



THIRD SPACE
LEARNING

Diagnostic Questions

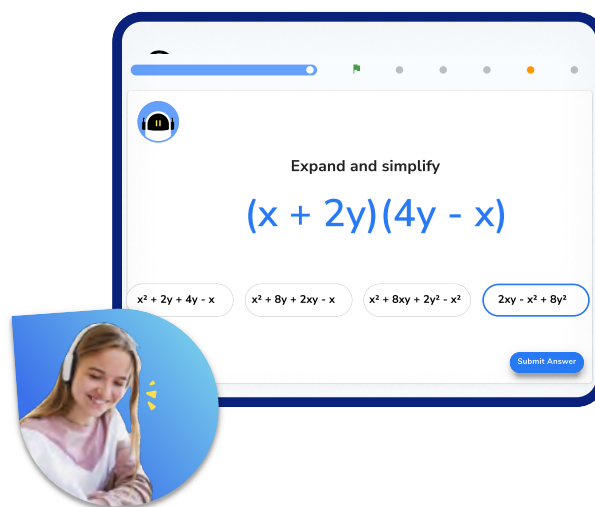
Expanding Brackets | Algebra

This resource in a nutshell

Diagnostic questions are a quick and easy way of assessing your students' knowledge and understanding of a particular topic.

Students may be struggling with **expanding brackets** for a number of different reasons. Diagnostic questions can help to identify the particular misconception that the student has and help to determine the specific support they will need in order to improve.

They are low stakes and support students developing metacognition around how their learning is progressing and what they need to do to improve further.



At Third Space Learning, we use diagnostic questions before and after online tutoring sessions to identify gaps and track progress, an example of this is shown above.

How to use the questions in this resource

There are 20 multiple choice questions, each designed to assess each of the key skills required to master **expanding brackets**. Each question has **one correct answer** and **three carefully chosen incorrect answers** that are designed to identify and highlight fundamental misconceptions, including: **Collecting like terms**, **Negative numbers**, and **Powers**.

When answering these questions, students should be **encouraged to explain why they have chosen a particular answer**, and why the other three answers are incorrect. This can be done verbally in small groups, or written down on the worksheet or in their books.

This resource has been designed to be as **flexible** as possible with questions that can be easily chopped up and reordered, and come with a separate answer sheet that details all of the misconceptions highlighted in the answers.

Diagnostic Questions: Expanding Brackets

1. Expand:

$$6(y - 2)$$

A) $6y - 2$	B) $y - 12$
C) $6y - 12$	D) $-12y$

2. Expand:

$$-2(x + 6)$$

A) $2x + 12$	B) $-2x + 12$
C) $-2x - 6$	D) $-2x - 12$

3. Expand and simplify:

$$3(m + 2) + 2(m + 4)$$

A) $3m + 6 + 2m + 8$	B) $5m + 6$
C) $5m + 14$	D) $5m + 11$

Diagnostic Questions: Expanding Brackets

4. Expand and simplify:

$$6(n + 5) - 3(n - 2)$$

A) $3n + 36$	B) $3n + 24$
C) $3n + 7$	D) $3n + 3$

5. Expand:

$$y(2y - 3)$$

A) $2y - 3$	B) $2y^2 - 3$
C) $5y^2$	D) $2y^2 - 3y$

6. Expand:

$$-5x(2x + 4)$$

A) $-10x^2 + 20x$	B) $10x^2 - 20x$
C) $-10x^2 - 20x$	D) $10x^2 + 20x$

Diagnostic Questions: Expanding Brackets

7. Expand:

$$3y(2 + 7y - 4x)$$

A) $6y + 21y^2 + 12xy$	B) $6y + 21y - 12xy$
C) $6y + 21y^2 - 12xy$	D) $6 + 21y^2 - 12xy$

8. Expand:

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

A) $3x^2 + 4x$	B) $3x^2 + 2x$
C) $3x^2 + 2$	D) $5x^2$

9. Expand and simplify:

$$y(y + 1) - y(3y + 5)$$

A) $-2y^2 - 4y$	B) $4y^2 - 4y$
C) $-2y^2 + 6y$	D) $2y^2 - 4y$

Diagnostic Questions: Expanding Brackets

10. Expand and simplify:

$$(x + 5)(x + 6)$$

A) $2x + 11$	B) $x^2 + 11x + 30$
C) $x^2 + 5x + 30$	D) $x^2 + 30$

11. Expand and simplify:

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

A) $x^2 - 2x + 8$	B) $x^2 - 6x - 8$
C) $x^2 - 2x - 8$	D) $x^2 + 2x - 8$

12. Expand and simplify:

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

A) $2x^2 + 8x + 12$	B) $x^2 + 7x + 12$
C) $x^2 + 11x + 12$	D) $2x^2 + 11x + 12$

Diagnostic Questions: Expanding Brackets

13. Expand and simplify:

$$(3a - 2)(b + 1)$$

A) $3ab - 2b + 3a - 2$	B) $3a - 2b - 1$
C) $4ab - 2$	D) $3ab - 2$

14. Expand and simplify:

$$(x - 4)^2$$

A) $x^2 + 16$	B) $x^2 - 8x + 16$
C) $x^2 - 16$	D) $x^2 + 8x + 16$

15. Expand and simplify:

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

A) $4x^2 + 25$	B) $4x^2 - 20x + 25$
C) $4x^2 - 25$	D) $4x^2 + 20x + 25$

Diagnostic Questions: Expanding Brackets

16. Expand and simplify:

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

A) $x^3 + 4x^2 + 31x + 24$	B) $x^3 + 24$
C) $x^3 + 7x^2 + 28x + 24$	D) $x^3 + 9x^2 + 26x + 24$

17. Expand and simplify:

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

A) $2x^3 - 11x^2 - x + 30$	B) $2x^3 - 9x^2 - x + 30$
C) $x^3 - 4x^2 + 11x + 30$	D) $2x^3 - 11x^2 + 11x + 30$

18. Expand and simplify:

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

A) $x^3 + 12$	B) $x^3 + 3x^2 + 4x + 12$
C) $x^3 - x^2 - 8x + 12$	D) $x^3 - x^2 - 8x + 6$

Diagnostic Questions: Expanding Brackets

19. Expand and simplify:

$$(3 - x)(x + 5)(2x - 1)$$

A) $-2x^3 + 5x^2 + 32x - 15$	B) $-2x^3 - 3x^2 + 32x - 15$
C) $-2x^3 - 3x^2 + 28x + 15$	D) $-2x^3 - 15$

20. Expand and simplify:

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

A) $8x^3 + 1$	B) $8x^3 + 4x^2 + 14x + 1$
C) $8x^3 + 12x^2 + 6x + 1$	D) $8x^3 + 12x^2 + 8x + 3$

Diagnostic Questions: Expanding Brackets Answers

1. Expand:

$$6(y - 2)$$

- A) $6y - 2$ Student forgot to multiply second term by 6
- B) $y - 12$ Student forgot to multiply first term by 6
- C) $6y - 12$ Correct answer
- D) $-12y$ Student lacks the understanding of expanding brackets

2. Expand

$$-2(x + 6)$$

- A) $2x + 12$ Student used 2 instead of -2
- B) $-2x + 12$ Student forgot to use negative 2 for second term
- C) $-2x - 6$ Student forgot to multiply second term by -2
- D) $-2x - 12$ Correct answer

3. Expand and simplify

$$3(m + 2) + 2(m + 4)$$

- A) $3m + 6 + 2m + 8$ Student forgot to collect terms
- B) $5m + 6$ Student forgot to multiply second terms by outside terms
- C) $5m + 14$ Correct answer
- D) $5m + 11$ Student added second terms with outside terms

Diagnostic Questions: Expanding Brackets Answers

4. Expand and simplify:

$$6(n + 5) - 3(n - 2)$$

A) $3n + 36$ Correct answer

B) $3n + 24$ Student did -3×2 instead of -3×-2

C) $3n + 7$ Student forgot to multiply second terms by outside terms

D) $3n + 3$ Student forgot to multiply second terms by outside terms and used signs incorrectly

5. Expand:

$$y(2y - 3)$$

A) $2y - 3$ Student forgot to multiply terms by y

B) $2y^2 - 3$ Student forgot to multiply second term by y

C) $5y^2$ Student collected terms incorrectly

D) $2y^2 - 3y$ Correct answer

6. Expand:

$$-5x(2x + 4)$$

A) $-10x^2 + 20x$ Student forgot use of negative sign for second term

B) $10x^2 - 20x$ Student forgot use of negative sign for first term

C) $-10x^2 - 20x$ Correct answer

D) $10x^2 + 20x$ Student forgot use of negative sign

Diagnostic Questions: Expanding Brackets Answers

7. Expand:

$$3y(2 + 7y - 4x)$$

A) $6y + 21y^2 + 12xy$ Student forgot use of negative sign for last term

B) $6y + 21y - 12xy$ Student forgot second term has $y \times y = y^2$

C) $6y + 21y^2 - 12xy$ Correct answer

D) $6 + 21y^2 - 12xy$ Student forgot to multiply first term by y

8. Expand and simplify:

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

A) $3x^2 + 4x$ Student forgot use of negative sign in first bracket

B) $3x^2 + 2x$ Correct answer

C) $3x^2 + 2$ Student forgot to multiply second terms by x

D) $5x^2$ Student incorrectly collected terms

9. Expand and simplify:

$$y(y + 1) - y(3y + 5)$$

A) $-2y^2 - 4y$ Correct answer

B) $4y^2 - 4y$ Student forgot use of negative sign for $-y \times 3y$

C) $-2y^2 + 6y$ Student forgot use of negative sign for $-y \times 5$

D) $2y^2 - 4y$ Student collected squared terms incorrectly

Diagnostic Questions: Expanding Brackets Answers

10. Expand and simplify:

$$(x + 5)(x + 6)$$

A) $2x + 11$ Student lacks the understanding of expanding double brackets and just added terms.

B) $x^2 + 11x + 30$ Correct answer

C) $x^2 + 5x + 30$ Student forgot the $6x$ term

D) $x^2 + 30$ Student lacks the understanding of expanding double brackets and forgot the $5x$ and $6x$ terms

11. Expand and simplify:

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

A) $x^2 - 2x + 8$ Student multiplied the constant terms incorrectly

B) $x^2 - 6x - 8$ Student multiplied the x terms incorrectly

C) $x^2 - 2x - 8$ Correct answer

D) $x^2 + 2x - 8$ Student collected the x terms incorrectly

12. Expand and simplify:

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

A) $2x^2 + 8x + 12$ Student missed out the $3x$ term when expanding

B) $x^2 + 7x + 12$ Student forgot to use the 2 for any of the expanding

C) $x^2 + 11x + 12$ Student forgot the 2 in the x^2 term

D) $2x^2 + 11x + 12$ Correct answer

Diagnostic Questions: Expanding Brackets Answers

13. Expand and simplify:

$$(3a - 2)(b + 1)$$

A) $3ab - 2b + 3a - 2$ Correct answer

B) $3a - 2b - 1$ Student removed the brackets and so does not understand how to expand double brackets

C) $4ab - 2$ Student collected $3ab - 2b + 3a$ incorrectly

D) $3ab - 2$ Student forgot $-2b + 3a$ terms

14. Expand and simplify:

$$(x - 4)^2$$

A) $x^2 + 16$ Student forgot the $-4 \times x$ terms

B) $x^2 - 8x + 16$ Correct answer

C) $x^2 - 16$ Student forgot the $-4 \times x$ terms and squared -4 incorrectly, or squared each term within the bracket individually

D) $x^2 + 8x + 16$ Student forgot to use the negative sign

15. Expand and simplify:

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

A) $4x^2 + 25$ Student may have remembered that the middle terms cancelled but then used incorrect sign for last term

B) $4x^2 - 20x + 25$ Student calculated $(2x - 5)(2x - 5)$

C) $4x^2 - 25$ Correct answer

D) $4x^2 + 20x + 25$ Student calculated $(2x + 5)(2x + 5)$

Diagnostic Questions: Expanding Brackets Answers

16. Expand and simplify:

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

- A) $x^3 + 4x^2 + 31x + 24$ Student expanded to get $5x$ instead of $5x^2$
B) $x^3 + 24$ Student lacks the understanding of expanding triple brackets
C) $x^3 + 7x^2 + 28x + 24$ Student expanded to get $2x$ instead of $2x^2$
D) $x^3 + 9x^2 + 26x + 24$ Correct answer

17. Expand and simplify:

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

- A) $2x^3 - 11x^2 - x + 30$ Correct answer
B) $2x^3 - 9x^2 - x + 30$ Student obtained an x^2 instead of $-x^2$
C) $x^3 - 4x^2 + 11x + 30$ Student used x instead of $2x$
D) $2x^3 - 11x^2 + 11x + 30$ Student obtained a $6x$ instead of $-6x$

18. Expand and simplify:

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

- A) $x^3 + 12$ Student lacks the understanding of expanding triple brackets
B) $x^3 + 3x^2 + 4x + 12$ Student squared the individual terms in the second bracket before multiplying by the first
C) $x^3 - x^2 - 8x + 12$ Correct answer
D) $x^3 - x^2 - 8x + 6$ Student multiplied 3 by 2 instead of 4

Diagnostic Questions: Expanding Brackets Answers

19. Expand and simplify:

$$(3 - x)(x + 5)(2x - 1)$$

A) $-2x^3 + 5x^2 + 32x - 15$ Student obtained $4x^2$ instead of $-4x^2$

B) $-2x^3 - 3x^2 + 32x - 15$ Correct answer

C) $-2x^3 - 3x^2 + 28x + 15$ Student used 1 instead of -1

D) $-2x^3 - 15$ Student lacks the understanding of expanding triple brackets

20. Expand and simplify:

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

A) $8x^3 + 1$ Student lacks the understanding of expanding triple brackets

B) $8x^3 + 4x^2 + 14x + 1$ Student obtained $8x$ instead of $8x^2$

C) $8x^3 + 12x^2 + 6x + 1$ Correct answer

D) $8x^3 + 12x^2 + 8x + 3$ Student added constant terms when expanding

Where to go next?

For more diagnostic questions, and GCSE maths revision resources and worksheets to support students in fixing any misconceptions take a look at the free Third Space Learning [GCSE maths revision](#) pages.

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