MAC2311 Class Number 15498
QUIZ 5
2/14/2019

Name: SOLUTIONS

1. Calculate the derivative:

$$\frac{d}{dx} 3e^{(x-2)}$$

REWRITE

$$= \frac{d}{dx}\left(3e^{x}e^{-2}\right) = \frac{d}{dx}\left(3e^{-2}e^{x}\right) = 3e^{-2}e^{x} = \boxed{3e^{x-2}}$$

CONSTANT CONSTANT

2. Calculate the derivative:

$$\frac{d}{dx}\left(\frac{x^3-4}{x^5}\right)$$

$$= \frac{d}{dx}\left(\frac{x^3}{x^5} - \frac{4}{x^5}\right) = \frac{d}{dx}\left(x^{3-5} - 4x^{-5}\right)$$

$$= \frac{d}{dx}\left(x^{-2} - 4x^{-5}\right)$$

$$= -2x^{-2-1} - 4(-5)x^{-5-1} = -2x^{-3} + 20x^{-6}$$

$$= \boxed{\frac{-2}{x^3} + \frac{20}{x^6}}$$

3. Compute the first and second derivatives for

$$f(x) = -4\cos(x) + 2\sin(x)$$

$* \frac{d}{dx}\cos(x) = -\sin(x)$

$\frac{d}{dx}\sin(x) = \cos(x)$

$$f'(x) = -(-4\sin(x)) + 2\cos(x)$$

$$\boxed{f'(x) = 4\sin(x) + 2\cos(x)}$$

$$\boxed{f''(x) = 4\cos(x) - 2\sin(x)}$$