

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH102 - Section 18 (Term 152)

Date: February 2, 2016

Quiz 1

Duration: 30 minutes

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

1. Estimate the area under the graph of $f(x) = (1 + x)^{-2}$ from $x = -1$ to $x = 3$ using 4 rectangles and taking the sample points to be midpoints. **(5 points)**

2. Express and evaluate the following limit as a definite integral on the interval $[0, 1]$.

$$\lim_{n \rightarrow \infty} R_n = \lim_{n \rightarrow \infty} \sum_{i=1}^n \frac{1}{\sqrt{n^2 - i^2}}$$

(6 points)

3. Evaluate:

$$(a) \int \frac{\sec t + \tan t}{\cos t} dt$$

$$(b) \int_{\ln 1}^{3\pi} \frac{x^3 - 2\sqrt{x}}{x} dx$$

$$(c) \frac{d}{dx} \int_1^{\ln x} 2^t dt$$

(3 + 3 + 3 = 9 points)

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH102 - Section 26 (Term 152)

Date: February 2, 2016

Quiz 1

Duration: 30 minutes

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

1. Suppose the function $f(x)$ is defined as follows:

$$f(x) = \int_1^x \frac{4 + t^2}{t^3} dt, \quad x \geq 1$$

Find the following:

(a) $f(3)$

(b) $f'(2)$

(c) $f''(1)$

(4 + 2 + 3 = 9 points)

2. Express the integral:

$$\int_1^{10} (x - 4 \ln x) dx$$

as a limit of Riemann sums ($\lim_{n \rightarrow \infty} R_n$). Do not evaluate the limit. **(5 points)**

3. Find the value of the following sum:

$$\sum_3^{10} (i^3 - 2i^2 + 8i - 9)$$

(6 points)