

Math 2215 - Calculus 1

Quiz #6 - 2011.02.16

Solutions

Compute the following derivatives (you do not have to simplify):

1. $\frac{d}{dx} \sqrt{\sin(f(x))}$

$$\begin{aligned} \frac{d}{dx} \sqrt{\sin(f(x))} &= \frac{1}{2} \frac{1}{\sqrt{\sin(f(x))}} \frac{d}{dx} \sin(f(x)) \\ &= \frac{1}{2} \frac{1}{\sqrt{\sin(f(x))}} \cos(f(x)) f'(x) \end{aligned}$$

2. $\frac{d}{dt} \cos\left(\frac{f(t^2)}{2g(t)+3}\right)$

$$\begin{aligned} \frac{d}{dt} \cos\left(\frac{f(t^2)}{2g(t)+3}\right) &= -\sin\left(\frac{f(t^2)}{2g(t)+3}\right) \frac{d}{dt} \left[\frac{f(t^2)}{2g(t)+3} \right] \\ &= -\sin\left(\frac{f(t^2)}{2g(t)+3}\right) \frac{\left(\frac{d}{dt} f(t^2)\right) (2g(t)+3) - f(t^2) \frac{d}{dt} (2g(t)+3)}{(2g(t)+3)^2} \\ &= -\sin\left(\frac{f(t^2)}{2g(t)+3}\right) \frac{f'(t^2) \cdot 2t \cdot (2g(t)+3) - f(t^2) \cdot 2g'(t)}{(2g(t)+3)^2} \end{aligned}$$