

$\frac{d^2x}{dy^2}$ equals :

[2011]

(a) $-\left(\frac{d^2y}{dx^2}\right)^{-1} \left(\frac{dy}{dx}\right)^{-3}$

(b) $\left(\frac{d^2y}{dx^2}\right) \left(\frac{dy}{dx}\right)^{-2}$

(c) $-\left(\frac{d^2y}{dx^2}\right) \left(\frac{dy}{dx}\right)^{-3}$

(d) $\left(\frac{d^2y}{dx^2}\right)^{-1}$

(c) $\frac{d^2x}{dy^2} = \frac{d}{dy} \left(\frac{dx}{dy} \right) = \frac{d}{dx} \left(\frac{dx}{dy} \right) \frac{dx}{dy}$

$$= \frac{d}{dx} \left(\frac{1}{dy/dx} \right) \frac{dx}{dy} = -\frac{1}{\left(\frac{dy}{dx}\right)^2} \cdot \frac{d^2y}{dx^2} \cdot \frac{1}{\frac{dy}{dx}} = -\frac{1}{\left(\frac{dy}{dx}\right)^3} \frac{d^2y}{dx^2}$$