Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Unit 3 – Exponential and Logarithmic Functions**

**Activity – Expansion, Factorization, and Solving**

**1.**

1. Graph the following function.

 $y=x^{\frac{1}{2}}\left(x^{\frac{3}{2}}+2x^{\frac{1}{2}}+3x^{-\frac{1}{2}}\right)$

1. Simplify the function using exponential rules.
2. Rewrite the original function using radicand

instead of fractional exponents.

1. State the domain and range of the function. Explain why this is.

2. Use the following function to answer the questions below. $y=\left(2^{x}+3\right)\left(2^{x}-3\right)$

1.  What form is the equation and what information can you get from it?
2. How can you find the *y*-intercept?
3. Graph the function.

3. Use the following function to answer the questions below. $y=3^{n+2}+3^{n}$



1. Find the *x*-intercepts by factoring.
2. Find the *y*-intercept.
3. Graph the function.

4. Use the following function to answer the questions below. $y=4^{x}-2^{x}-20$

1.  Find the *x*-intercepts by factoring.
2. Find the *y*-intercept.
3. Graph the function.

5. Solve the following functions without a calculator.

1.  $2^{x}=8$



1. $\left(\frac{1}{3}\right)^{x+2}=9$
2. $49^{x}+1=2\left(7\right)^{x}$