

Algebraic methods 7A

$$\begin{aligned}
 1 \text{ a } & \frac{4x^4 + 5x^2 - 7x}{x} \\
 &= \frac{4x^4}{x} + \frac{5x^2}{x} - \frac{7x}{x} \\
 &= 4x^3 + 5x - 7
 \end{aligned}$$

$$\begin{aligned}
 \text{b } & \frac{7x^5 - 5x^5 + 9x^3 + x^2}{x} \\
 &= \frac{7x^5}{x} - \frac{5x^5}{x} + \frac{9x^3}{x} + \frac{x^2}{x} \\
 &= 7x^4 - 5x^4 + 9x^2 + x
 \end{aligned}$$

$$\begin{aligned}
 \text{c } & \frac{-x^4 + 4x^2 + 6}{x} \\
 &= \frac{-x^4}{x} + \frac{4x^2}{x} + \frac{6}{x} \\
 &= -x^3 + 4x + \frac{6}{x}
 \end{aligned}$$

$$\begin{aligned}
 \text{d } & \frac{7x^5 - x^3 - 4}{x} \\
 &= \frac{7x^5}{x} - \frac{x^3}{x} - \frac{4}{x} \\
 &= 7x^4 - x^2 - \frac{4}{x}
 \end{aligned}$$

$$\begin{aligned}
 \text{e } & \frac{8x^4 - 4x^3 + 6x}{2x} \\
 &= \frac{8x^4}{2x} - \frac{4x^3}{2x} + \frac{6x}{2x} \\
 &= 4x^3 - 2x^2 + 3
 \end{aligned}$$

$$\begin{aligned}
 \text{f } & \frac{9x^2 - 12x^3 - 3x}{3x} \\
 &= \frac{9x^2}{3x} - \frac{12x^3}{3x} - \frac{3x}{3x} \\
 &= 3x - 4x^2 - 1
 \end{aligned}$$

$$\begin{aligned}
 \text{g } & \frac{7x^3 - x^4 - 2}{5x} \\
 &= \frac{7x^3}{5x} - \frac{x^4}{5x} - \frac{2}{5x} \\
 &= \frac{7x^2}{5} - \frac{x^3}{5} - \frac{2}{5x}
 \end{aligned}$$

$$\begin{aligned}
 \text{h } & \frac{-4x^2 + 6x^4 - 2x}{-2x} \\
 &= \frac{-4x^2}{-2x} + \frac{6x^4}{-2x} - \frac{2x}{-2x} \\
 &= 2x - 3x^3 + 1
 \end{aligned}$$

$$\begin{aligned}
 \text{i } & \frac{-x^8 + 9x^4 - 4x^3 + 6}{-2x} \\
 &= -\frac{x^8}{-2x} + \frac{9x^4}{-2x} - \frac{4x^3}{-2x} + \frac{6}{-2x} \\
 &= \frac{x^7}{2} - \frac{9x^3}{2} + 2x^2 - \frac{3}{x}
 \end{aligned}$$

$$\begin{aligned}
 \text{j } & \frac{-9x^9 - 6x^6 + 4x^4 - 2}{-3x} \\
 &= \frac{-9x^9}{-3x} - \frac{6x^6}{-3x} + \frac{4x^4}{-3x} - \frac{2}{-3x} \\
 &= 3x^8 + 2x^5 - \frac{4x^3}{3} + \frac{2}{3x}
 \end{aligned}$$

$$2 \text{ a } \frac{(x+3)(x-2)}{(x-2)} = x+3$$

$$\text{b } \frac{(x+4)(3x-1)}{(3x-1)} = x+4$$

$$\begin{aligned}
 \text{c } & \frac{(x+3)^2}{(x+3)} = \frac{(x+3)(x+3)}{(x+3)} \\
 &= x+3
 \end{aligned}$$

$$\begin{aligned}
 \text{d } & \frac{x^2 + 10x + 21}{(x+3)} = \frac{(x+7)(x+3)}{(x+3)} \\
 &= x+7
 \end{aligned}$$

$$\begin{aligned}
 \text{e } & \frac{x^2 + 9x + 20}{(x+4)} = \frac{(x+4)(x+5)}{(x+4)} \\
 &= x+5
 \end{aligned}$$

$$\begin{aligned}
 \text{f } & \frac{x^2 + x - 12}{(x-3)} = \frac{(x-3)(x+4)}{(x-3)} \\
 &= x+4
 \end{aligned}$$

$$2 \text{ g } \frac{x^2 + x - 20}{x^2 + 2x - 15} = \frac{(x+5)(x-4)}{(x+5)(x-3)}$$

$$= \frac{x-4}{x-3}$$

$$2 \text{ h } \frac{x^2 + 3x + 2}{x^2 + 5x + 4} = \frac{(x+2)(x+1)}{(x+4)(x+1)}$$

$$= \frac{x+2}{x+4}$$

$$2 \text{ i } \frac{x^2 + x - 12}{x^2 - 9x + 18} = \frac{(x+4)(x-3)}{(x-6)(x-3)}$$

$$= \frac{x+4}{x-6}$$

$$2 \text{ j } \frac{2x^2 + 7x + 6}{(x-5)(x+2)} = \frac{(2x+3)(x+2)}{(x-5)(x+2)}$$

$$= \frac{2x+3}{x-5}$$

$$2 \text{ k } \frac{2x^2 + 9x - 18}{(x+6)(x+1)} = \frac{(2x-3)(x+6)}{(x+6)(x+1)}$$

$$= \frac{2x-3}{x+1}$$

$$2 \text{ l } \frac{3x^2 - 7x + 2}{(3x-1)(x+2)} = \frac{(3x-1)(x-2)}{(3x-1)(x+2)}$$

$$= \frac{x-2}{x+2}$$

$$2 \text{ m } \frac{2x^2 + 3x + 1}{x^2 - x - 2} = \frac{(2x+1)(x+1)}{(x-2)(x+1)}$$

$$= \frac{2x+1}{x-2}$$

$$2 \text{ n } \frac{x^2 + 6x + 8}{3x^2 + 7x + 2} = \frac{(x+4)(x+2)}{(3x+1)(x+2)}$$

$$= \frac{x+4}{3x+1}$$

$$2 \text{ o } \frac{2x^2 - 5x - 3}{2x^2 - 9x + 9} = \frac{(2x+1)(x-3)}{(2x-3)(x-3)}$$

$$= \frac{2x+1}{2x-3}$$

$$3 \quad 6x^3 + 3x^2 - 84x = 3x(2x^2 + x - 28)$$

$$= 3x(2x-7)(x+4)$$

$$6x^2 - 33x + 42 = 3(2x^2 - 11x + 14)$$

$$= 3(x-2)(2x-7)$$

$$\frac{6x^3 + 3x^2 - 84x}{6x^2 - 33x + 42} = \frac{3x(2x-7)(x+4)}{3(x-2)(2x-7)}$$

$$= \frac{x(x+4)}{(x-2)}$$

$$a = 1, b = 4, c = -2$$