Factorising Quadratics

GCSE Maths · Higher tier · 21 questions · 47 marks

Name _____ Date _____ Score _____ / 47

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**

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 11 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 _____

10 Factorise $2x^2 + 7x + 3$. [2 marks]

Answer _____

11 Factorise $3x^2 - 10x + 8$. [2 marks]

Answer _____

Level 3 · Exam-style 15 marks
Factorising fully, "hence" questions and spotting mistakes, in real GCSE style.

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

Answer _____

13 (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 _____

14 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 _____

15 (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 _____

16 Factorise $6x^2 + x - 2$. [2 marks]

Answer _____

17 Factorise fully $12x^2 - 27$. [2 marks]

Answer _____

Level 4 · Challenge 12 marks
Grade 8–9: algebraic difference of two squares, proof and unknown coefficients.

18 Factorise fully $(x + 3)^2 - (x - 1)^2$. [3 marks]

Answer _____

19 Prove that the difference between the squares of any two consecutive odd numbers is a multiple of 8. [3 marks]

Answer _____

20 $3x^2 + bx - 10 \equiv (3x + 5)(x + c)$. Find the value of b and the value of c. [3 marks]

Answer _____

21 (a) Factorise $4x^2 - 25$. [1 mark]

Answer _____

(b) Hence, or otherwise, factorise fully $4x^4 - 25x^2$. [2 marks]

Answer _____