Mini Test 01 - Algebra

Question 1:

$$f(x) = -4x^3 + 16x^2 - 13x + 3$$

(a) Use the factor theorem to show that $(x - 3)$ is a factor of $f(x)$.

[2]

(b) Hence, fully factorise $f(x)$.

[4]

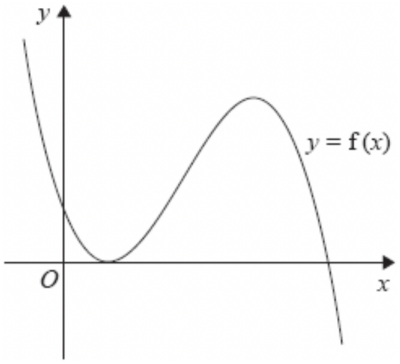

Figure 1

Figure 1 shows a sketch of part of the curve with equation $y = f(x)$.

(c) Use your answer to part (b) and the sketch to deduce the set of values of x for which $f(x) \leq 0$.

[2]

Question 2:

(a) Write 4^{2x+1} in the form 2^a, where a is an expression in x.

[1]

(b) Hence solve, without using a calculator, the equation

$$2^x \times 4^{2x+1} = 16^{3x}$$

[4]

Question 3:

The curve C_1 has equation $y = f(x)$ where

$$f(x) = (x^2 - 4)(x - 3)$$

Sketch a graph of C_1 showing clearly the coordinates of each point where the curve crosses the coordinate axes.

[3]