St. Andrew's and St. Bride's High School

Advanced Higher Homework 1

1. (a) Expand $(x + y)^5$

   (b) Expand $(2x - 3y)^4$

   (c) Find the coefficient of x^2 in the expansion of $\left(\frac{2}{x} + 5x\right)^8$.

2. Write in a form that does not involve improper algebraic fractions:

   (a) $\frac{x^2 - 3x + 8}{x - 6}$ (b) $\frac{3x^3 + 5x^2 + 19x - 3}{x^2 + 4}$

3. Express as partial fractions:

   (a) $\frac{7x + 22}{(x + 6)(x - 4)}$ (b) $\frac{2x^2 - 11x - 29}{(x - 5)(x^2 + 9)}$

   (c) $\frac{9x^2 + 45x + 58}{(x - 1)(x + 3)^2}$ (d) $\frac{2x^3 - 12x^2 - 15x - 25}{(x - 7)(x + 1)}$