Lesson 2

Partial Fractions : Pure Year 2

2.1 The Format Of The Answer

Previously, it was shown that

$$\frac{x+5}{(x-4)(x-1)} = \frac{3}{(x-4)} - \frac{2}{(x-1)}$$

In obtaining the Right Hand Side it was necessary to have some idea as to the form of the answer.

The form of the answer is not always as obvious as you might at first think.

2.2 A Repeated Factor

Spot the pattern ....

$$\frac{x+1}{(x+3)^4} = \frac{A}{(x+3)} + \frac{B}{(x+3)^2} + \frac{C}{(x+3)^3} + \frac{D}{(x+3)^4}$$

$$\frac{x+1}{(x+3)^3} = \frac{A}{(x+3)} + \frac{B}{(x+3)^2} + \frac{C}{(x+3)^3}$$

$$\frac{x+1}{(x+3)^2} =$$

2.3 Exercise

Question 1

Write the following as partial fractions;

$$\frac{x+1}{(x+3)^2}$$

Question 2

Write the following as partial fractions;

$$\frac{2x^2 - 5x + 7}{(x - 2)(x - 1)^2}$$

Question 3

Write the following as partial fractions;

$$\frac{x^2 - 20x - 11}{(x + 1)^2 (x - 4)}$$

Question 4

C4 Examination question from June 2011, Q1.

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

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

[4 marks]

Question 5

Write the following as partial fractions;

$$\frac{2x^2 + 9x + 2}{(x + 5)^3}$$

Question 6

Write as a single fraction;

$$\frac{8}{(x+1)} + \frac{3}{(x+1)^2} + \frac{5}{(x+1)^3}$$

Question 7

Write the following as partial fractions;

$$\frac{8\,(9x-10)}{x^2(x+4)^2}$$

Puzzle (Not too hard !)

Question 8

$$\frac{17}{18} = \frac{A}{2} + \frac{B}{3} + \frac{C}{9}$$

Find the positive integer value of A, B and C.