

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)