

Parameters with Second Derivatives

In each case find $\frac{d^2y}{dx^2}$

① $x = \frac{1}{t}$ $y = 3t^2 + 2$

② $x = t + 3$ $y = t^3 - 6t$

③ $x = 3 - 2t^2$ $y = \frac{1}{t}$

④ $x = t^2 + 2t$ $y = t^3 - 3t$

⑤ $x = at^3$ $y = at^4$

⑥ $x = 2t$ $y = e^t$

⑦ $x = \ln t$ $y = t^2$

⑧ $x = \sin t$ $y = \cos t$

⑨ $x = \tan t$ $y = \sin t$

⑩ $x = \ln t$ $y = 3t^4 - 2t$

⑪ In the following find $\frac{d^2y}{dx^2}$ for the given t or θ value

$x = t - 2$ $y = t^3 + 3$ $t = 1$

⑫ $x = t + 1$ $y = 2t^2 - 5$ $t = 3$

⑬ $x = a \sin \theta$ $y = 3a \cos \theta$ $\theta = \pi/3$