## Workshop #6 (Due: Wednesday, August $5^{\text{th}}$)

**Instructions:** Email me your Excel and Maple work. Please name your files "LASTNAME_FIRSTNAME_WS6.xls" and "LASTNAME_FIRSTNAME_WS6.mw"

$$\text{Normal Distribution :} \qquad n(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{1}{2\sigma^2}(x-\mu)^2}$$

1. We recorded the following demand data:

| Price | \$90 | \$50 | \$25 | \$10 |
|---|---|---|---|---|
| Quantity | 5 | 15 | 36 | 80 |

   (a) (In Excel) Enter this data, add a row entitled "Elasticity", and compute elasticity. Add one more row entitled "Revenue" and compute it.

   (b) Is dropping the price from \$25 to \$10 a good idea? Explain why or why not. Also, explain what the elasticity is telling you.

   (c) Re-enter the data with "Quantity" listed above "Price". Graph the data and add a "Power" trendline. This our predicted demand function.

   (d) Use your predicted demand function to find the point elasticity when the price is set at \$25 (You may want to do this in Maple).

2. Bob wonders how much water his swimming pool holds. It is a rectangular pool which is 20 feet long and 10 feet wide. Using a tape measure, Bob found the following data about the depth of his pool:

| Distance from end in feet | 0 | 5 | 10 | 15 | 20 |
|---|---|---|---|---|---|
| Depth of the pool in feet | 2 | 2.5 | 4 | 5 | 4 |

   Estimate the volume of water Bob's pool holds (measured in cubic feet).

3. *Una Via* released their first album "Bad Irish Poetry" on January 1, 2005. The album's sales rate seems to be characterized by the function $S(t) = 3t^2(t-10)^2 e^{-t^2/200}$ where $S(t)$ represents sales rate (number of albums sold per year) $t$ years after it release. [For example: $S(1) = 241.7880325$ so after 1 year the album is selling at a rate of about 242 albums per year.]

   (a) Plot (in Maple) the sales rate $S(t)$ for the first 60 years.

   (b) When is the album's sales rate maximized? (I want the month and year – e.g March, 2025.)

   (c) How many albums will be sold this year (January 1, 2009 to December 31, 2009)?

   (d) How many albums will be sold overall?

   (e) When will all but the last 1,000 albums be sold? (I want the month and year – e.g March, 2025.)