

1 Given that $\frac{x^2 - 36}{x^2 - 11x + 30} \times \frac{25 - x^2}{Ax^2 + Bx + C} \times \frac{6x^2 + 7x - 3}{3x^2 + 17x - 6} \equiv \frac{x+5}{6-x}$
 find the values of the constants A , B and C , where A , B and C are integers. **(5 marks)**

2 Express $\frac{6}{4x^2 + 8x - 5} + \frac{3x+1}{2x-1}$ as a single fraction in its simplest form. **(4 marks)**

3 Show that $\frac{6(x+7)}{(5x-1)(2x+5)}$ can be written in the form $\frac{A}{5x-1} + \frac{B}{2x+5}$
 Find the values of the constants A and B . **(5 marks)**

4 $f(x) = \frac{4x^2 + x - 23}{(x-3)(4-x)(x+5)}$, $x > 4$
 Given that $f(x)$ can be expressed in the form $\frac{A}{x-3} + \frac{B}{4-x} + \frac{C}{x+5}$
 find the values of A , B and C . **(6 marks)**

5 $\frac{18x^2 - 98x + 78}{(x-4)^2(3x+1)} = \frac{A}{x-4} + \frac{B}{(x-4)^2} + \frac{C}{3x+1}$, $x > 4$
 Find the values of the constants A , B and C . **(6 marks)**

6 $\frac{x^3 + 8x^2 - 9x + 12}{x+6} = Ax^2 + Bx + C + \frac{D}{x+6}$
 Find the values of the constants A , B , C and D . **(5 marks)**

7 $f(x) = \frac{x^4 + 2x^3 - 29x^2 - 47x + 77}{x^2 - 2x - 15}$
 Show that $f(x)$ can be written as $Px^2 + Qx + R + \frac{V}{x+3} + \frac{W}{x-5}$ and find the values of P , Q , R , V and W . **(7 marks)**

8 Find the values of the constants A, B, C, D and E in the following identity:

$$5x^4 - 4x^3 + 17x^2 - 5x + 7 \equiv (Ax^2 + Bx + C)(x^2 + 2) + Dx + E$$

(5 marks)

9 $f(x) \equiv \frac{9x^2 + 25x + 16}{9x^2 - 16}$

Show that $f(x)$ can be written in the form $A + \frac{B}{3x - 4} + \frac{C}{3x + 4}$, where A, B and C are constants to be found.

(7 marks)