EXPANDING BRACKETS

Answer all of these questions. Remember to show your working out in all questions.

MAIN QUESTIONS

1. Expand $2(x + 3)$ | $2x + 6$
2. Expand $5(x - 4)$ | $5x - 20$
3. Expand $-3(x + 7)$ | $-3x - 21$
4. Expand $4(2x - 5)$ | $8x - 20$
5. Expand $-2(3x + 1)$ | $-6x - 2$
6. Expand $(x + 2)(x + 3)$ | $x^2 + 5x + 6$
7. Expand $(x - 4)(x + 5)$ | $x^2 + x - 20$
8. Expand $(2x + 1)(x - 3)$ | $2x^2 - 5x - 3$
9. Expand $(3x - 2)(2x + 5)$ | $6x^2 + 11x - 10$
10. Expand $(x + 4)^2$ | $x^2 + 8x + 16$
11. Expand $(2x - 3)^2$ | $4x^2 - 12x + 9$
12. Expand $(x + 1)(x - 1)$ | $x^2 - 1$
13. Expand $(3x + 2)(3x - 2)$ | $9x^2 - 4$
14. Expand $(x + 2)(x^2 + 3x + 1)$ | $x^3 + 5x^2 + 7x + 2$
15. Expand $(2x - 1)(x^2 - 3x + 4)$ | $2x^3 - 7x^2 + 11x - 4$
16. Expand $3x(2y + 4)$ | $6xy + 12x$
17. Expand $2x(3y - 5)$ | $6xy - 10x$
18. Expand $4xy(2x + 3y)$ | $8x^2y + 12xy^2$
19. Expand $3xy(4x - 2y)$ | $12x^2y - 6xy^2$
20. Expand $2x^2y(3x + 4y)$ | $6x^3y + 8x^2y^2$

21. Expand $5xy^2(2x - 3y)$ | $10x^2y^2 - 15xy^3$

22. Expand $3x^2y(4x^2 + 2y^2)$ | $12x^4y + 6x^2y^3$

23. Expand $2xy^3(5x^3 - 3y)$ | $10x^4y^3 - 6xy^4$

24. Expand $4x^2y^2(3x^2 + 2y^2)$ | $12x^4y^2 + 8x^2y^4$

25. Expand $3x^3y(2x^2y + 4xy^2)$ | $6x^5y + 12x^4y^2$

26. Expand $5x^2y^3(3x^3 - 2y^2)$ | $15x^5y^3 - 10x^2y^5$

27. Expand $2x^4y(4x^2y^2 + 3xy^3)$ | $8x^6y^3 + 6x^5y^4$

28. Expand $3x^3y^2(5x^2y^3 - 2x^4y)$ | $15x^5y^5 - 6x^7y^3$

29. Expand $4x^2y^4(3x^3y^2 + 2x^2y^3)$ | $12x^5y^6 + 8x^4y^7$

30. Expand $2x^5y^3(4x^3y^2 - 3x^2y^4)$ | $8x^8y^5 - 6x^7y^7$

MASTER QUESTIONS

M1. A rectangle has length $(3x + 2)$ and width $(2x - 1)$. Find its area. | $6x^2 + x - 2$

M2. A square has side length $(4x + 3)$. Find its area. | $16x^2 + 24x + 9$

M3. The volume of a cuboid is given by $(2x + 1)(3x - 2)(x + 4)$. Expand this expression. | $6x^3 + 23x^2 - 6x - 8$

M4. A garden's length is $(5x + 2)$ and its width is $(3x - 1)$. If a path of width x runs around the garden, find the total area. | $15x^2 + x - 2 + 4x(4x + 1)$

M5. The area of a triangle is $\frac{1}{2}bh$. If the base is $(4x + 3)$ and height is $(2x - 1)$, find the area. | $4x^2 + x - 1.5$

M6. A box has dimensions $(x + 2)$, $(2x - 1)$, and $(3x + 4)$. Find its volume. | $6x^3 + 17x^2 + 6x - 8$

M7. The cost of x items at £(3x + 2) each and y items at £(2x - 1) each. Find the total cost.

$3x^2 + 2x + 2xy - y$

M8. A room's length is (4x + 3) and width is (3x - 2). If carpet costs £(x + 1) per square metre, find the total cost.

$12x^3 + 13x^2 - 11x - 6$

M9. The perimeter of a rectangle is 4(2x + 3) and its area is (3x - 1)(x + 2). Verify if these are consistent.

Perimeter gives length + width = $2x + 3$, area gives $3x^2 + 5x - 2$

M10. A cylindrical tank has radius (2x + 1) and height (3x - 2). Using $\pi r^2 h$, find the volume in terms of π.

$\pi(12x^3 + 4x^2 - 11x + 2)$