

Name _____

Date _____

2.4 Expanding brackets — worksheet

Expand brackets in algebraic expressions. · 56 questions · Show your working.

Remember

- To **expand**, multiply **every** term inside the brackets by the term outside.
- $4(n + 3)$ means $4 \times (n + 3)$, so it equals $4 \times n + 4 \times 3 = 4n + 12$.
- Keep the signs: $2(x - 5) = 2x - 10$, not $2x + 10$.
- A letter can be outside the brackets too: $x(x + 6) = x^2 + 6x$.
- A negative outside changes every sign inside: $-2(x + 3) = -2x - 6$.
- A minus in front of a bracket means multiply by -1 : $-(x + 7) = -x - 7$.
- After expanding two brackets, collect the like terms.
- Check your expansion by substituting a number — both forms must give the same value.

A · Fluency — Expand single brackets, then expand and simplify.

1 Expand: **$4(n + 3)$**
_____2 Expand: **$2(x - 5)$**
_____3 Expand: **$3(2g + h - 7)$**
_____4 Expand: **$5(a + 2)$**
_____5 Expand: **$6(b - 1)$**
_____6 Expand: **$2(3c + 4)$**
_____7 Expand: **$7(2 - d)$**
_____8 Expand: **$4(3e + 2f)$**
_____9 Expand: **$3(x + 9)$**
_____10 Expand: **$3(y - 1)$**
_____11 Expand: **$8(2m + 3)$**
_____12 Expand: **$5(4 - 2p)$**
_____13 Expand: **$x(x + 3)$**

14 Expand: $a(a - 2)$

15 Expand: $2x(x + 4)$

16 Expand: $-2(x + 3)$

17 Expand: $-3(y - 2)$

18 Expand: $-(x + 7)$

19 Expand and simplify: $2(x + 3) + 3(x + 1)$

20 Expand and simplify: $4(a + 2) - 2(a + 1)$

21 Expand and simplify: $3(2y + 1) + 2(y - 4)$

22 Expand and simplify: $5(b - 2) + 3(b + 4)$

23 Expand and simplify: $2(3m + 1) - (m + 5)$

24 Expand and simplify: $6(c + 2) - 4(c - 1)$

B · Reasoning — Spot the mistake and check by substituting.

25 Copy and complete: $2(x + 9) = 2 \times x + 2 \times 9 = 2x + ?$

26 Copy and complete: $3(y - 1) = 3 \times y - 3 \times 1 = 3y - ?$

27 Marcus writes $4(n + 3) = 4n + 3$. What has he done wrong?

- ☐ He multiplied the 3 by 4 twice
- ☐ He forgot to multiply the 3 by the 4
- ☐ He should have added instead
- ☐ Nothing — it is correct

28 Sofia writes $2(x - 5) = 2x + 10$. What has she done wrong?

- ☐ She multiplied wrongly
- ☐ She kept the wrong sign
- ☐ She forgot the x
- ☐ Nothing — it is correct

29 Expand $4(-n + 3)$.

30 Write an expression, without brackets, for the area of a rectangle with width 5 and length $x + 4$.

- 31** Write an expression, without brackets, for the area of a rectangle with width x and length $x + 6$.

- 32** Which expression is equivalent to $3(2g + h - 7)$?

- ☐ $6g + h - 7$
☐ $6g + 3h - 21$
☐ $5g + 4h - 4$
☐ $6g + 3h - 7$

- 33** Expand and simplify $2(x + 4) + 3(x + 2)$.

- 34** Expand and simplify $5(y + 3) - 2(y + 1)$.

- 35** Expand $6(x + 2)$ and then substitute $x = 3$. What is the value?

- 36** Expand $4(2x - 1)$ and then substitute $x = 5$. What is the value?

C · Challenge — Two brackets, letters outside and reversing.

- 37** Expand and simplify $3(2a + 5) - 2(3a - 4)$.

- 38** Expand and simplify $2x(x + 3) + x(x - 1)$.

- 39** Expand and simplify $4(p + 2q) - 3(p - q)$.

- 40** A rectangle has width 3 and length $2x + 5$. A square has side x . Write a simplified expression for the total area.

- 41** Expand and simplify $5(2n - 3) - (n - 4)$.

- 42** $a(x + b)$ expands to $3x + 12$. What is the value of a ?

- 43** $a(x + b)$ expands to $3x + 12$. What is the value of b ?

- 44** Write an expression for the area of a rectangle of width $2x$ and length $x + 7$, and expand it.

D · Word problems — Expanding in context.

- 45** A box holds $x + 4$ pencils. Write an expanded expression for the number of pencils in 6 boxes.

- 46** A ticket costs \$ y and there is a \$3 booking fee per ticket. Write an expanded expression for the cost of 5 tickets.
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- 47** A rectangular flowerbed is 4 m wide and $(x + 6)$ m long. Write an expanded expression for its area, in m^2 .
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- 48** A shop reduces every item by \$2. Write an expanded expression for the cost of 7 items that originally cost \$ p each.
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- 49** A minibus carries n passengers. Three minibuses each carry 2 more than n . Write an expanded expression for the total number carried.
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- 50** A square patio has side x m. A border 2 m wide is added to the length only, making a rectangle x by $(x + 2)$. Write an expanded expression for the new area, in m^2 .
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- 51** A team scores t points a match. Over 4 matches they score 3 extra bonus points each time. Write an expanded expression for their total.
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- 52** A hall has r rows of $(s + 2)$ seats. Write an expanded expression for the total number of seats.
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- 53** A phone plan costs \$ $(m - 5)$ a month after a discount. Write an expanded expression for the cost of a year.
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- 54** A pack contains $2x + 1$ stickers. Write an expanded expression for the number in 5 packs.
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- 55** Two rectangles: one is 3 by $(x + 1)$, the other is 2 by $(x + 4)$. Write a simplified expression for their total area.
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- 56** A gardener plants 4 rows of $(n + 3)$ plants and then 2 rows of $(n - 1)$ plants. Write a simplified expression for the total.
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