Name: _____ **Math 1030 Quiz #4** (July 25th, 2013)

You may **skip ONE** of the following problems.

1. Jane runs the best BBQ restaurant in town. But this requires a lot of napkins. Jane needs about 250 cases of napkins each year. She can purchase a case for \$50. It costs her \$2 per case per year to store them (base inventory costs on average inventory making all of the standard assumptions). Also, it costs \$10 to place an order from her napkin supplier. Let $C(x)$ be the annual cost function.

   $C(x) =$ _____

   List **ALL** of the critical points of $C(x)$ including "irrelevant" critical points (points outside the domain of reasonable x values). Round each to 3 decimal places.

   Critical points: $x =$ _____

   Jane's **ideal** EOQ is $x =$ _____ and minimum annual cost is $C(x) = \$$_____.

2. Let $f(x) = \begin{cases} -2x^2 + 3x + 7 & x < 3 \\ x^2 + x - 10 & x \geq 3 \end{cases}$ Sketch the graph of $y = f(x)$ where $-3 \leq x \leq 6$.

   $f(x)$ has _____ critical points. They are located at $x =$ _____.
   [List **all** critical points. Round to 3 decimal places.]

   Example of a piecewise function In ALPHA: The absolute value function can be defined piecewise as

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   piecewise[{{x, x >= 0}, {-x, x < 0}}]
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3. When Jim charges \$2 per drink he usually sells 25 drinks in a day. On the other hand, if Jim charges \$1.50 he usually sells 65 drinks in a day.

   Given this data, Elasticity E = _____.

   If Jim's point elasticity is "$\varepsilon = 1.327$" when he charges \$1.75, should Jim raise or lower his price to increase his revenue? Or has Jim already maximized his revenue? [Circle the correct answer.]

   ## Raise Prices   /   Lower Prices   /   Has Maximized Revenue