

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH101 - Section 17 (Term 151)

Date: November 01, 2015

Quiz 4

Duration: 20 minutes

Family Name: _____ ID #: _____ Serial #: _____

1. Find the derivative of the function:

$$f(x) = (2x + 1)^5(x^3 - x + 1)^4$$

at $x = -1$.

(4 points)



2. Find the values of a and b such that the function:

$$f(x) = \begin{cases} a(2x + 1)^3 + 3b & \text{if } x \leq -2 \\ 19 - x^2 & \text{if } x > -2 \end{cases}$$

is differentiable at $x = -2$.

(5 points)



3. Find an equation to the line that is normal to the curve:

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

at the point $P(0, 1)$.

(5 points)



4. Find all points at which $f(x)$ has horizontal(s) and vertical(s) **tangents**, if:

$$f(x) = (x^3 + 3x^2 - 9x)^{\frac{1}{3}}$$

(6 points)



KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH101 - Section 26 (Term 151)

Date: November 01, 2015

Quiz 4

Duration: 20 minutes

Family Name: _____ ID #: _____ Serial #: _____

1. Let:

$$f(x) = 2^{\sin 3x} (x^3 - 4x + 8)^3$$

Find $f'(0)$.

(5 points)



2. Let:

$$f(x) = \sin^2 x - \tan x$$

Find $f''\left(\frac{\pi}{3}\right)$.

(5 points)



3. If $f'(x)$ is a continuous function and $f'(-2) = 3$, find:

$$\lim_{h \rightarrow 0} \frac{f(11h - 2) - f(3h - 2)}{h}$$

(5 points)



4. Find an equation to the line that is normal to the curve:

$$f(x) = \frac{e^{-x}}{1 + x^3}$$

at the point $P(0, 1)$.

(5 points)

