

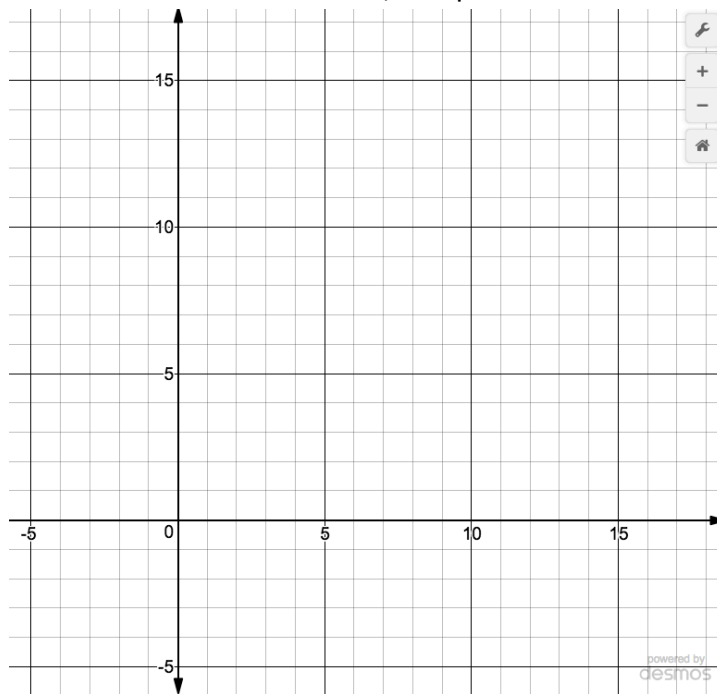
Date: _____

Unit 12: Exponents and Logarithms

Exponential function

$$y = 2^x$$

1. This is an exponential function, base _____ .
2. Fill the table of values for $f(x)$ below.
 - a. Remember to take positive AND negative values of x .
3. Plot the function on the graph. Check your plot with a graphing calculator (or desmos)
4. Now, fill the table for the inverse function, and plot it. Plot also the line $y = x$.



$f(x)$

x	y

Domain: _____

Range: _____

$f^{-1}(x)$

In	Out

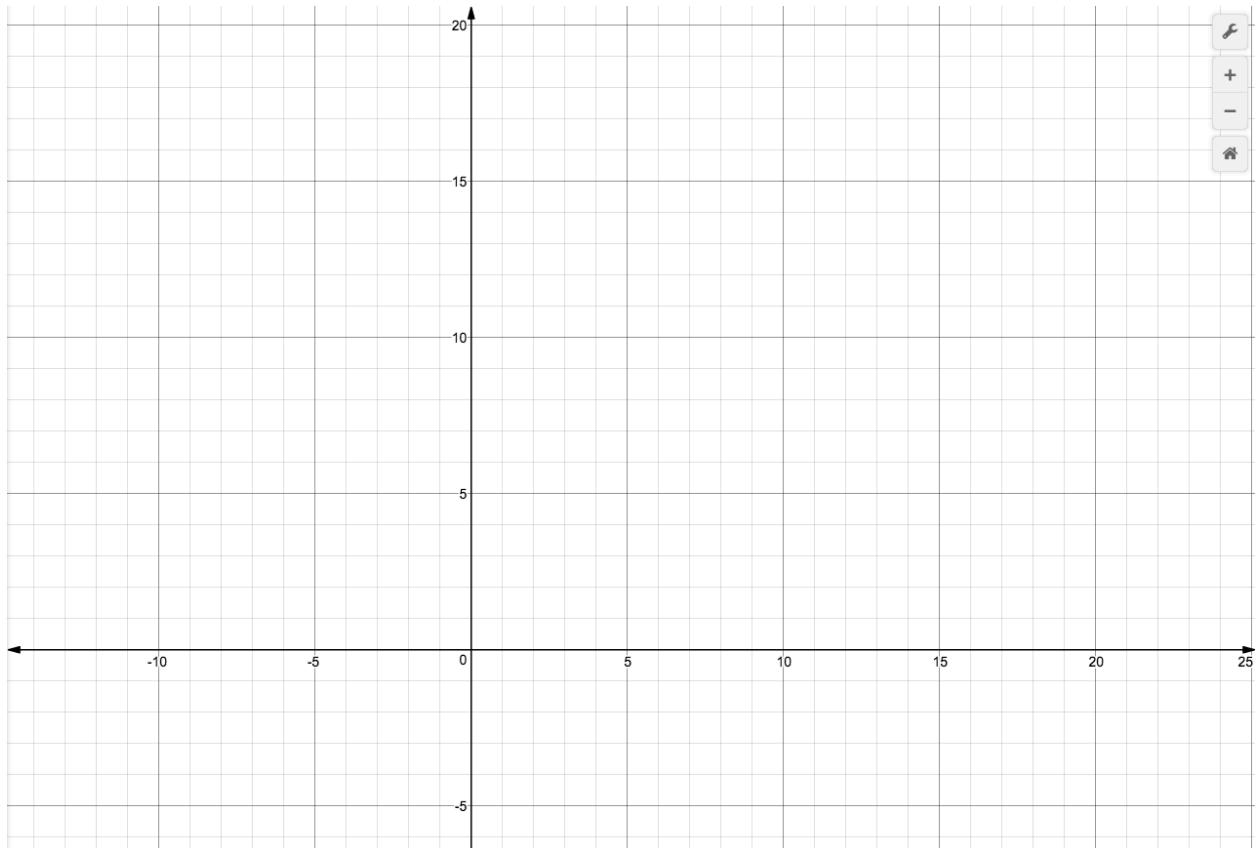
Domain: _____

Range: _____

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Exponential functions

1. Plot on your device the functions $y = 2^x$, $y = 3^x$, and $y = 4^x$, and their inverses: $y = \log_2 x$, $y = \log_3 x$, and $y = \log_4 x$.
2. Plot these graphs quantitatively below, and clearly indicate the different functions.



What is the point common to ALL exponential functions graph? _____

Explain:

Domain: _____ Range: _____

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What is the point common to ALL logarithmic functions graph? _____

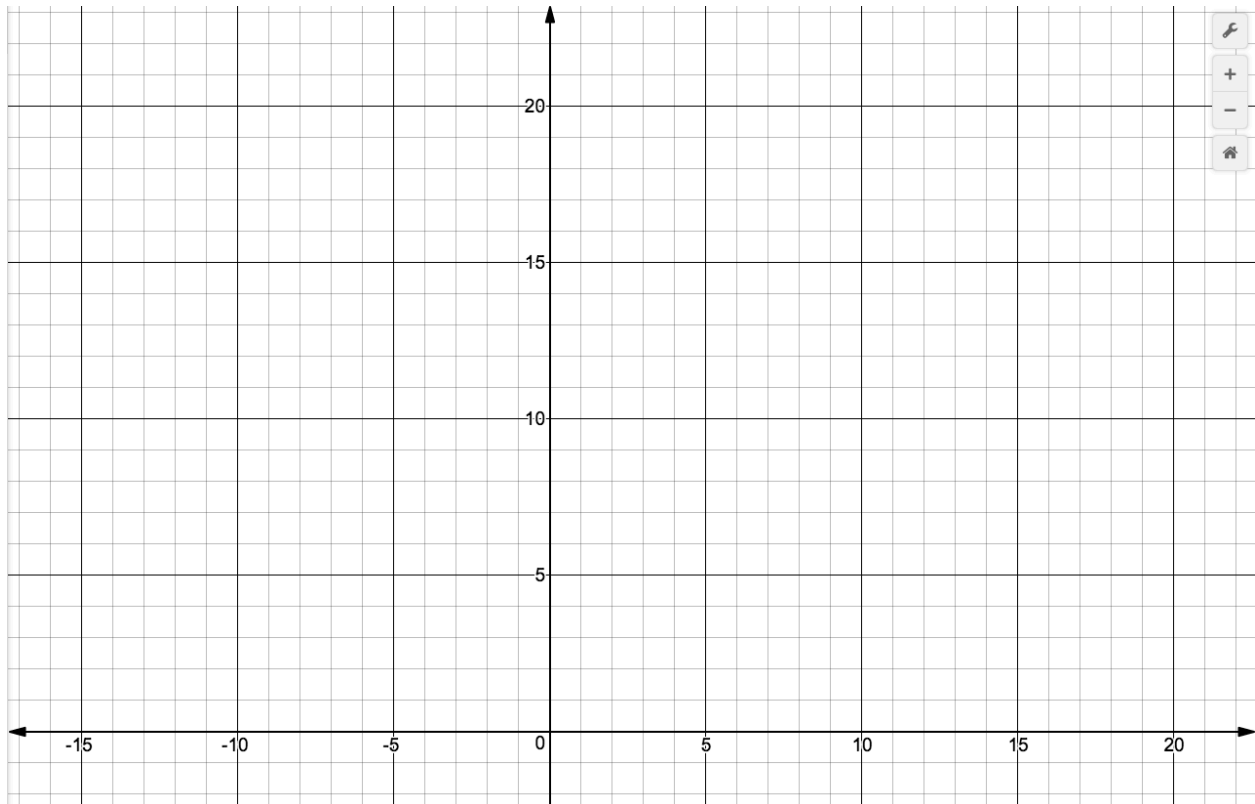
Explain:

Domain: _____ Range: _____

Date: _____

Exponential growth and Exponential decay

1. Plot the functions $y = 2^x$ and $y = \left(\frac{1}{2}\right)^x$.



Do these function still go through the point you identified before as common?

Domain: _____ Range: _____

Date: _____

Solve:

1. $8 = 2^x \rightarrow x = \underline{\hspace{2cm}}$

2. $x = \log_2 16 \rightarrow x = \underline{\hspace{2cm}}$

3. $x = \log_3 81 \rightarrow x = \underline{\hspace{2cm}}$

4. $x = \log_{10}(10) \rightarrow x = \underline{\hspace{2cm}}$

5. $x = \log_{10}(100) \rightarrow x = \underline{\hspace{2cm}}$

6. $x = \log_{10}(1000) \rightarrow x = \underline{\hspace{2cm}}$

7. $x = \log_2 \left(\frac{1}{4}\right) \rightarrow x = \underline{\hspace{2cm}}$

8. $x = \log_{10}(0.1) \rightarrow x = \underline{\hspace{2cm}}$

9. $4 = \log_2(x) \rightarrow x = \underline{\hspace{2cm}}$

10. $x = \log_2(32) \rightarrow x = \underline{\hspace{2cm}}$

11. $6 = \log_{10}(x) \rightarrow x = \underline{\hspace{2cm}}$

12. What does 2^π mean? What does it equal to (from the graphs you plotted)?

13. Recall that exponential function is defined for $y = a^x$ where $a > 0$ and $a \neq 1$.

a. What happens if $a < 0$?

b. What happens if $a = 1$?