

Q1) (a)

(iii)  $y = 3x^{3/2} + \frac{3}{x^2} - 6x$

$$\frac{d}{dx} \left( 3x^{3/2} + \frac{3}{x^2} - 6x \right)$$

Apply:  $(f \pm g)' = f' \pm g'$   $\frac{3}{x^2}$

$$= \frac{d}{dx} (3x^{3/2}) + \frac{d}{dx} (x^{-2}) - \frac{d}{dx} (6x)$$

$$\frac{d}{dx} (3x^{3/2}) = \frac{9x^{1/2}}{2}$$

$$\frac{d}{dx} \left( \frac{3}{x^2} \right) = \frac{6}{x^3}$$

$$\frac{d}{dx} (6x) = 6$$

$$= \frac{9x^{1/2}}{2} - \frac{6}{x^3} - 6$$

Combine the two fractions:  $\frac{9x^{1/2}}{2} - \frac{6}{x^3} = \frac{9x^{1/2} - 12}{2x^3}$

$$= \underline{\underline{\frac{9x^{1/2} - 12}{2x^3} - 6}}$$