

GCSE Maths: Problems leading to quadratic equations (Higher): answers

GCSE Maths - Quadratic and Simultaneous Equations - Higher - Lesson 14.4

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch14-quadratics-simultaneous/higher/problems-leading-to-quadratic-equations/

Exercise 14D Problems leading to quadratic equations Non-calculator

1 Solve these number problems. In each case form an equation first.

- (a) The product of two consecutive positive whole numbers is 72. Find the numbers.

Answer: 8 and 9

- (b) The product of two consecutive positive whole numbers is 110. Find the numbers.

Answer: 10 and 11

- (c) The product of two consecutive positive whole numbers is 210. Find the numbers.

Answer: 14 and 15

2 Solve these rectangle problems.

- (a) A rectangle has width x cm and length $(x + 2)$ cm. Its area is 24 cm^2 . Find the width and the length.

Answer: width 4 cm, length 6 cm

- (b) A rectangle has width x cm and length $(x + 5)$ cm. Its area is 36 cm^2 . Find the width and the length.

Answer: width 4 cm, length 9 cm

- (c) A rectangle has width x cm and length $(x + 3)$ cm. Its area is 40 cm^2 . Find the width and the length.

Answer: width 5 cm, length 8 cm

- (d) A rectangle has width x cm and length $(x + 1)$ cm. Its area is 56 cm^2 . Find the width and the length.

Answer: width 7 cm, length 8 cm

3 The square of a number is 5 more than four times the number. Find the possible values of the number.

Answer: $x = -1$ or $x = 5$

4 A number added to its square gives 42. Find the two possible numbers.

Answer: $x = -7$ or $x = 6$

5 A rectangle has width w cm and length $(w + 5)$ cm. Its area is 14 cm^2 . Find the width and the length.

Answer: width 2 cm, length 7 cm

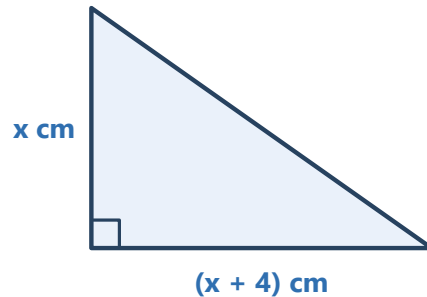
6 A rectangular garden has a perimeter of 34 m and an area of 60 m^2 . Find the length and the width of the garden.

Answer: 12 m by 5 m

7 Sam is x years old. His sister is 3 years younger. The product of their ages is 130. Find their ages.

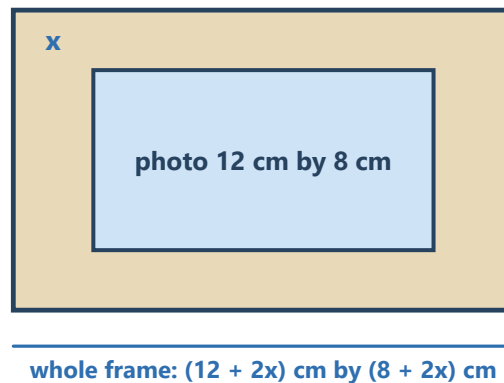
Answer: Sam 13 years, his sister 10 years

- 8 A triangle has base $(x + 4)$ cm and height x cm. Its area is 30 cm^2 . Find the base and the height.



Answer: base 10 cm, height 6 cm

- 9 A photograph measures 12 cm by 8 cm. It is put in a frame with a border of width x cm all round. The area of the whole frame, including the photograph, is 140 cm^2 . Find x .



Answer: $x = 1$ (the border is 1 cm wide)

- 10 Solve these problems about consecutive odd numbers. Form an equation first.

- (a) The product of two consecutive odd positive whole numbers is 143. Find the numbers.

Answer: 11 and 13

- (b) The product of two consecutive odd positive whole numbers is 195. Find the numbers.

Answer: 13 and 15

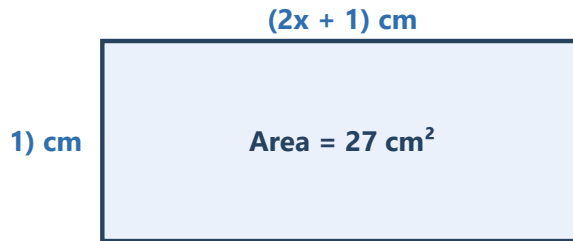
- (c) The product of two consecutive odd positive whole numbers is 99. Find the numbers.

Answer: 9 and 11

- 11 The sum of the squares of two consecutive whole numbers is 85. Find the two numbers. (There are two possible pairs.)

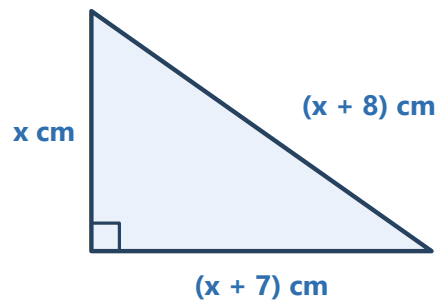
Answer: 6 and 7, or -7 and -6

- 12 A rectangle has length $(2x + 1)$ cm and width $(x - 1)$ cm. Its area is 27 cm^2 . Find x and write down the dimensions of the rectangle.



Answer: $x = 4$; 9 cm by 3 cm

- 13** The three sides of a right-angled triangle are x cm, $(x + 7)$ cm and $(x + 8)$ cm. Find the length of each side.



Answer: 5 cm, 12 cm, 13 cm

- 14** The sum of the squares of three consecutive whole numbers is 365. Find the three numbers. (There are two possible sets.)

Answer: 10, 11, 12 or -12 , -11 , -10

- 15** Explain why two consecutive whole numbers cannot have a product of 50.

Answer: $6 \times 7 = 42$ and $7 \times 8 = 56$, so 50 is skipped