Algebraic Methods- Questions

Jan 2013 Mathematics Advanced Paper 1: Pure Mathematics 4

1.

3. Express $\dfrac{9x^2 + 20x - 10}{(x+2)(3x-1)}$ in partial fractions.

(4)

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2.

1.

$$\frac{9x^2}{(x-1)^2(2x+1)} = \frac{A}{(x-1)} + \frac{B}{(x-1)^2} + \frac{C}{(2x+1)}.$$

Find the values of the constants A, B and C.

(4)

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3.

5.

$$\frac{2x^2 + 5x - 10}{(x-1)(x+2)} \equiv A + \frac{B}{x-1} + \frac{C}{x+2}.$$

(a) Find the values of the constants A, B and C.

(4)

(b) Hence, or otherwise, expand $\dfrac{2x^2 + 5x - 10}{(x-1)(x+2)}$ in ascending powers of x, as far as the term in x^2.

Give each coefficient as a simplified fraction.

(7)