

Math 2215 - Calculus 1

Quiz #11 - 2017.09.21

Solutions

Compute the following derivative:

$$\begin{aligned}\frac{d}{dx} \left[(\sin^5(3x-1) + 1)^3 \tan^3(3x+1) \right] &= \left[\frac{d}{dx} (\sin^5(3x-1) + 1)^3 \right] \cdot \tan^3(3x+1) \\ &\quad + (\sin^5(3x-1) + 1)^3 \cdot \frac{d}{dx} \tan^3(3x+1) \\ &= \left[3 (\sin^5(3x-1) + 1)^2 \frac{d}{dx} (\sin^5(3x-1) + 1) \right] \cdot \tan^3(3x+1) \\ &\quad + (\sin^5(3x-1) + 1)^3 \cdot 3 \tan^2(3x+1) \frac{d}{dx} \tan(3x+1) \\ &= \left[3 (\sin^5(3x-1) + 1)^2 \cdot 5 \sin^4(3x-1) \frac{d}{dx} \sin(3x-1) \right] \cdot \tan^3(3x+1) \\ &\quad + (\sin^5(3x-1) + 1)^3 \cdot 3 \tan^2(3x+1) \sec^2(3x+1) \frac{d}{dx} (3x+1) \\ &= \left[3 (\sin^5(3x-1) + 1)^2 \cdot 5 \sin^4(3x-1) \cos(3x-1) \cdot 3 \right] \cdot \tan^3(3x+1) \\ &\quad + (\sin^5(3x-1) + 1)^3 \cdot 3 \tan^2(3x+1) \sec^2(3x+1) \cdot 3\end{aligned}$$