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

DUE: Monday, August 1st

Please turn in a paper copy and **SHOW YOUR WORK!**

1. Slimy Stan sells bootleg Koalas smuggled in from Australia (don't ask how it's done). Stan has collected the following Koala demand and price data:

Koalas Sold	10	75	150	300
Price	\$3,000	\$1,500	\$1,000	\$425

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

Koalas Sold	10	75	150	300
Price	\$3,000	\$1,500	\$1,000	\$425
Elasticity				× × × ×

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

$p_d(q) =$ _____

According to this model, Stan will sell _____ Koalas if he sets his price at \$700.

When $p_d(q) = \$700$, our point elasticity (using this model) is $\varepsilon =$ _____ (round to 3 decimal places).

Circle the correct answer: Stan is currently charging \$700 for a Koala and wants to **increase** his revenue, he should raise / lower his price.

What quantity and price will **maximize** revenue? $q =$ _____ $p =$ _____

2. Suppose that some item's point elasticity is $\varepsilon = 0.7$ at some price. If the quantity is lowered by 7%, ...

the price is lowered / raised by _____

and revenue is lowered / raised by _____.

[Both answers should be percentages rounded to 3 decimal places.]

3. George is renting some cheap space downtown. His storage room is quite oddly shaped and he wants to figure out its square footage. Starting at the the edge of his room George measures how wide the room is using a tape measure. He steps 2 feet over each time he makes a measurement. This is what he found...

Feet from edge:	0	2	4	6	8	10	12	14	16	18	20
Room width:	15	17	18	16	16	17	19	17	17	16	15

Approximate the room's square footage 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 3 decimal places.]

Right hand rule: _____ Simpson's rule: _____

4. Suppose that $R(t) = 1000t^2e^{-t/5}$ models the rate of production of kitchen grease powered cars where t is the number of years since January 1, 2000.

   When (after the peak production) will the production rate drop to 10 grease cars per year? $t =$ _____
   [Round to 3 decimal places.]

   The maximum production rate will be _____ grease cars per year. This will occur when $t =$ _____.

   How many grease cars will be produced after January 1, 2017? _____.

   When will the 100,000$^{\text{th}}$ grease car be completed? _____.
   [Give the month and year.]

   ALPHA Commands used / integrals computed:

5. Stacy has a rather impressive collection of shoes (not all of which even fit her feet). She has about 3,000 pairs of shoes. Assuming that her collection of shoes has a normal distribution of sizes (with a mean size of 8.5 and a standard deviation of 1.25), answer the following questions:

   Note: Women's shoe sizes go up by $1/2 = 0.5$. Although there is a difference of opinion about this, consider 4 to be the smallest size. This means that the interval: $-\infty < t \leq 4.25$ represents the smallest size 4 and then $4.25 < t < 4.75$ represents size 4.5 etc.

   How may pairs of shoe sizes 8 to 11 does she have? _____

   How many shoes size 6 and under does she own? _____

   How large does a pair of shoes need to be to make it into the largest 3.5% of her collection? _____

   ALPHA Commands used / integrals computed: