

- 1 Given that

$$\frac{22}{(2x-3)(x+4)} \equiv \frac{A}{2x-3} + \frac{B}{x+4},$$

find the values of the constants  $A$  and  $B$ . (3)

- 2 Find the values of  $A$ ,  $B$  and  $C$  such that

$$\frac{x+5}{(x+1)(x-3)^2} \equiv \frac{A}{x+1} + \frac{B}{x-3} + \frac{C}{(x-3)^2}. \quad (4)$$

- 3 Given that

$$\frac{4x^2 - 16x - 7}{2x^2 - 9x + 4} \equiv A + \frac{B}{2x-1} + \frac{C}{x-4},$$

find the values of the constants  $A$ ,  $B$  and  $C$ . (4)

- 4  $f(x) = 3x^3 + 11x^2 + 8x - 4$ .

a Fully factorise  $f(x)$ . (4)

b Express  $\frac{x+16}{f(x)}$  in partial fractions. (4)

- 5 Given that

$$f(x) = \frac{1}{x(2x-1)^2},$$

express  $f(x)$  in partial fractions. (4)

- 6  $f(x) = \frac{x^3 + 5x^2 - 2x - 19}{x^2 + 7x + 10}$ .

Show that  $f(x)$  can be written in the form

$$f(x) = x + A + \frac{B}{x+2} + \frac{C}{x+5},$$

where  $A$ ,  $B$  and  $C$  are integers to be found. (5)

- 7 The function  $f$  is defined by

$$f(x) = \frac{4}{x^2 - 1}.$$

a Express  $f(x)$  in partial fractions. (3)

The function  $g$  is defined by

$$g(x) = \frac{2 + 5x - x^2}{(x-4)(x-2)(x-1)}.$$

b Express  $g(x)$  in partial fractions. (3)

c Hence, or otherwise, solve the equation  $f(x) = g(x)$ . (5)