Name:_____ **11/2/2016**
Math 190-EF **Exam 2**

Directions Answer all questions in the space provided. Show all work and box your final answers. Answers with no work shown will not receive full credit. Good luck!

1. (8 points) Two fishing boats depart a harbor at the same time, one traveling east, the other north. The eastbound boat travels at a speed 7 mi/h faster than the northbound boat. After 3 h the boats are 39 mi apart. Find the speed of the northbound boat.

2. Consider the three points $P(3, -5)$, $Q(-2, 7)$, and $R(1, -1)$.

(a) (4 points) Find the distance between P and Q.

(b) (4 points) Find the slope of the line through P and Q.

(c) (4 points) Give an equation for the line that passes through R and is perpendicular to the line through P and Q.

3. (8 points) Find the center and radius of the circle described by the following equation.

$$x^2 + y^2 + 10x - 4y + 28 = 0$$

4. (a) (4 points) Give an equation for the horizontal line through $(-11, 8)$.

(b) (4 points) Give an equation for the vertical line through $(-11, 8)$.

5. (4 points) Condisder the following piecewise-defined function.

$$g(x) = \begin{cases} 2x - 3 & \text{if } x < -1 \\ -x^2 & \text{if } -1 \leq x < 2 \\ \frac{1}{2}x + 4 & \text{if } 2 \leq x \end{cases}$$

Find the values of $g(-2)$, $g(-1)$, $g(0)$, $g(2)$, and $g(3)$.

6. (8 points) Let $f(x) = 5x^2 - 4x + 2$. Find and simplify the difference quotient $\dfrac{f(a+h) - f(a)}{h}$.