
EXPANDING BRACKETS

Question	Answer
1. $3(x + 2)$	$= 3 \times x + 3 \times 2$ $= \mathbf{3x + 6}$
2. $2x(x - 4)$	$= 2x \times x + 2x \times -4$ $= \mathbf{2x^2 - 8x}$
3. $7(5 - 2x)$	$= 7 \times 5 + 7 \times -2x$ $= \mathbf{35 - 14x}$
4. $(x + 2)(x + 3)$	$= x \times x + x \times 3 + 2 \times x + 2 \times 3$ $= x^2 + 3x + 2x + 6$ $= \mathbf{x^2 + 5x + 6}$
5. $(x - 4)(x + 5)$	$= x \times x + x \times 5 + -4 \times x + -4 \times 5$ $= x^2 + 5x - 4x - 20$ $= \mathbf{x^2 + x - 20}$
6. $(x - 5)(x - 2)$	$= x \times x + x \times + -2 + -5 \times x$ $\quad \quad \quad + -5 \times -2$ $= x^2 - 2x - 5x + 10$ $= \mathbf{x^2 - 7x + 10}$
7. $(2x + 3)(x + 4)$	$= 2x \times x + 2x \times 4 + 3 \times x + 3 \times 4$ $= 2x^2 + 8x + 3x + 12$ $= \mathbf{2x^2 + 11x + 12}$
8. $(3x - 2)(2x + 5)$	$= 3x \times 2x + 3x \times 5 + -2 \times 2x + -2 \times 5$ $= 6x^2 + 15x - 4x - 10$ $= \mathbf{6x^2 + 11x - 10}$
9. $(x + 1)^2$	$= (x + 1)(x + 1)$ $= x \times x + x \times 1 + 1 \times x + 1 \times 1$

	$= x^2 + x + x + 1$ $= \mathbf{x^2 + 2x + 1}$
10. $(x - 3)^2$	$= (x - 3)(x - 3)$ $= x \times x + x \times -3 + -3 \times x + -3 \times -3$ $= x^2 - 3x - 3x + 9$ $= \mathbf{x^2 - 6x + 9}$
11. $(x + 2)(x^2 - x + 3)$	$= x(x^2 - x + 3) + 2(x^2 - x + 3)$ $= x \times x^2 + x \times -x + x \times 3 + 2 \times x^2$ $\quad \quad \quad + 2 \times -x + 2 \times 3$ $= x^3 - x^2 + 3x + 2x^2 - 2x + 6$ $= \mathbf{x^3 + x^2 + x + 6}$
12. $(2x - 3)(x^2 + 4x + 5)$	$= 2x(x^2 + 4x + 5) + -3(x^2 + 4x + 5)$ $= 2x \times x^2 + 2x \times 4x + 2x \times 5 + -3 \times x^2$ $\quad \quad \quad + -3 \times 4x + -3 \times 5$ $= 2x^3 + 8x^2 + 10x - 3x^2 - 12x - 15$ $= \mathbf{2x^3 + 5x^2 - 2x - 15}$
13. $(x + 1)(x + 2)(x + 3)$	$= (x \times x + x \times 2 + 1 \times x + 1 \times 2)(x + 3)$ $= (x^2 + 2x + x + 2)(x + 3)$ $= (x^2 + 3x + 2)(x + 3)$ $= x^2(x + 3) + 3x(x + 3) + 2(x + 3)$ $= x^2 \times x + x^2 \times 3 + 3x \times x + 3x \times 3$ $\quad \quad \quad + 2 \times x + 2 \times 3$ $= x^3 + 3x^2 + 3x^2 + 9x + 2x + 6$ $= \mathbf{x^3 + 6x^2 + 11x + 6}$
14. $(x + 2)^3$	$= (x + 2)(x + 2)(x + 2)$ $= (x \times x + x \times 2 + 2 \times x + 2 \times 2)(x + 2)$ $= (x^2 + 2x + 2x + 4)(x + 2)$ $= (x^2 + 4x + 4)(x + 2)$ $= x^2(x + 2) + 4x(x + 2) + 4(x + 2)$ $= x^2 \times x + x^2 \times 2 + 4x \times x + 4x \times 2$ $\quad \quad \quad + 4 \times x + 4 \times 2$ $= x^3 + 2x^2 + 4x^2 + 8x + 4x + 8$ $= \mathbf{x^3 + 6x^2 + 12x + 8}$
15. $(x - 3)^3$	$= (x - 3)(x - 3)(x - 3)$ $= (x \times x + x \times -3 + -3 \times x$ $\quad \quad \quad + -3 \times -3)(x - 3)$ $= (x^2 - 3x - 3x + 9)(x - 3)$ $= (x^2 - 6x + 9)(x - 3)$ $= x^2(x - 3) + -6x(x - 3) + 9(x - 3)$ $= x^2 \times x + x^2 \times -3 + -6x \times x$ $\quad \quad \quad + -6x \times -3 + 9 \times x$ $\quad \quad \quad + 9 \times -3$

	$= x^3 - 3x^2 - 6x^2 + 18x + 9x - 27$ $= x^3 - \mathbf{9x^2} + \mathbf{27x} - \mathbf{27}$
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