

Math 1210 CBE 3 Review

UtahStateUniversity®

Problem 1

- Find $f'(0)$ for the following function:

$$f(x) = \frac{2 \tan^{-1}(x)}{\cos(x)}$$

Find $f'(0)$ for the following function: $f(x) = \frac{2 \tan^{-1}(x)}{\cos(x)}$

Solution: 2

Problem 2

Find the derivative of the following function: $f(x) = -3 \tan^{-1}(2e^{4x})$.

Solution: $\frac{-24e^{4x}}{1+4e^{8x}}$

Problem 3

- Find $f'(0)$ for the following function:

$$f(x) = \sqrt[4]{x^5 + 2x + e^x}$$

Find $f'(0)$ for the following function: $f(x) = \sqrt[4]{x^5 + 2x + e^x}$

Solution: $\frac{3}{4}$

Problem 4

- Find $f' \left(\sqrt{\frac{1}{2}} \right)$ for the following function:

$$f(x) = 2 \sin \left(3x^2 - \frac{3}{2} \right)$$

Find $f'\left(\sqrt{\frac{1}{2}}\right)$ for the following function: $f(x) = 2 \sin\left(3x^2 - \frac{3}{2}\right)$

Solution: $12\sqrt{\frac{1}{2}}$

Problem 5

- Find $f'(x)$ for the following function:

$$f(x) = \frac{1}{3} \sin^{-1}(2x)$$

Solution: $\frac{2}{3\sqrt{1-4x^2}}$

Problem 6

- Find $\frac{dy}{dx}$ for $\frac{y}{x} - 2x + 5y = 0$.

$$\frac{y}{x} - 2x + 5y = 0$$

Solution: $\frac{dy}{dx} = \frac{2x^2 + y}{5x^2 + x}$

Problem 7

- Find the slope of the tangent line at $\left(\frac{\pi}{3}, \frac{\pi}{6}\right)$ for the following equation:

$$6 \sin(y) - 3 \cos(x) = \frac{3}{2}$$

Find the slope of the tangent line at $\left(\frac{\pi}{3}, \frac{\pi}{6}\right)$ for $6 \sin(y) - 3 \cos(x) = \frac{3}{2}$

Solution: $-\frac{1}{2}$

Problem 8

- Find $f'(x)$ for $f(x) = \ln\left(\frac{e^{3x}}{2x+5}\right)$.

Find $f'(x)$ for $f(x) = \ln\left(\frac{e^{3x}}{2x+5}\right)$

Solution: $f'(x) = \frac{6x+13}{2x+5}$

Problem 9

- Find $f'(x)$ for $f(x) = e^{3x \sin(x)} \ln(2x)$

Solution: $3e^{3x \sin x}(\sin x + x \cos x)(\ln(2x)) + \frac{e^{3x \sin x}}{x}$

Problem 10

- Find the derivative of the following function:

$$f(t) = (4t + 5)^{2t}$$

Find the derivative of the following function: $f(t) = (4t + 5)^{2t}$

Solution: $f'(t) = 2(4t + 5)^{2t} \left(\ln(4t + 5) + \frac{4t}{4t+5} \right)$

Problem 11

- Find $f'(x)$ for $f(x) = (x^2 - 4x + 1)^{3x}$.

Find $f'(x)$ for $f(x) = (x^2 - 4x + 1)^{3x}$

Solution: $f'(x) = (x^2 - 4x + 1)^{3x} \left(3 \ln(x^2 - 4x + 1) + \frac{6x^2 - 12x}{x^2 - 4x + 1} \right)$

Other Resources

Aggie Math Learning Center

- Visit usu.edu/math/amlc for more videos, resources, tutoring times, and recitation leader office hours

