

Algebra: Grid Method (Triple Brackets) Worksheet

Solve the following problems using the grid method to expand triple brackets. Show all your working clearly and use a grid for each question to organise your terms. Simplify your final answers fully.

1. Expand and simplify the expression $(x + 2)(x - 3)(x + 4)$ using the grid method.
2. Expand and simplify $(2x + 1)(x - 5)(x + 3)$ using the grid method.
3. Expand and simplify $(x - 2)(x + 6)(x - 1)$ using the grid method.
4. Expand and simplify $(x + 4)(x + 2)(x - 7)$ using the grid method.
5. Expand and simplify $(3x - 2)(x + 5)(x - 1)$ using the grid method.
6. Expand and simplify $(x + 1)(2x - 3)(x + 2)$ using the grid method.

Tip: For each question, start by expanding two of the brackets using the grid method, then multiply the result by the third bracket using another grid. Simplify the expression at the end.

Maths with Melissa

Answer Key

1. $(x + 2)(x - 3)(x + 4)$

First, expand $(x + 2)(x - 3) = x^2 - 3x + 2x - 6 = x^2 - x - 6$ Now multiply by $(x + 4)$:

$$(x^2 - x - 6)(x + 4) = x^3 + 4x^2 - x^2 - 4x - 6x - 24 = x^3 + 3x^2 - 10x - 24$$

Final answer: $x^3 + 3x^2 - 10x - 24$

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

First, expand $(2x + 1)(x - 5) = 2x^2 - 10x + x - 5 = 2x^2 - 9x - 5$ Now multiply by $(x + 3)$:

$$(2x^2 - 9x - 5)(x + 3) = 2x^3 + 6x^2 - 9x^2 - 27x - 5x - 15 = 2x^3 - 3x^2 - 32x - 15$$

Final answer: $2x^3 - 3x^2 - 32x - 15$

3. $(x - 2)(x + 6)(x - 1)$

First, expand $(x - 2)(x + 6) = x^2 + 6x - 2x - 12 = x^2 + 4x - 12$ Now multiply by $(x - 1)$:

$$(x^2 + 4x - 12)(x - 1) = x^3 - x^2 + 4x^2 - 4x - 12x + 12 = x^3 + 3x^2 - 16x + 12$$

Final answer: $x^3 + 3x^2 - 16x + 12$

4. $(x + 4)(x + 2)(x - 7)$

First, expand $(x + 4)(x + 2) = x^2 + 2x + 4x + 8 = x^2 + 6x + 8$ Now multiply by $(x - 7)$:

$$(x^2 + 6x + 8)(x - 7) = x^3 - 7x^2 + 6x^2 - 42x + 8x - 56 = x^3 - x^2 - 34x - 56$$

Final answer: $x^3 - x^2 - 34x - 56$

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

First, expand $(3x - 2)(x + 5) = 3x^2 + 15x - 2x - 10 = 3x^2 + 13x - 10$ Now multiply by $(x - 1)$:

$$(3x^2 + 13x - 10)(x - 1) = 3x^3 - 3x^2 + 13x^2 - 13x - 10x + 10 = 3x^3 + 10x^2 - 23x + 10$$

Final answer: $3x^3 + 10x^2 - 23x + 10$

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

First, expand $(x + 1)(2x - 3) = 2x^2 - 3x + 2x - 3 = 2x^2 - x - 3$ **Now multiply by** $(x + 2)$:

$$(2x^2 - x - 3)(x + 2) = 2x^3 + 4x^2 - x^2 - 2x - 3x - 6 = 2x^3 + 3x^2 - 5x - 6$$

Final answer: $2x^3 + 3x^2 - 5x - 6$