

**22nd November**

Corbettmaths

Factorise fully

$$18xy^4z - 24x^2y^2z^2 + 12x^3y^3z$$

$$= \underline{6xy^2z(3y^2 - 4xz + 2x^2y)}$$

$$y = 2x^3 - 9x^2 + 12x - 9$$

Work out  $\frac{dy}{dx}$ 

$$\underline{\frac{dy}{dx} = 6x^2 - 18x + 12}$$

Hence, work out the coordinates of the stationary points of

$$y = 2x^3 - 9x^2 + 12x - 9$$

$$\begin{aligned} \text{At SPs } 6x^2 - 18x + 12 &= 0 \\ \Rightarrow x^2 - 3x + 2 &= 0 \\ \Rightarrow (x-1)(x-2) &= 0 \\ \Rightarrow x=1 \quad x=2 \\ \underline{(1, -4)} \quad \underline{(2, -5)} \end{aligned}$$

$$\begin{pmatrix} 2 & y \\ x & -12 \end{pmatrix} \begin{pmatrix} x \\ 2 \end{pmatrix} = \begin{pmatrix} 7 \\ 5x \end{pmatrix}$$

Work out the possible values for x and y

$$\begin{aligned} 2x + 2y &= 7 \\ x^2 - 24 &= 5x \\ \Rightarrow x^2 - 5x - 24 &= 0 \\ \Rightarrow (x+3)(x-8) &= 0 \\ \Rightarrow x = -3 \quad y = \frac{13}{2} \\ \underline{x = 8 \quad y = -\frac{9}{2}} \end{aligned}$$