Factorising Quadratics

GCSE Maths · Foundation tier · 16 questions · 36 marks

Name _____ Date _____ Score _____ / 36

Start at Level 1 and climb. Stuck? The worked answers show every step.

Level 1 · Warm-up **Level 2 · Build** **Level 3 · Exam-style** **Level 4 · Challenge (Foundation)**

Level 1 · Warm-up

9 marks

Quadratics $x^2 + bx + c$ with positive and negative numbers, and taking out x.

1 Factorise $x^2 + 7x + 10$. [2 marks]

Answer _____

2 Factorise $x^2 + 5x$. [1 mark]

Answer _____

3 Factorise $x^2 - 9x + 20$. [2 marks]

Answer _____

4 Factorise $x^2 + 2x - 15$. [2 marks]

Answer _____

5 Factorise $x^2 + 10x + 24$. [2 marks]

Answer _____

Level 2 · Build 7 marks
Harder signs, the difference of two squares, perfect squares and a first look at $ax^2 + bx + c$.

6 Factorise $x^2 - 3x - 28$. [2 marks]

Answer _____

7 Factorise $x^2 - 11x + 24$. [2 marks]

Answer _____

8 Factorise $x^2 - 64$. [1 mark]

Answer _____

9 Factorise $x^2 + 14x + 49$. [2 marks]

Answer _____

Level 3 · Exam-style 11 marks
Factorising fully, "hence" questions and spotting mistakes, in real GCSE style.

10 Factorise fully $3x^2 + 12x - 15$. [2 marks]

Answer _____

11 (a) Factorise $x^2 - 9$. [1 mark]

Answer _____

(b) Hence work out the value of $103^2 - 9$. You must not use a calculator, and you must show your working. [2 marks]

Answer _____

12 Sam factorises $x^2 - 5x - 14$ and writes $(x - 7)(x - 2)$. Explain Sam's mistake, and factorise $x^2 - 5x - 14$ correctly. [2 marks]

Answer _____

13 (a) A rectangle has area $(x^2 + 11x + 28)$ cm^2. Its width is $(x + 4)$ cm. Find an expression for its length. [2 marks]

Answer _____

(b) Find an expression for the perimeter of the rectangle. Give your answer in its simplest form. [2 marks]

Answer _____

Level 4 · Challenge (Foundation) 9 marks
Grade 4–5 problem solving: using factorising to calculate and to explain.

14 Use factorising to work out $87^2 - 13^2$. You must not use a calculator, and you must show your working. [2 marks]

Answer _____

15 (a) Factorise $x^2 + 6x + 9$. [2 marks]

Answer _____

(b) Hence explain why $x^2 + 6x + 9$ can never be negative. [1 mark]

Answer _____

16 (a) $x^2 - 10x + 21$ can be written as $(x - a)(x - b)$, where a and b are whole numbers and $a < b$. Find the values of a and b. [2 marks]

Answer _____

(b) Hence work out the value of $x^2 - 10x + 21$ when $x = 107$. You must not use a calculator. [2 marks]

Answer _____