Math 1030 Workshop #6 **Name:** _____

DUE: Thursday, July 30st Please turn in a paper copy and **SHOW YOUR WORK!**

1. Apple has rolled out its latest product…the iPen. The local iStore has collected the following iData about their iProduct's demand:

iPens Sold	15	100	200	350
Price	\$1,000	\$225	\$100	\$50

(a) Compute elasticity (round to 3 decimals places):

iPens Sold	15	100	200	350
Price	\$1,000	\$225	\$100	\$50
Elasticity				× × × ×

(b) Model this demand price (in Excel) using an **power** trendline.

$p_d(q) =$ _____

According to this model, the store will sell _____ iPens if they set their price at \$75.

When $p_d(q) = \$75$, our point elasticity (using this model) is $\varepsilon =$ _____ (round to 3 decimal places).

Circle the correct answer: The store is currently charging \$75 for an iPen and wants to **increase** its revenue, they should raise / lower their price.

~~What quantity and price will **maximize** revenue? $q =$ _____ $p =$ _____~~
[There is **no maximum** for the corresponding revenue function!]

2. Suppose that some items point elasticity is $\varepsilon = 1.5$ at some price. If the price is lowered by 5%, …

the quantity is lowered / raised by _____

and revenue is lowered / raised by _____.
[Both answers should be percentages rounded to 3 decimal places.]

3. Kyle is painting a very odd wall. Its height varies quite a lot. He needs to estimate the square footage of the wall so he can figure out how much paint to buy. Suppose that the wall is 30 feet long. Let x be the number of feet from the start of the wall and y be the height (in feet) of the wall as measured by Kyle…

$x =$	0	3	6	9	12	15	18	21	24	27	30
$y =$	5	7	8	7	10	9	6	5	4	6	7

Approximate the area of this wall in 2 different ways: (1) Using a right hand rule approximation with $n = 10$ rectangles and (2) Using Simpson's rule with $n = 10$. [Round each answer to 4 decimal places.]

Right hand rule: _____ Simpson's rule: _____

4. Suppose that $R(t) = (t + 0.5)^3 e^{-t}$ models the construction rate of micro-houses (in millions of houses built per year). t is the number of years since January 1, 2015.

   When (after the initial peak) will the construction rate drop to 10,000 houses per year? $t =$ _____
   [Round to 3 decimal places.]

   How many micro-houses will be built after January 1, 2025? _____.

   When will the 5,000,000$^{\text{th}}$ micro-house be completed? _____.
   [Give the month and year.]

   Alpha Commands used / integrals computed:

5. After surveying the residents of Raccoon City, we have found that the lifespan of an average citizen is 35 years with a standard deviation of 3. Assume that these lifespans are normally distributed.

   What percentage of residents live between 20 and 40 years? _____
   [Answer in the form: XXX.XXX%]

   If Raccoon City has 10,000,000 residents, how many live more than 50 years? _____

   What is the cut-off determining the 10% with the shortest lifespans? _____
   [Round to 3 decimal places.]

   Alpha Commands used / integrals computed: