Stationary Points : 1

(Past Paper Questions)

(129) The curve C has equation

$$y = x^3 + 3x^2 - 9x - 13.$$

(a) Find the stationary points of C and determine the nature of each of these points. [6]

(b) Sketch C, indicating the coordinates of the stationary points. [2]

(c) State, giving a reason, the number of real roots of the equation

$$x^3 + 3x^2 - 9x - 13 = 0.$$ [2]

Jan 09

(130) The curve C has equation

$$y = x^3 - 3x^2 + 3x + 5.$$

(a) Show that C has only one stationary point. Find the coordinates of this point. [4]

(b) Verify that this stationary point is a point of inflection. [2]

June 09

(131) The curve C has equation

$$y = x^3 - 6x^2 + 20.$$

(a) Find the coordinates and the nature of each of the stationary points of C. [6]

(b) Sketch C, indicating the coordinates of each of the stationary points. [2]

(c) Given that the equation

$$x^3 - 6x^2 + 20 = k$$

has three distinct real roots, find the range of possible values for k. [2]

Jan 10

(132) The curve C has equation

$$y = \frac{1}{2}x^3 - 6x + 3.$$

Find the coordinates and the nature of each of the stationary points of C. [6]

June 10