

GCSE Maths: Factorising: common factors (Higher): answers

GCSE Maths - Algebra Basics - Higher - Lesson 7.6

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-common-factors/

Exercise 7F Factorising with common factors

Non-calculator

1 Factorise each expression.

(a) $4x + 8$

Answer: $4(x + 2)$

(b) $6y - 9$

Answer: $3(2y - 3)$

(c) $10 + 15a$

Answer: $5(3a + 2)$

(d) $12 - 8b$

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

(e) $14m + 21$

Answer: $7(2m + 3)$

(f) $9p - 27$

Answer: $9(p - 3)$

2 Factorise each expression.

(a) $x^2 + 3x$

Answer: $x(x + 3)$

(b) $y^2 - 4y$

Answer: $y(y - 4)$

(c) $a^2 + a$

Answer: $a(a + 1)$

(d) $5m^2 - m$

Answer: $m(5m - 1)$

3 Factorise each expression fully.

(a) $6x^2 + 9x$

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

(b) $10a^2 - 15a$

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

(c) $4y^2 + 12y$

Answer: $4y(y + 3)$

(d) $8m^2 - 2m$

Answer: $2m(4m - 1)$

4 Complete each factorisation.

(a) $5x + 20 = 5(x + ?)$

Answer: 4

(b) $8y - 12 = 4(? - 3)$

Answer: $2y$

(c) $x^2 + 6x = x(? + 6)$

Answer: x

(d) $3a^2 + 12a = 3a(a + ?)$

Answer: 4

5 Factorise each expression fully.

(a) $6ab + 9a$

Answer: $3a(2b + 3)$

(b) $4pq - 6q$

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

(c) $12xy + 8y$

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

(d) $5mn - 10n$

Answer: $5n(m - 2)$

6 Factorise each expression fully.

(a) $4x + 8y + 12$

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

(b) $10a - 15b + 5$

Answer: $5(2a - 3b + 1)$

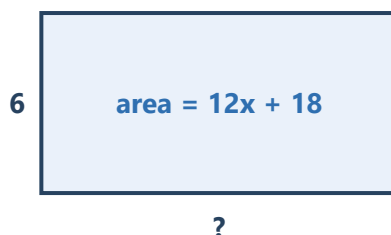
(c) $3m^2 + 6m + 9$

Answer: $3(m^2 + 2m + 3)$

7 Eve factorises $6x + 12$ and writes $2(3x + 6)$. Is this fully factorised? Explain, and write the correct answer.

Answer: No. $3x + 6$ still has a common factor of 3. The full answer is $6(x + 2)$

- 8 The area of a rectangle is $(12x + 18) \text{ cm}^2$. The width of the rectangle is 6 cm. Write an expression for the length.



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

- 9 Mia buys 8 pens at x pence each and 8 rulers at y pence each. The total cost is $(8x + 8y)$ pence. Write this total in a factorised form, and explain what the factorised form tells you.

Answer: $8(x + y)$. It is 8 sets, each costing $(x + y)$ pence.

- 10 Dan factorises $6x + 9$ as $3(2x + 9)$. Show that he is wrong by expanding his answer, and write the correct answer.

Answer: $3(2x + 9) = 6x + 27$, which is not $6x + 9$. The correct answer is $3(2x + 3)$

- 11 Factorise each expression fully.

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

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

(b) $4x^3y - 6x^2y^2$

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

(c) $12a^3 + 18a^2b - 6ab^2$

Answer: $6a(2a^2 + 3ab - b^2)$

(d) $15p^2q - 10pq^2 + 5pq$

Answer: $5pq(3p - 2q + 1)$

- 12 Factorise each expression.

(a) $3(x + 4) + y(x + 4)$

Answer: $(x + 4)(3 + y)$

(b) $x(x - 2) + 5(x - 2)$

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

(c) $a(b + 3) - 2(b + 3)$

Answer: $(b + 3)(a - 2)$

- 13 Factorise fully $15x^2y - 10xy^2$, and check your answer by expanding.

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

- 14** The area of a rectangle is $(6x^2 + 9x) \text{ cm}^2$. Its length is $3x \text{ cm}$. Find the width and the perimeter of the rectangle, in terms of x .

(a) the width

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

(b) the perimeter

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

- 15** $24x + 36$ can be written in the form $a(bx + c)$, where a , b and c are whole numbers and a is bigger than 1. Find all the ways of doing this. Which one is fully factorised?

Answer: $2(12x + 18)$, $3(8x + 12)$, $4(6x + 9)$, $6(4x + 6)$, $12(2x + 3)$. Only $12(2x + 3)$ is fully factorised.