Name:_____ **Section**:_____

Instructions. This is a take-home quiz, to be collected on April 1, 2010. Write out your solutions on separate sheets of paper. Staple your write-up, using this quiz as a cover page.

Problem 1. Solve the following equation graphically in the interval $[-2, 4]$, correct to two decimals.

$$2x - \sqrt{x+2} = 0.$$

Problem 2. Find an equation of the line that satisfies the given conditions:

x-intercept: -7; y-intercept: -2

Problem 3. The manager of a cheesecake factory finds that it costs \$230 to bake 100 cheesecakes in one day and \$430 to bake 400 cheesecakes in one day. Assuming that the relationship between cost and the number of cheesecakes baked is linear, find an equation that expresses this relationship. Then graph the equation.

Problem 4. Let $f(x) = x^3 - 4x^2$. Compute the following:

$$f(0), f(3), f(-3), f(\sqrt{3}), f(x+2), f(-x), f(x^2), f\left(\frac{x}{3}\right), 2f(x)$$

Problem 5. Find the domain of the following function

$$g(x) = \sqrt{9 - x^2} + \frac{x}{\sqrt{2 - x}}$$

Problem 6. Sketch the following piecewise-defined function

$$f(x) = \begin{cases} -x^2 & \text{if } |x| \leq 1 \\ -1 & \text{if } |x| > 1 \end{cases}$$

Problem 7. Determine the average rate of change of the function between the given values of the variable.

$$f(x) = 3 - 2x^2; \qquad x = -1, x = 4$$

Problem 8. Explain how the graph of g is obtained from the graph of f.

$$f(x) = x^2, \qquad g(x) = 3(x-2)^2 + 3$$

Problem 9. Find the vertex, x-intercept, and y-intercept of the following function

$$f(x) = 3x^2 + 6x - 4$$

Problem 10. Find the local maximum and minimum values of the function and the value of x at which each occurs.

$$f(x) = x\sqrt{4 - x}$$