

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH101 - Sections 02 & 04 (Term 153)

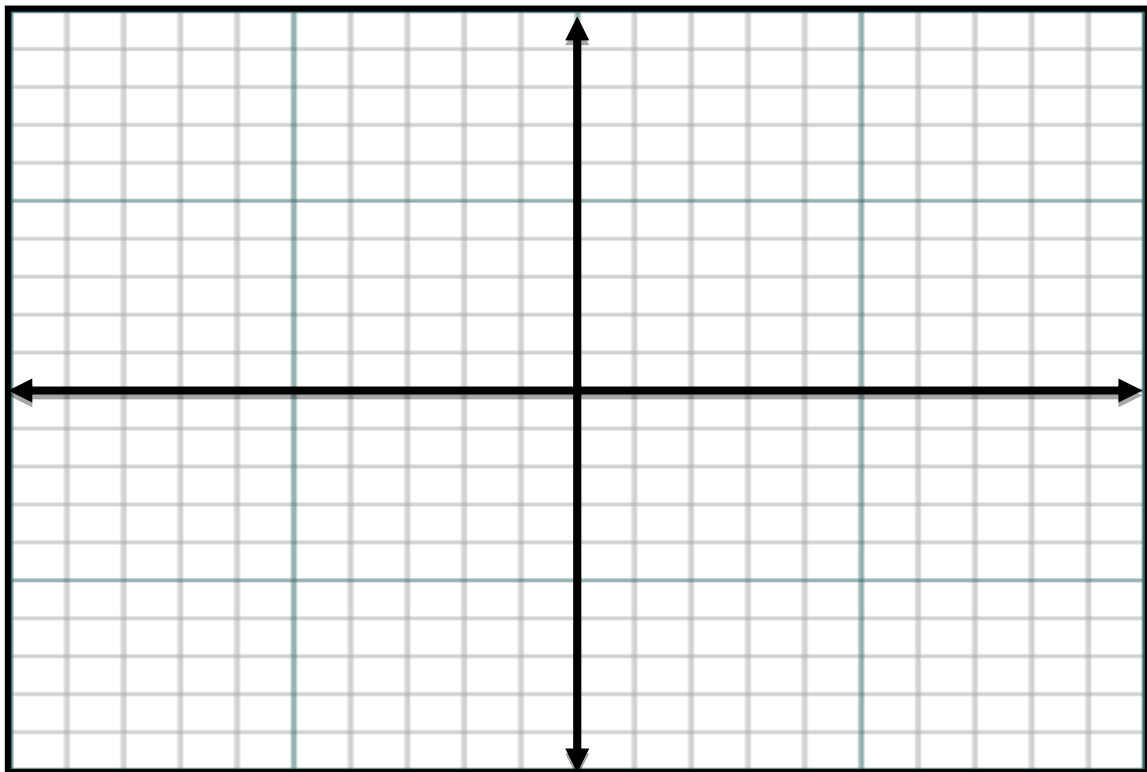
Date: July 26, 2016

Quiz 3

Duration: 30 minutes

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

1. Sketch the graph of an example of a function $f(x)$ that satisfy the following conditions:
- (a) $f(0) = f(5) = -2$ and $f(-5) = f(3) = 0$
 - (b) $\lim_{x \rightarrow 5} f(x) = -1$, $\lim_{x \rightarrow 1^-} f(x) = 3$ and $\lim_{x \rightarrow 4} f(x) = -3$
 - (c) $\lim_{x \rightarrow -\infty} f(x) = -3$ and $\lim_{x \rightarrow \infty} f(x) = -\infty$
 - (d) $f(x)$ has a jump discontinuity at $x = -1$.
 - (e) $f(x)$ has a vertical asymptote at $x = 1$.



(2 + 3 + 2 + 1 + 1 = 9 points)

2. Let $y = f(x) = 2x^2 - 3x + 5$

(a) Find the average rate of change of y with respect to x over the interval $[0, 5]$.

(b) Using limits, show that the first derivative is given by $f'(x) = 4x - 3$.

(c) Find an equation to the line that is tangent to the curve $f(x)$ at the point $P(2, 7)$.

(d) Find the instantaneous rate of change of y with respect to x at $x = \pi$.

(2 + 5 + 2 + 2 = 11 points)