Pre Calculus

Date:

Items Needed: .Book,

Objective: The students will be able to evaluate, graph, and recognize exponential functions.

PA Common Core: cc.2.2.hs.c.3, cc.2.2.hs.c.5

Lesson:

- The last two chapters we've been dealing with algebraic functions which include polynomial and rational functions. Now we are going to start to look at transcendental functions which include exponential and logarithmic functions.
- What is an exponential function? Think back to algebra when you did this function: $A = P(1+\frac{r}{n})^{nt}$ which is nothing more the equation that will give the amount of money you have accumulated after *t* years given *n* periods (quarterly, semi-annually, monthly). This is an example of an exponential function.
- A basic exponential function is $f(x) = a^x$, where a>0, a can't equal 1, and x is any real number.
- Look at example c and d on p. 180 and remind students how to raise a number to a fraction.

- Graph $f(x) = 4^x$ and $f(x) = 4^{-x}$ (y-axis reflection)and point out what the graph looks like and discuss how the only difference is one is increasing and one is decreasing.

- Look at the Library of Parent function - Exponential

- Keeping $f(x) = 4^x$ active graph $f(x) = 4^{x+1}$. (Shifts to the left)
- Keeping $f(x) = 4^x$ active graph $f(x) = 4^x - 3$. (Shifts down)
- Keeping $f(x) = 4^x$ active graph $f(x) = -4^x$. (X-axis reflection)

- Most convenient choice for a base is the natural exponential function (e) where is a constant that is approximately = 2.71828.
- Point out e on the calculator and try example 6.

- Talk about the continuous compounding formula $A = Pe^{rt}$.
- Look at example 8 and 9. Compare continuous compounding with daily compounding.
- Do example 10 and 11 for more practical applications.

Assignment: .Have students do 5-8, 17-20, 21,25,26,28,29,30, 33-36, determine transformations for 45-51(odd), 67, 77 (just what is highlighted), 80, 81, 82, p. 189

Evaluation: (Could be from any one/several of the following)

Responses from classroom questions
Results of classroom sample problems
Homework responses
Check answer with Calculator
End of the section exam

Enrichment: