Name_____
Date_____

Advanced Algebra
Unit 3: Exponential, Log, and Power Function
Assignment #1 **www.washburngulliford.weebly.com**

I can solve an exponential equation.
Description: We are continuing to grow with out algebraic manipulation and solving skills with this learning target. (**There should be a lot of repeat with Unit 1 concepts)**

An exponential equation has the variable as the exponent. So an exponential equation looks like $18=3*2^x$. The 2 in this case is called the base. The base is always being raised to some exponent. You will use your algebraic skills that you already have to ISOLATE the base. Once you ISOLATE the base you can use your calculator to find out which x value makes your statement true.

So lets put those notes all together now.... $18=3*2^x$ I can divide both sides by 3 to get $6=2^x$. Now I have the Base ISOLATED. I can go to my y= in the calculator and put in 2^x and search for when does $2^x = 6$? We should all see that x=

Lets try this example together:

$28=3+8^x$ Subtract 3 from both sides
$25=8^x$ Now I can enter 8^x into my calculator
$x=1.54$

You solve the following exponential equations. Remember to ISOLATE your base with your normal algebraic equation skills and then you can use your calculator. As the unit progresses we will learn other methods to solve an exponential equation other than just looking at your table. However, having the table method is a good strategy to be able to fall back on.
Solve the following exponential equations.

1) $350= 2*6^x$

$6^x = 175$ $\quad x = \frac{\log 175}{\log 6} = 2.9$

2) $87= 28+ 4^x$

$4^x = 59$ $\quad x = \frac{\log 59}{\log 4} = 2.9$

3) $126 = -32+5^x$

$5^x = 158$ $\quad x = \frac{\log 158}{\log 5} = 3.14$

4) $192= 14(2^x)$

$2^x = \frac{192}{14}$ $\quad x = \frac{\log\left(\frac{192}{14}\right)}{\log 2} = 3.8$

5) $205 = 105+4^x$

$4^x = 100$

$x = \frac{\log 100}{\log 4} = 3.3$

6) $1005 = 180+9^x$

$9^x = 825$

$x = \frac{\log 825}{\log 9}$ 3.1

7) $1632=\frac{14+8^x}{20}$ $8^x = 32626$ $x=4.99$

8) $2025=\frac{13+28^x}{4}$ $28^x = 8087$

9) $328= 7^x$

$x = \frac{\log 328}{\log 7} = 2.98$

9) $1926= 32-16^x$

$16^x = 1894$

$x=2.72$

10) $8=8*2^x$ $2^x=1$ $x=0$

11) $36= 18+9 * 2^x$

$2^x = 2$

$x=1$

14) $550 = 125(1+.02)^x$

$1.02^x = 4.4$ $x=74.8$

I can model real life situations with exponential equations. This is a return of a major learning target in Unit 1: $y= U_0*r^x$ But just as we learning in Unit 1 a lot of times we need to do (1+r) if it is an interest type problem or (1-r) if it is a depreciation problem.

Foundational Problems:

15) You buy a car for $14,000. The car depreciates 6% every year. How many years will it take the car to be worth around $5,600?

16) You deposit $2,000 into a bank account that earns 6% interest every year. After how many years will the account be worth $3,600?

17) You buy your dream boat for $55,000. The boat unfortunately depreciates 7% every year. After how many years will the boat be worth $32,600?

Moderate:

18) You deposit $500 into an account that earns 6% APR compounded quarterly. After how many years will the account be worth $3,700?

19) You deposit $2,000 into an account that earns 7% APR compounded monthly. After how many years will the account be worth $4,200?