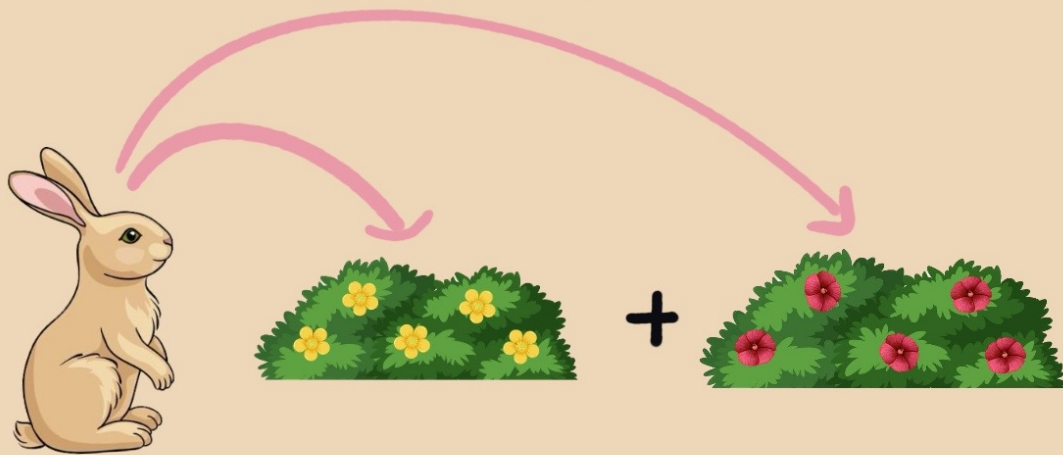


Expanding (Brackets)



Expand the brackets

$$2 (x + 8)$$

$$2x + 16$$

$$6y (9 - y)$$

$$54y - 6y^2$$

Expand the brackets and simplify

$$12 (4x + 8) - 6x$$

$$48x + 96 - 6x$$

$$42x + 96$$

$$7 (a - 11) + 2 (3 + a)$$

$$7a - 77 + 6 + 2a$$

$$9a - 71$$

1. Expand $4(y + 2)$



$$\underline{4y + 8} \dots\dots$$

(1)

2. Expand $2(h - 4)$



$$\underline{2h - 8} \dots\dots$$

(1)

3. Expand $5(2w + 3)$



$$\underline{10w + 15} \dots\dots$$

(1)

4. Expand $3(2y - 1)$



$$\underline{6y - 3} \dots\dots$$

(1)

5. Expand $5(2x + 7)$



$$\underline{10x + 35} \dots\dots$$

(1)

6. Expand $3(10 - 3y)$



$$\underline{30 - 9y} \dots\dots$$

(1)

7. Expand $6(3 - 2x)$



$$\underline{18 - 12x} \dots\dots$$

(1)

8. Expand $2(3w - 5y)$



$$\underline{6w - 10y} \dots$$

(1)

9. Expand $4(2m - 3p)$



$$\underline{8m - 12p} \dots$$

(1)

10. Multiply out $x(x + 3)$



$$\underline{x^2 + 3x} \dots$$

(1)

11. Expand $a(a - 9)$



$$\underline{a^2 - 9a} \dots$$

(1)

12. Expand $y(3y + 5)$



$$\underline{3y^2 + 5y} \dots$$

(1)

13. Expand $5y(2y + 1)$



$$\underline{10y^2 + 5y} \dots$$

(2)

14. Expand $3x(3x - 2)$



$$\underline{9x^2 - 6x} \dots$$

(2)

15. Expand $8x(2x - 5)$



$$\underline{16x^2 - 40x} \dots$$

(1)

16. Multiply out $-3(y + 2)$



$$\underline{-3y - 6} \dots\dots\dots$$

(1)

17. Expand $6x(y - 2)$



$$\underline{6xy - 12x} \dots\dots\dots$$

(2)

18. Expand $9e(2f - 3)$



$$\underline{18ef - 27e} \dots\dots\dots$$

(2)

19. Expand $-2(y - 4)$



$$\underline{-2y + 8} \dots\dots\dots$$

(1)

20. Expand and simplify $3(x + 5) + 2(x + 1)$



$$3x + 15 + 2x + 2$$
$$5x + 17$$

$$\underline{5x + 17} \dots\dots\dots$$

(2)

21. Expand and simplify $4(x - 1) + 3(2x + 5)$



$$4x - 4 + 6x + 15$$

$$\underline{10x + 11} \dots\dots\dots$$

(2)

22. Expand $y(y^2 + 3)$



$$y^3 + 3y$$

$$\underline{y^3 + 3y} \dots\dots\dots$$

(1)

23. Expand $2w(3w^2 - 5)$



$$6w^3 - 10w$$

24. Expand $y^2(8 - 2y)$



$$\frac{8y^2 - 16y^3}{(2)}$$

25. Expand $2x^2(7x + 3)$



$$\frac{14x^3 + 6x^2}{(2)}$$

26. Expand $4x^2(2x - 5)$



$$\frac{8x^3 - 20x^2}{(2)}$$

27. Expand $a(3a + 2ac)$



$$\frac{3a^2 + 2a^2c}{(1)}$$

28. Expand and simplify $7(x + 4) + 5(3 - 2x)$



$$7x + 28 + 15 - 10x$$

$$\frac{-3x + 43}{(2)}$$

29. Simplify $19w - (5 - 4w)$



$$19w - 5 + 4w$$

$$\frac{23w - 5}{(2)}$$

30. Expand and simplify $2(7y - 3x) - 8(x - 4y)$



$$14y - 6x - 8x + 32y$$

$$\frac{46y - 14x}{(2)}$$

31. Expand $w^5(w^4 + 3)$



$$\frac{w^9 + 3w^5}{(2)}$$

1 (a) Expand $7(2x + 7)$

$$\underline{14x + 49} \quad (1)$$

(b) Factorise $3y + 12$

$$\underline{3(y + 4)} \quad (1)$$

2 (a) Expand $5a(a - 6)$

$$\underline{5a^2 - 30a} \quad (2)$$

(b) Solve $4(b + 2) = 24$

$$b + 2 = 6$$
$$b = 4$$

$$b = \underline{4} \quad (2)$$

3 (a) Factorise fully $12m + 8m^2$

$$\underline{4m(3 + 2m)} \quad (2)$$

(b) Solve $3(n - 5) = 27$

$$n - 5 = 9$$

$$n = \underline{14} \quad (2)$$

4 (a) Expand $8(3s - 2)$

$$\underline{24s - 16} \quad (1)$$

(b) Factorise $4t + 20$

$$\underline{4(t + 5)} \quad (1)$$

5 (a) Factorise fully $5a^2b + 15ab^2$

$$\underline{5ab(a + 3b)} \quad (2)$$

(b) Solve $6(c - 8) = 42$

$$\begin{aligned} 6c - 48 &= 42 \\ 6c &= 90 \\ c &= \frac{90}{6} \end{aligned}$$

$$c = \underline{15} \quad (2)$$

6 (a) Factorise $18x + 24$

$$\underline{6(3x + 4)} \quad (1)$$

(b) Expand $3(2y - 4)$

$$\underline{6y - 12} \quad (1)$$

7 (a) Expand $p(p - 3)$

$$p^2 - 3p \quad \text{.....} \quad (1)$$

(b) Factorise $16q + 8$

$$8(2q + 1) \quad \text{.....} \quad (1)$$

8 (a) Factorise fully $6x^2 - 4xy$

$$2x(3x - 2y) \quad \text{.....} \quad (2)$$

(b) Solve $2(w - 4) = 13$

$$2w - 8 = 13$$

$$2w = 21$$

$$w = \frac{21}{2} = 10 \frac{1}{2}$$

$$w = 10 \frac{1}{2} \quad \text{.....} \quad (2)$$

9 (a) Factorise $x^2 - 9x$

$$x(x - 9) \quad \text{.....} \quad (1)$$

(b) Expand $6(5y + 1)$

$$30y + 6 \quad \text{.....} \quad (1)$$

10 (a) Expand $3(5x - 8)$

$$15x - 24 \quad (1)$$

(b) Factorise $18y + 15$

$$3(6y + 5) \quad (1)$$

11 (a) Expand $7(2h - 3)$

$$14h - 21 \quad (1)$$

(b) Expand and Simplify $4(g + 5) + 3(g - 2)$

$$4g + 20 + 3g - 6$$

$$7g + 14 \quad (2)$$

12 (a) Factorise fully $7xy + 21x$

$$7x(y + 3) \quad (2)$$

(b) Solve $6(p + 3) = 42$

$$p + 3 = 7$$

$$p = 4$$

$$p = 4 \quad (2)$$

13 (a) Expand $a(a + b)$

$$\underline{a^2 + ab} \quad (1)$$

(b) Factorise $15y - 6$

$$\underline{3(5y - 2)} \quad (1)$$

14 (a) Expand $9x(3y - 8)$

$$\underline{27xy - 72x} \quad (2)$$

(b) Expand and Simplify $7(t - 4) + 5(t - 2)$

$$7t - 28 + 5t - 10$$

$$\underline{12t - 38} \quad (2)$$

15 (a) Factorise fully $30x^3 + 12x$

$$\underline{6x(5x^2 + 2)} \quad (2)$$

(b) Solve $5(f - 2) = 22$

$$5f - 10 = 22$$

$$5f = 32$$

$$f = 6 \frac{2}{5}$$

$$f = \underline{6 \frac{2}{5}} \quad (2)$$

16 (a) Expand $x(8x + 1)$

$$8x^2 + x$$

(1)

(b) Factorise $18 + 63y$

$$9(2 + 7y)$$

(1)

17 (a) Expand $2x^2(4x - 9)$

$$8x^3 - 18x^2$$

(2)

(b) Expand and Simplify $6(y + 3) - 5(y - 4)$

$$6y + 18 - 5y + 20$$

$$y + 38$$

(2)

18 (a) Factorise fully $30a^2 + 40ab$

$$10a(3a + 4b)$$

(2)

(b) Solve $3(g + 9) = 21$

$$g + 9 = 7$$

$$g = -2$$

$$g = -2$$

(2)

19 (a) Expand $n(5n + 1)$

$$\underline{5n^2 + n} \quad (1)$$

(b) Factorise $18m + mn$

$$\underline{m(18 + n)} \quad (1)$$

20 (a) Expand $3x(7x^2 - y)$

$$\underline{21x^3 - 3xy} \quad (2)$$

(b) Expand and Simplify $3(6y + 5) - 2(4y - 1)$

$$18y + 15 - 8y + 2$$

$$\underline{10y + 17} \quad (2)$$

21 (a) Factorise fully $18a^2bc + 30abc^2$

$$6abc(3a + 5c)$$

$$\underline{6abc(3a + 5c)} \quad (2)$$

(b) Expand and Simplify $4(2y - 7) - 3(5y - 3)$

$$8y - 28 - 15y + 9$$

$$\underline{-7y - 19} \quad (2)$$

1 Expand and Simplify $(x+2)(x+4)(x+1)$

$$(x^2 + 4x + 2x + 8)(x+1)$$

$$(x^2 + 6x + 8)(x+1)$$

$$x^3 + 6x^2 + 8x + x^2 + 6x + 8$$

$$x^3 + 7x^2 + 14x + 8$$

2 Expand and Simplify $(x-3)(x+5)(x-2)$

$$(x^2 + 5x - 3x - 15)(x-2)$$

$$(x^2 + 2x - 15)(x-2)$$

$$x^3 + 2x^2 - 15x - 2x^2 - 4x + 30$$

$$x^3 - 19x + 30$$

$$x^3 - 19x + 30$$

3 Expand and Simplify $(x+2)(x+1)(x+5)$

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

$$(x^2 + 3x + 2)(x+5)$$

$$x^3 + 3x^2 + 2x + 5x^2 + 15x + 10$$

$$x^3 + 8x^2 + 17x + 10$$

$$x^3 + 8x^2 + 17x + 10$$

The Maths Society

4 Expand and Simplify $(x+4)(x+5)(x-4)$

$$(x^2-16)(x+5)$$
$$x^3-16x+5x^2-80$$

$$x^3+5x^2-16x-80$$

5 Expand and Simplify $(x+3)(x-1)^2$

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

$$x^3+x^2-5x+3$$

6 Expand and Simplify $(x+5)(x-3)(2x-1)$

$$(x^2-3x+5x-15)(2x-1)$$
$$(x^2+2x-15)(2x-1)$$
$$2x^3+4x^2-30x-x^2-2x+15$$

$$2x^3+3x^2-32x+15$$

7 Expand and Simplify $(2x + 1)(x + 2)(x + 3)$

$$(2x^2 + 4x + x + 2)(x + 3)$$

$$(2x^2 + 5x + 2)(x + 3)$$

$$2x^3 + 5x^2 + 2x + 6x^2 + 15x + 6$$

$$2x^3 + 11x^2 + 17x + 6$$

8 Expand and Simplify $(2x - 3)(x - 2)(3x - 1)$

$$(2x^2 - 4x - 3x + 6)(3x - 1)$$

$$(2x^2 - 7x + 6)(3x - 1)$$

$$6x^3 - 21x^2 + 18x - 2x^2 + 7x - 6$$

$$6x^3 - 23x^2 + 25x - 6$$

9 Expand and Simplify $(x - 2)(3x + 2)(x + 5)$

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

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

$$3x^3 - 4x^2 - 4x + 15x^2 - 20x - 20$$

$$3x^3 + 11x^2 - 24x - 20$$

10 Expand and Simplify $(3x + 1)(x + 2)(x - 4)$

$$\begin{aligned} & (3x^2 + 6x + x + 2)(x - 4) \\ & (3x^2 + 7x + 2)(x - 4) \\ & 3x^3 + 7x^2 + 2x - 12x^2 - 28x - 8 \\ & 3x^3 - 5x^2 - 26x - 8 \end{aligned}$$

11 Show that $(2x + 3)(5x + 2)(x - 5) = 10x^3 - 31x^2 - 89x - 30$

for all values of x .

$$\begin{aligned} & (10x^2 + 4x + 15x + 6)(x - 5) \\ & = (10x^2 + 19x + 6)(x - 5) \\ & = 10x^3 + 19x^2 + 6x - 50x^2 - 95x - 30 \\ & = 10x^3 - 31x^2 - 89x - 30 \\ & \text{(shown)} \end{aligned}$$

12 Show that $(2x - 1)(3x + 2)^2 = 18x^3 + 15x^2 - 4x - 4$

for all values of x .

$$\begin{aligned} & (9x^2 + 12x + 4)(2x - 1) \\ & = 18x^3 + 24x^2 + 8x - 9x^2 - 12x - 4 \\ & = 18x^3 + 15x^2 - 4x - 4 \text{ (shown)} \end{aligned}$$

13 Show that $(3x - 1)(4x + 3)(x - 9) = 12x^3 - 103x^2 - 48x + 27$

for all values of x .

$$\begin{aligned} & (12x^2 + 9x - 4x - 3)(x - 9) \\ &= (12x^2 + 5x - 3)(x - 9) \\ &= 12x^3 + 5x^2 - 3x - 108x^2 - 45x + 27 \\ &= 12x^3 - 103x^2 - 48x + 27 \\ & \quad \text{(shown)} \end{aligned}$$

14 Show that $(5x - 4)(3x + 1)(2x - 7) = 30x^3 - 119x^2 + 41x + 28$

for all values of x .

$$\begin{aligned} & (15x^2 + 5x - 12x - 4)(2x - 7) \\ &= (15x^2 - 7x - 4)(2x - 7) \\ &= 30x^3 - 14x^2 - 8x - 105x^2 + 49x + 28 \\ &= 30x^3 - 119x^2 + 41x + 28 \\ & \quad \text{(shown)} \end{aligned}$$

(Total for question 14 is 3 marks)