MAC2311 Class Number 15534
QUIZ 5
2/14/2019

Name: SOLUTIONS

1. Calculate the derivative:

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

REWRITE

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

CONSTANT CONSTANT

2. Calculate the derivative:

$$\frac{d}{dx}\left(\frac{x^2-3}{x^7}\right)$$

$= \frac{d}{dx}\left(\frac{x^2}{x^7} - \frac{3}{x^7}\right)$

$= \frac{d}{dx}\left(x^{2-7} - 3x^{-7}\right)$

$= \frac{d}{dx}\left(x^{-5} - 3x^{-7}\right) = -5x^{-5-1} - 3(-7)x^{-7-1}$

$= -5x^{-6} + 21x^{-8} = \boxed{\frac{-5}{x^6} + \frac{21}{x^8}}$

3. Compute the first and second derivatives for

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

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

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

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

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

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