KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH101 - Section 05 (Term 141)

Date: December 21, 2014 **Quiz 5** Duration: 20 minutes

Family Name: **ID #:** __ __ __ __ __ __ __ __ __ **Serial #:** __ __

1. Evaluate the limit:

$$\lim_{x \to 0} (1 - \sin x)^{\frac{1}{x}}$$

(5 points)

2. Evaluate the definite integral:

$$\int \left(\frac{\sin x - x \cot x}{x \sin x} \right) \cdot dx$$

(5 points)

3. Newton's method is used to find the positive fourth root of 2 by solving the equation $x^4 = 2$. Start with $x_0 = 1$, find $x_2 - x_1$. **(5 points)**

4. Find a positive number for which the sum of its reciprocal and four times its square is the smallest possible.

(5 points)

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH101 - Section 19 (Term 141)

Date: December 21, 2014 **Quiz 5** Duration: 20 minutes

Family Name: **ID #:** __ __ __ __ __ __ __ __ __ **Serial #:** __ __

1. Evaluate the limit:

$$\lim_{x \to 0} \frac{\sin 3x - 3x - x^2}{1 - \cos 2x}$$

(5 points)

2. Evaluate the definite integral:

$$\int \left(\frac{1}{1 + 9x^2} + 3^{-2x} \right) \cdot dx$$

(5 points)

3. Newton's method is used to estimate the x-coordinate of the intersection point of the curves $y = x^3 - 4x$ and $y = 1 - 3x$. Start with $x_0 = 1$, find x_1. **(5 points)**

4. Find a positive number for which the sum of its reciprocal and four times its square is the smallest possible.

(5 points)

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH101 - Section 28 (Term 141)

Date: December 21, 2014 **Quiz 5** Duration: 20 minutes

Family Name: **ID #:** __ __ __ __ __ __ __ __ __ **Serial #:** __ __

1. Evaluate the limit:

$$\lim_{x \to 0} \frac{3^{4x} - 1}{x}$$

(5 points)

2. Evaluate the definite integral:

$$\int (\cot^2 x + e^{-2x}) \cdot dx$$

(5 points)

3. Newton's method is used to estimate the x-coordinate of the point the point where the curve of $y = x^3 + 2x$ crosses the horizontal line $y = 2$. Start with $x_0 = 1$, find x_1. **(5 points)**

4. What is the smallest perimeter possible for a rectangle whose area is $16\ cm^2$ and what are its dimensions? **(5 points)**