

**Problem : 0580/43/M/J/23/Q9B(II)**

Calculate the  $x$ -values of the turning points of  $y = 9 + 9x - x^2 - x^3$ .  
Show all your working and give your answers correct to 2 decimal places.

$$\underline{\text{Sol}} \quad \frac{dy}{dx} = 0 + 9 - 2x - 3x^2$$

$$\frac{dy}{dx} = 0$$

$$9 - 2x - 3x^2 = 0$$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \times (-3) \times 9}}{2 \times -3}$$

$$x = 1.43 \quad x = -2.10$$