

Problem : 0580/41/O/N/22/ Q10B

Find the coordinates of the two stationary points on the graph of $y = x^6 - 6x^5$.
You must show all your working.

Sol

$$y = x^6 - 6x^5$$

$$\frac{d}{dx} x^n = nx^{n-1}$$

$$\begin{aligned} \frac{dy}{dx} &= 6x^5 - 6 \times 5 \times x^4 \\ &= 6x^5 - 30x^4 \end{aligned}$$

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

$$6x^5 - 30x^4 = 0$$

$$6x^4(x - 5) = 0$$

$$x = 0$$

$$x = 5$$

$$y = 0$$

$$\begin{aligned} y &= (5)^6 - 6(5)^5 \\ &= -3125 \end{aligned}$$

$$(0, 0) \quad (5, -3125)$$