)(x + 8) = 0$

Answer $x = 6$

3

The area of this rectangle is 54 cm².
Find x.



Area $(x + 1)(x + 4) = 54$

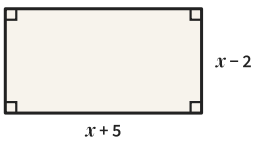
$x^2 + 5x - 50 = 0$

$(x - 5)(x + 10) = 0$

Answer $x = 5$

4

The area of this rectangle is 60 cm².
Find x.

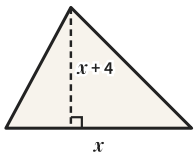


$(x - 7)(x + 10) = 0$

Answer $x = 7$

5

The area of this triangle is 16 cm².
Find its height.

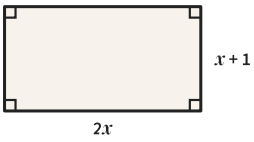


$x^2 + 4x - 32 = 0$, so $x = 4$

Answer 8 cm

6

The area of this rectangle is 60 cm².
Find its perimeter.

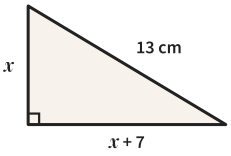


$x^2 + x - 30 = 0$, so $x = 5$

Answer 32 cm

7

Use Pythagoras to find x. Then find the area of the triangle.

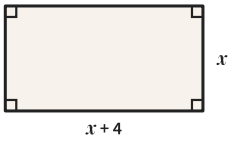


$x^2 + 7x - 60 = 0$, so $x = 5$

Answer 30 cm²

8

The area of this rectangle is 50 cm².
It will not factorise. Find x to 1 decimal place.



$x^2 + 4x - 50 = 0$, formula

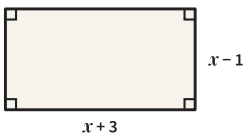
Answer $x = 5.3$

Area and quadratic equations *further practice*

ANSWERS

9

The area of this rectangle is 45 cm².
Find the length of each side.

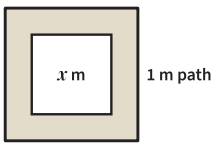


$(x + 8)(x - 6) = 0$

Answer 9 cm and 5 cm

10

A square pond of side x m has a path 1 m wide all round it. The path has an area of 32 m². Find x.

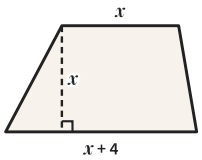


$(x + 2)^2 - x^2 = 4x + 4 = 32$

Answer $x = 7$

11

The area of this trapezium is 30 cm².
Find x to 2 decimal places.

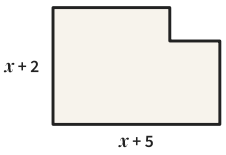


$x^2 + 2x - 30 = 0$, formula

Answer $x = 4.53$

12

A 3 cm by 2 cm corner is cut off this rectangle. The area left is 64 cm².
Find x.



$x^2 + 7x - 60 = 0$

Answer $x = 5$

13

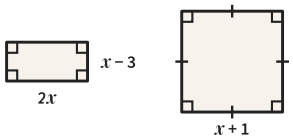
A rectangle is x cm wide and 3 cm longer than it is wide. Its area is 28 cm².
Show that $x^2 + 3x - 28 = 0$, then find the perimeter.

$x(x + 3) = 28$, $x = 4$

Answer 22 cm

14

The rectangle and the square have the same area. Find x to 1 decimal place.

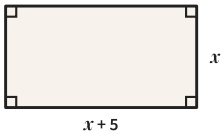


$x^2 - 8x - 1 = 0$

Answer $x = 8.1$

15

The area of this rectangle must be more than 50 cm². x is a whole number.
What is the smallest it can be?

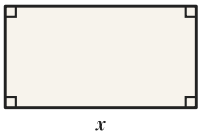


$x = 5$ gives exactly 50, not more

Answer $x = 6$

16

A rectangle has a perimeter of 20 cm and one side x cm. Show that its area is $10x - x^2$ and explain why the area cannot be more than 25 cm².



the other side is $10 - x$

Answer $25 - (x - 5)^2 \leq 25$