MATH 160 Fall 2015 Exam I SCORE (on next page)

Date_____Name_____

Math 160 APPLIED CALCULUS EXAM I

Show all work. Do not begin until told to do so.

SCORE_____

1. Factor the following:

$$x^2 + 3x - 10$$

[5 points]

2. Given the function:

$$f(x) = \begin{cases} 2 & \text{when } x < 0\\ x^2 - 1 & \text{when } 0 \le x < 3\\ -x & \text{when } x \ge 3 \end{cases}$$

(a) Find
$$f(3)$$
.

[5 points]

(b) Find
$$f(-5) + f(6)$$
.

[5 points]

(c) Find 4f(0).

3. Find the domain of $f(x) = \sqrt{3-x}$.

[5 points]

4. Given the function:

$$g(x) = \begin{cases} x+5 & \text{when } x < 0\\ 4 & \text{when } x = 0\\ 5-x & \text{when } x > 0 \end{cases}$$

(a) Find
$$\lim_{x \to 0^-} g(x)$$
 [5 points]

(b) Find
$$\lim_{x \to 0^+} g(x)$$

[5 points]

(c) Find $\lim_{x \to 0} g(x)$

5. The revenue for FunTime Dude Ranch in Texas is given by the function $f(x) = -0.01x^2 + 30x$, where x is the dollar amount spent on advertising. The amount spent by FunTime on advertising at time $t \ge 1$ is given by g(t) = 4t - 4 dollars

(a) Find
$$(f \circ g)(t)$$
.

[5 points]

(b) Explain what f(g(t)) represents.

[5 points]

6. Express the following interval in interval notation and graph it on the real line. $\{x \mid 2 < x \le 6\}$

7.	Let	f(x)	$=2x^2$	and	g(x)	=3x	c - 1.	Find	each	of the	following:
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(a) $f(1) + g(1)$	[3 points]
(b) $f(0) - g(0)$	[3 points]
(c) $f(1) \cdot g(1)$	[3 points]
(d) $\frac{f(0)}{g(0)}$	[3 points]
(e) $f(g(2))$	[3 points]

8. Evaluate the following limit:

$$\lim_{x \to 3} 2x^2 - 6x + \frac{8}{x}$$
[5 points]

9. Evaluate the following limit:

$$\lim_{x \to \infty} \frac{3x^2 + 2x + 4}{2x^2 - 3x + 1}$$

[5 points]

10. Rationalize the denominator of the following expression:

$$\frac{1}{\sqrt{x}-2}$$

11. Evaluate the following limit:

$$\lim_{x \to 2} \frac{x^2 + 2x - 8}{x - 2}.$$

[5 points]

12. Given $f(x) = 6x^2 + 1$, find and simplify $\frac{f(x+h) - f(x)}{h}$ (Assume $h \neq 0$.) [5 points] 13. Using a chart of values, graph the function $f(x) = -x^2 + 4$, using $-2 \le x \le 2$. [5 points]