

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

$$\text{at t.p. } \frac{dy}{dx} = 0.$$

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

$$\text{at t.p. } \frac{dy}{dx} = 0$$

$$\text{so } 0 = 6x^2 - 18x + 12$$

$$0 = x^2 - 3x + 2 \\ = (x-2)(x-1).$$

at turning point  $\Rightarrow x = 1$

$$y = 2 \cdot 1^3 - 9 \cdot 1^2 + 12 \cdot 1 \\ = 5$$

$(1, 5).$

$$\frac{d^2y}{dx^2} = 12x - 18$$

$$\text{put in } x=1 \quad \frac{dy}{dx} = -6 \quad \text{-ve} \quad \therefore \text{max.}$$

$$x = 2 \quad y = 2 \cdot 2^3 - 9 \cdot 2^2 + 12 \cdot 2 \\ = 4.$$

$(2, 4).$

$$\frac{d^2y}{dx^2} = 6 \quad \text{+ve} \quad \therefore \text{min.}$$

$(1, 5)$  max

$(2, 4)$  min.