Name:

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Quiz 14 🛞

MATH 200 October 8, 2024

1. Use logarithmic differentiation to find the derivative of y = $ln|y| = ln \left| \frac{\chi^8(\sin(x))^3}{\cos(x)^2} \right|$ ln/y/= ln/x8/+ ln/(sin(x))3/- ln/cos(x)2/ luly 1= 8lu(x)+ 1 lu|sin(x) 1- x lu|cos(x) Dx[m/yl]=Dx[8m/xl+3m/sin(x)]-xm/cos(x)] $\frac{y'}{y} = \frac{8}{x} + \frac{1}{3} \frac{\cos(x)}{\sin(x)} - 1 \ln|\cos(x)| - x \frac{(-\sin(x))}{\cos(x)}$ $y'=y\left(\frac{8}{x}+\frac{1}{3}\cot(x)-\ln(\cos(x))+x+\tan(x)\right)$

$$y' = \frac{x^8 \sqrt{\sin(x)}}{\cos(x)^{\alpha}} \left(\frac{8}{x} + \frac{1}{3} \cot(x) - \ln|\cos(x)| + x \tan(x) \right)$$

1. Use logarithmic differentiation to find the derivative of $y = \frac{\cos(x)^x}{x^8 \sqrt[3]{\sin(x)}} = \frac{\cos(x)^x}{x^8 \sqrt[3]{\sin(x)}}$ $ln |y| = ln \left| \frac{\cos(x)^{2}}{x^{8} (\sin(x))^{3}} \right|$ ln/y/= ln/cos(x)x/-ln/x8(sin(x))3/ x ln | cos(x) | - (ln | x8 | + ln | (sin(x)) 3 () ln/y/= xln/cos(x)/-8ln/x/- \frac{1}{3}ln/sin(x)/ $D_{x}[\ln|y|] = D_{x}|x\ln|\cos(\alpha)| - 8\ln|x| - \frac{1}{3}\ln|\sin(x)|$ $\frac{3}{u} = 1 \cdot \ln|\cos(x)| + \frac{-\sin(x)}{\cos(x)} - 8\frac{1}{x} - \frac{1}{3} \cdot \frac{\cos(x)}{\sin(x)}$ $y'=y\left(\ln|\cos(x)|-x\tan(x)-\frac{8}{x}-\frac{1}{3}\cot(x)\right)$

$$y' = \frac{\cos(x)}{x^8} \left(\ln|\cos(x)| - x + \sin(x) - \frac{8}{x} - \frac{1}{3} \cot(x) \right)$$