

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH101 - Section 17 (Term 151)

Date: December 15, 2015

Quiz 7

Duration: 30 minutes

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

1. Let:

$$f(x) = \frac{x^2 + 4}{2x}$$

(a) Prove that $f''(x) = 4/x^3$

(b) Define the domain and find all critical points of $f(x)$.

(c) Describe where the function $f(x)$ increases or decreases and where it concaves upward or downward.

(d) Find all horizontal, vertical and slant asymptotes (if exist) of $f(x)$.



(e) Sketch the graph of $f(x)$.

(5 + 3 + 5 + 4 + 3 = 20 points)

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH101 - Section 26 (Term 151)

Date: December 15, 2015

Quiz 7

Duration: 30 minutes

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

1. Let:

$$f(x) = x^4 - 4x^3 + 10, \quad \text{where } 0 \leq x \leq 4$$

(a) Find $f(4) - f(0)$



(b) Find $f''(4) + f'(1)$



(c) What are the **absolute** minimum and **absolute** maximum of the function $f(x)$ in the interval $[0, 4]$.



(d) Find the value of $0 < c < 4$ that satisfy the conclusion of the Mean Value Theorem (MVT).



(e) Describe where the function $f(x)$ concaves upward or downward in the interval $[0, 4]$.

(f) Sketch the graph of $f(x)$ in the interval $[0, 4]$.

(3 + 3 + 3 + 4 + 4 + 3 = 20 points)