

GCSE Maths: Factorising $ax^2 + bx + c$ (Higher): answers

GCSE Maths - Algebra Basics - Higher - Lesson 7.8

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch07-algebra-basics/higher/factorising-ax-bx-c/

Exercise 7I Factorising $ax^2 + bx + c$ Non-calculator

1 Factorise each expression.

(a) $2x^2 + 5x + 3$

Answer: $(x + 1)(2x + 3)$

(b) $2x^2 + 7x + 6$

Answer: $(x + 2)(2x + 3)$

(c) $3x^2 + 7x + 2$

Answer: $(x + 2)(3x + 1)$

(d) $5x^2 + 16x + 3$

Answer: $(x + 3)(5x + 1)$

(e) $2x^2 + 9x + 10$

Answer: $(x + 2)(2x + 5)$

(f) $3x^2 + 11x + 6$

Answer: $(x + 3)(3x + 2)$

2 Factorise each expression.

(a) $2x^2 - 7x + 3$

Answer: $(x - 3)(2x - 1)$

(b) $3x^2 - 8x + 4$

Answer: $(x - 2)(3x - 2)$

(c) $5x^2 - 13x + 6$

Answer: $(x - 2)(5x - 3)$

(d) $2x^2 - 11x + 12$

Answer: $(x - 4)(2x - 3)$

(e) $4x^2 - 12x + 9$

Answer: $(2x - 3)^2$

3 Factorise each expression.

(a) $2x^2 + x - 6$

Answer: $(x + 2)(2x - 3)$

(b) $3x^2 - 2x - 8$

Answer: $(x - 2)(3x + 4)$

(c) $5x^2 + 13x - 6$

Answer: $(x + 3)(5x - 2)$

(d) $6x^2 + x - 2$

Answer: $(2x - 1)(3x + 2)$

(e) $4x^2 - 3x - 1$

Answer: $(x - 1)(4x + 1)$

(f) $6x^2 - 5x - 6$

Answer: $(2x - 3)(3x + 2)$

4 Factorise each expression fully. (Look for a common factor first.)

(a) $12x^2 + 10x - 8$

Answer: $2(2x - 1)(3x + 4)$

(b) $6x^2 + 14x + 4$

Answer: $2(x + 2)(3x + 1)$

(c) $9x^2 - 6x - 24$

Answer: $3(x - 2)(3x + 4)$

(d) $10x^2 - 5x - 5$

Answer: $5(x - 1)(2x + 1)$

5 Factorise each expression. They are not all the same type.

(a) $9x^2 - 4$

Answer: $(3x - 2)(3x + 2)$

(b) $4x^2 + 8x$

Answer: $4x(x + 2)$

(c) $2x^2 + 11x + 5$

Answer: $(x + 5)(2x + 1)$

(d) $x^2 - 3x - 10$

Answer: $(x - 5)(x + 2)$

(e) $6x^2 - 7x - 3$

Answer: $(2x - 3)(3x + 1)$

6 Factorise each expression.

(a) $2y^2 + 5y + 2$

Answer: $(y + 2)(2y + 1)$

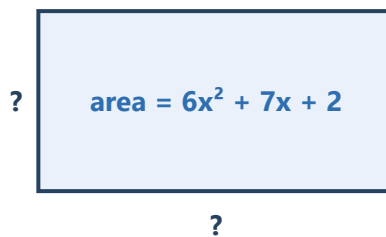
(b) $3p^2 - 4p - 4$

Answer: $(p - 2)(3p + 2)$

(c) $6m^2 - 17m + 12$

Answer: $(2m - 3)(3m - 4)$

7 A rectangle has area $(6x^2 + 7x + 2) \text{ cm}^2$. (a) Factorise the expression to find the lengths of the sides. (b) Find an expression for the perimeter.



(a) the sides

Answer: $(3x + 2) \text{ cm}$ and $(2x + 1) \text{ cm}$

(b) the perimeter

Answer: $10x + 6 \text{ cm}$

8 Jo factorises $2x^2 + 7x + 3$ as $(2x + 3)(x + 1)$. Show that Jo is wrong and find the correct factorisation.

Answer: $(2x + 1)(x + 3)$

9 Explain why $2x^2 + 3x + 4$ cannot be factorised into two brackets with whole numbers.

Answer: No pair of whole numbers multiplies to 8 and adds to 3.

10 $2x^2 + kx + 3$ can be factorised into two brackets with whole numbers. Find all the possible values of k .

Answer: $k = 5, 7, -5 \text{ or } -7$

11 The area of a rectangular field is $(4x^2 + 16x + 15) \text{ m}^2$. Its length is $(2x + 5) \text{ m}$. Find an expression for the width.

Answer: $(2x + 3) \text{ m}$