

## Exercise 1A

$$1 \text{ a } x^3 \times x^4 = x^{3+4} \\ = x^7$$

$$\text{b } 2x^3 \times 3x^2 = 2 \times 3 \times x^{3+2} \\ = 6x^5$$

$$\text{c } \frac{k^3}{k^2} = k^{3-2} \\ = k$$

$$\text{d } \frac{4p^3}{2p} = \frac{4}{2} \times \frac{p^3}{p} \\ = 2 \times p^{3-1} \\ = 2p^2$$

$$\text{e } \frac{3x^3}{3x^2} = \frac{3}{3} \times \frac{x^3}{x^2} \\ = 1 \times x^{3-2} \\ = x$$

$$\text{f } (y^2)^5 = y^{2 \times 5} \\ = y^{10}$$

$$\text{g } 10x^5 \div 2x^3 = 5x^{5-3} \\ = 5x^2$$

$$\text{h } (p^3)^2 \div p^4 = p^6 \div p^4 \\ = p^{6-4} \\ = p^2$$

$$\text{i } (2a^3)^2 \div 2a^3 = 2^2 \times a^6 \div 2a^3 \\ = 4a^6 \div 2a^3 \\ = 2a^{6-3} \\ = 2a^3$$

$$\text{j } 8p^4 \div 4p^3 = 2p^{4-3} \\ = 2p^1 \\ = 2p$$

$$\text{k } 2a^4 \times 3a^5 = 2 \times 3 \times a^4 \times a^5 \\ = 6 \times a^{4+5} \\ = 6a^9$$

$$\text{l } \frac{21a^3b^7}{7ab^4} = \frac{21}{7} \times \frac{a^3}{a} \times \frac{b^7}{b^4} \\ = 3a^{3-1} \times b^{7-4} \\ = 3a^2b^3$$

$$\text{m } 9x^2 \times 3(x^2)^3 = 9 \times 3 \times x^2 \times x^{2 \times 3} \\ = 27x^{2+6} \\ = 27x^8$$

$$\text{n } 3x^3 \times 2x^2 \times 4x^6 = 3 \times 2 \times 4 \times x^{3+2+6} \\ = 24x^{11}$$

$$\text{o } 7a^4 \times (3a^4)^2 = 7a^4 \times 9a^8 \\ = 63a^{12}$$

$$\text{p } (4y^3)^3 \div 2y^3 = 64y^9 \div 2y^3 \\ = 32y^6$$

$$\text{q } 2a^3 \div 3a^2 \times 6a^5 = 2 \div 3 \times 6 \times a^{3-2+5} \\ = 4a^6$$

$$\text{r } 3a^4 \times 2a^5 \times a^3 = 3 \times 2 \times a^{4+5+3} \\ = 6a^{12}$$

$$2 \text{ a } 9(x-2) = 9x - 18$$

$$\text{b } x(x+9) = x^2 + 9x$$

$$\text{c } -3y(4-3y) = -12y + 9y^2$$

$$\text{d } x(y+5) = xy + 5x$$

$$\text{e } -x(3x+5) = -3x^2 - 5x$$

$$\text{f } -5x(4x+1) = -20x^2 - 5x$$

$$\text{g } (4x+5)x = 4x^2 + 5x$$

$$\text{h } -3y(5-2y^2) = -15y + 6y^3$$

$$\text{i } -2x(5x-4) = -10x^2 + 8x$$

$$\text{j } (3x-5)x^2 = 3x^3 - 5x^2$$

$$\text{k } 3(x+2) + (x-7) = 3x + 6 + x - 7 \\ = 4x - 1$$

$$\text{l } 5x - 6 - (3x - 2) = 5x - 6 - 3x + 2 \\ = 2x - 4$$

$$\text{m } 4(c+3d^2) - 3(2c+d^2) \\ = 4c + 12d^2 - 6c - 3d^2 \\ = -2c + 9d^2$$

$$\begin{aligned}
 2 \quad n \quad & (r^2 + 3t^2 + 9) - (2r^2 + 3t^2 - 4) \\
 & = r^2 + 3t^2 + 9 - 2r^2 - 3t^2 + 4 \\
 & = 13 - r^2
 \end{aligned}$$

$$o \quad x(3x^2 - 2x + 5) = 3x^3 - 2x^2 + 5x$$

$$p \quad 7y^2(2 - 5y + 3y^2) = 14y^2 - 35y^3 + 21y^4$$

$$q \quad -2y^2(5 - 7y + 3y^2) = -10y^2 + 14y^3 - 6y^4$$

$$\begin{aligned}
 r \quad & 7(x - 2) + 3(x + 4) - 6(x - 2) \\
 & = 7x - 14 + 3x + 12 - 6x + 12 \\
 & = 4x + 10
 \end{aligned}$$

$$\begin{aligned}
 s \quad & 5x - 3(4 - 2x) + 6 = 5x - 12 + 6x + 6 \\
 & = 11x - 6
 \end{aligned}$$

$$\begin{aligned}
 t \quad & 3x^2 - x(3 - 4x) + 7 = 3x^2 - 3x + 4x^2 + 7 \\
 & = 7x^2 - 3x + 7
 \end{aligned}$$

$$\begin{aligned}
 u \quad & 4x(x + 3) - 2x(3x - 7) \\
 & = 4x^2 + 12x - 6x^2 + 14x \\
 & = 26x - 2x^2
 \end{aligned}$$

$$\begin{aligned}
 v \quad & 3x^2(2x + 1) - 5x^2(3x - 4) \\
 & = 6x^3 + 3x^2 - 15x^3 + 20x^2 \\
 & = 23x^2 - 9x^3
 \end{aligned}$$

$$\begin{aligned}
 3 \quad a \quad & \frac{6x^4 + 10x^6}{2x} = \frac{6x^4}{2x} + \frac{10x^6}{2x} \\
 & = 3x^{4-1} + 5x^{6-1} \\
 & = 3x^3 + 5x^5
 \end{aligned}$$

$$\begin{aligned}
 b \quad & \frac{3x^5 - x^7}{x} = \frac{3x^5}{x} - \frac{x^7}{x} \\
 & = 3x^{5-1} - x^{7-1} \\
 & = 3x^4 - x^6
 \end{aligned}$$

$$\begin{aligned}
 c \quad & \frac{2x^4 - 4x^2}{4x} = \frac{2x^4}{4x} - \frac{4x^2}{4x} \\
 & = \frac{1}{2}x^{4-1} - x^{2-1} \\
 & = \frac{x^3}{2} - x
 \end{aligned}$$

$$\begin{aligned}
 3 \quad d \quad & \frac{8x^3 + 5x}{2x} = \frac{8x^3}{2x} + \frac{5x}{2x} \\
 & = 4x^{3-1} + \frac{5}{2}x^{1-1} \\
 & = 4x^2 + \frac{5}{2}
 \end{aligned}$$

$$\begin{aligned}
 e \quad & \frac{7x^7 + 5x^2}{5x} = \frac{7x^7}{5x} + \frac{5x^2}{5x} \\
 & = \frac{7}{5}x^{7-1} + x^{2-1} \\
 & = \frac{7x^6}{5} + x
 \end{aligned}$$

$$\begin{aligned}
 f \quad & \frac{9x^5 - 5x^3}{3x} = \frac{9x^5}{3x} - \frac{5x^3}{3x} \\
 & = 3x^{5-1} - \frac{5}{3}x^{3-1} \\
 & = 3x^4 - \frac{5x^2}{3}
 \end{aligned}$$