

Parametric Differentiation Worksheet: Solutions

1. (a) $\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}} = \frac{2t}{\cos t}$.

(b) $\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}} = \frac{\cos t}{-\sin t} = -\cot t$.

(c) $\frac{dy}{dx} = \frac{-\sin t}{2t \cos(t^2)}$

(d) $\frac{dy}{dx} = \frac{e^t}{2t}$

(e) $\frac{dy}{dx} = \frac{2t}{\cos t}$

2. $\frac{dy}{dx} = \frac{1+2t}{1-2t}$; $\frac{d^2y}{dx^2} = \frac{4}{(1-2t)^3}$.

3. $\frac{dy}{dx} = -\tan t$; $\frac{d^2y}{dx^2} = -\sec^3 t$.

4. $\frac{dy}{dx} = 2te^{t^2-t+1}$; $\frac{d^2y}{dx^2} = (4t^2 - 2t + 2)e^{t^2-2t+1}$.