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

$$\frac{x+5}{(x+1)(x-3)^2} \equiv \frac{A}{x+1} + \frac{B}{x-3} + \frac{C}{(x-3)^2}.$$ **(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 $\dfrac{x+16}{f(x)}$ 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)**