

GCSE Maths: Expanding double brackets (Higher): answers

GCSE Maths - Algebra Basics - Higher - Lesson 7.5

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/expanding-double-brackets/

Exercise 7E Expanding double brackets Non-calculator

1 Expand and simplify.

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

Answer: $x^2 + 5x + 6$

(b) $(x + 5)(x + 1)$

Answer: $x^2 + 6x + 5$

(c) $(x + 4)(x + 6)$

Answer: $x^2 + 10x + 24$

(d) $(y + 7)(y + 2)$

Answer: $y^2 + 9y + 14$

(e) $(a + 3)(a + 8)$

Answer: $a^2 + 11a + 24$

2 Expand and simplify.

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

Answer: $x^2 + 3x - 10$

(b) $(x + 3)(x - 4)$

Answer: $x^2 - x - 12$

(c) $(x - 1)(x - 6)$

Answer: $x^2 - 7x + 6$

(d) $(a - 5)(a - 2)$

Answer: $a^2 - 7a + 10$

(e) $(y - 3)(y + 8)$

Answer: $y^2 + 5y - 24$

3 Expand and simplify.

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

Answer: $x^2 + 4x + 4$

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

Answer: $x^2 - 10x + 25$

(c) $(x + 10)^2$

Answer: $x^2 + 20x + 100$

(d) $(y - 1)^2$

Answer: $y^2 - 2y + 1$

4 Expand and simplify.

(a) $(2x + 1)(x + 3)$

Answer: $2x^2 + 7x + 3$

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

Answer: $3x^2 + 10x - 8$

(c) $(2x + 3)(2x + 5)$

Answer: $4x^2 + 16x + 15$

(d) $(4x - 1)(x - 2)$

Answer: $4x^2 - 9x + 2$

5 Expand and simplify. What do you notice about your answers?

(a) $(x + 3)(x - 3)$

Answer: $x^2 - 9$

(b) $(a + 8)(a - 8)$

Answer: $a^2 - 64$

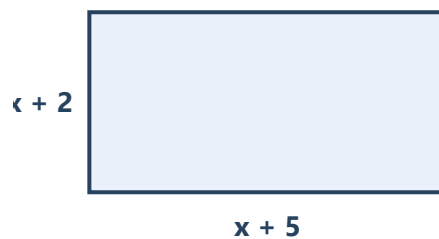
(c) $(2x + 5)(2x - 5)$

Answer: $4x^2 - 25$

(d) $(y - 7)(y + 7)$

Answer: $y^2 - 49$

6 The rectangle has length $(x + 5)$ cm and width $(x + 2)$ cm. Show that its area is $(x^2 + 7x + 10)$ cm².



Answer: $x^2 + 7x + 10$ cm²

7 A square has sides of length $(x + 3)$ cm. Write and simplify an expression for (a) its area (b) its perimeter.

(a) the area

Answer: $x^2 + 6x + 9 \text{ cm}^2$

(b) the perimeter

Answer: $4x + 12 \text{ cm}$

8 A rectangle has length $(x + 7)$ cm and width $(x - 2)$ cm. (a) Expand and simplify $(x + 7)(x - 2)$. (b) Use your answer to find the area of the rectangle when $x = 5$.

(a) Expand and simplify $(x + 7)(x - 2)$.

Answer: $x^2 + 5x - 14$

(b) Find the area when $x = 5$.

Answer: 36 cm^2

9 Ben writes $(x + 4)^2 = x^2 + 16$. Explain his mistake and write the correct expansion.

Answer: He squared each term and missed the middle term. $x^2 + 8x + 16$

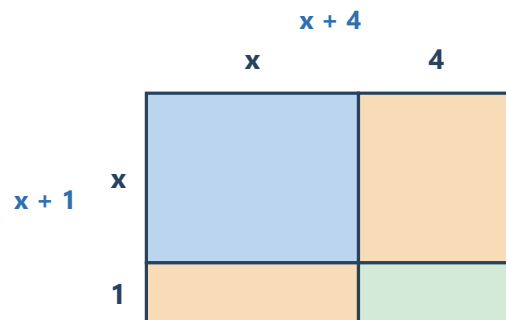
10 Show that $(x + 3)(x + 4) - (x + 1)(x + 6) = 6$.

Answer: 6

11 Explain why $(x + 5)^2$ is not equal to $x^2 + 25$. Use $x = 1$ in your explanation.

Answer: At $x = 1$: $(1 + 5)^2 = 36$ but $1^2 + 25 = 26$.

12 The diagram shows a rectangle that is $(x + 4)$ long and $(x + 1)$ wide, cut into four parts. Work out the area of each part, then write the expanded and simplified expression for the whole area.



Answer: $x^2 + 5x + 4$

13 Expand and simplify.

(a) $(x + 1)(x + 2)(x + 3)$

Answer: $x^3 + 6x^2 + 11x + 6$

(b) $(x - 1)(x + 2)(x + 4)$

Answer: $x^3 + 5x^2 + 2x - 8$

(c) $(x + 2)(x + 2)(x - 1)$

Answer: $x^3 + 3x^2 - 4$

(d) $(2x + 1)(x + 3)(x - 2)$

Answer: $2x^3 + 3x^2 - 11x - 6$

14 Expand and simplify.

(a) $(x + 2)(x^2 + 3x - 1)$

Answer: $x^3 + 5x^2 + 5x - 2$

(b) $(2x - 1)(x^2 - x + 4)$

Answer: $2x^3 - 3x^2 + 9x - 4$

(c) $(x - 3)(x^2 + 3x + 9)$

Answer: $x^3 - 27$

15 Expand and simplify.

(a) $(x + 2y)(x - 3y)$

Answer: $x^2 - xy - 6y^2$

(b) $(2a + b)^2$

Answer: $4a^2 + 4ab + b^2$

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

Answer: $9a^2 - 12ab + 4b^2$

16 Expand and simplify $(x + 3)^3$.

Answer: $x^3 + 9x^2 + 27x + 27$

17 Expand $(x + a)(x + b)$ and write the middle term and the last term in terms of a and b .

Answer: $x^2 + (a + b)x + ab$

18 Show that $(x + 5)(x - 5) - (x + 3)(x - 3) = -16$.

Answer: -16