

Expanding triple brackets

Starter

1. (Review of last lesson)

Find the values of a , b and c that turn these statements into identities (i.e. true for all values of x):

(a) $ax^2 + bx + c \equiv (x + 3)^2$ (b) $(ax + b)(x - 2) \equiv 2x^2 + cx - 10$

2. (Review of last lesson)

Write the '=' or the ' \equiv ' symbol in the box to make each statement mathematically correct.

(a) $x^2 + 6x + 5 \square (x + 1)(x + 5)$

(b) $x^2 + 6x + 5 \square (x + 1)(x + 4)$

3. (a) Expand and simplify $(x + 2)(x + 5)$.

(b) Hence expand and simplify $(x + 4)(x + 2)(x + 5)$.

Notes

When multiplying a bracket with two terms by a bracket with three terms, multiply the three terms by each term in the bracket with two terms.

$$(x + 2)(x^2 + 5x + 6) = x^3 + 5x^2 + 6x + 2x^2 + 10x + 12$$

$$= x^3 + 7x^2 + 16x + 12$$

Suggested success criteria – expanding triple brackets

1. Expand and simplify the last two brackets using FOIL.
2. Multiply each of these terms by the **first** term in the first bracket.
3. Multiply each of these terms by the **second** term in the first bracket.
4. Collect like terms.

E.g. 1 Expand and simplify:

(a) $(x + 1)(x + 3)(x + 4)$

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

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

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

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

(f) $(x + 4)^3$

Working: (a) $(x + 3)(x + 4) = x^2 + 4x + 3x + 12 = x^2 + 7x + 12$
 $\therefore (x + 1)(x + 3)(x + 4) = (x + 1)(x^2 + 7x + 12)$
 $= x^3 + 7x^2 + 12x + x^2 + 7x + 12$
 $= x^3 + 8x^2 + 19x + 12$

Video: [Expanding triple brackets](#)

[Solutions to Starter and E.g.s](#)

Exercise

9-1 class textbook:	p106 E4.1 Qu 1-8, 9-10*, 11-19, 20*
A*-G class textbook:	No exercise
9-1 homework book:	p37 E4.1 Qu 1-10
A*-G homework book:	No exercise

Summary

Suggested success criteria — expanding triple brackets:

1. Expand and simplify the last two brackets using FOIL.
2. Multiply each of these terms by the *first* term in the first bracket.
3. Multiply each of these terms by the *second* term in the first bracket.
4. Collect like terms.