Graphing Exponential Functions Class Work
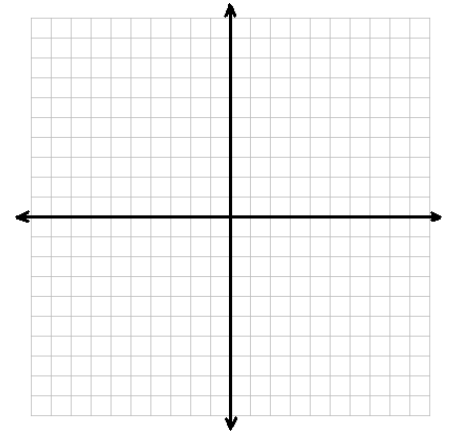
❧ **Objective:** *You will be able to graph and state the domain & range of exponential functions.*

★ **Parent Exponential Function:** $f(x) = b^x$, where b is any real number.

Create a table of values to sketch a graph of the function $f(x) = e^x$.
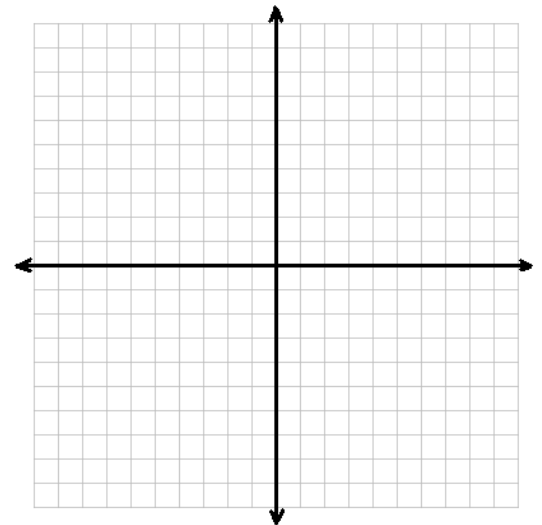
State the domain and range of the function.

An *asymptote* is a line that a graph approaches, but never actually reaches.
What is the horizontal asymptote of the parent exponential function?

★ **Example:** Consider the function $f(x) = 3*(2)^{-x+1} - 8$.

a. Does this function represent exponential growth or decay, and how do you know?

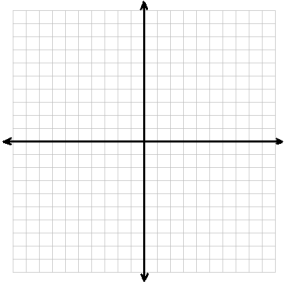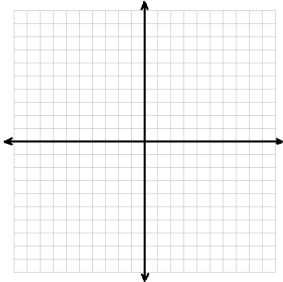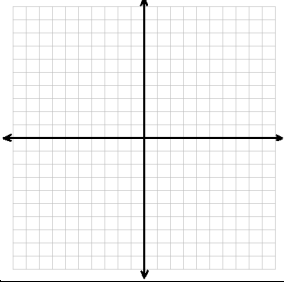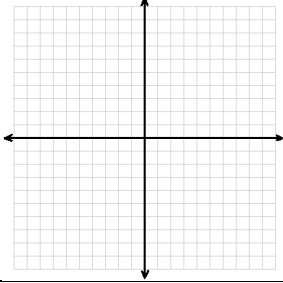b. Compared to the "base function, given by" $y = 3*2^x$, what transformations of the graph would you expect?

c. Create a table of values to graph the "base function," $y = 3*2^x$. Then translate and/or reflect the points to create the graph of the function $f(x) = 3*(2)^{-x+1} - 8$.

d. State the domain and range of each graph.

e. What is the horizontal asymptote of each graph?

1. g(x) = 2*(½)$^{x-2}$ + 1	2. w(x) = -3*(3)$^{x+3}$ - 4
Base function:	Base function:
Transformation(s):	Transformation(s):
Table of Values for Base Function:	Table of Values for Base Function:
Graph g(x). You may also include the graph of the base function to guide you!	Graph g(x). You may also include the graph of the base function to guide you!
Domain of g(x):	Domain of w(x):
Range of g(x):	Range of w(x):
Horizontal asymptote of g(x):	Horizontal asymptote of w(x):

3. r(x) = ¼* (¾)$^{x+5}$ - 3	4. h(x) = -4e^{x} + 7
Base function:	Base function:
Transformation(s):	Transformation(s):
Table of Values for Base Function:	Table of Values for Base Function:
Graph g(x). You may also include the graph of the base function to guide you!	Graph g(x). You may also include the graph of the base function to guide you!
Domain of r(x):	Domain of h(x):
Range of r(x):	Range of h(x):
Horizontal asymptote of r(x):	Horizontal asymptote of h(x):

Can You Make Any Generalizations?!

1-2: Write <u>ONE</u> or <u>TWO</u> questions you have related to graphing exponential functions OR create <u>ONE</u> or <u>TWO</u> questions that could be asked about graphs of exponential functions.

3: Write <u>THREE</u> reminders related to graphing exponential functions.

Homework:

Graph, and state the domain, range, and horizontal asymptote of each equation:

1. $n(x) = 5e^{x+2} - 4$

2. $m(x) = -\frac{1}{2}(8)^x + 3$

3. $a(x) = \frac{3}{4}(0.4)^{x+6}$

4. b(x) = $7^{-x-5} - 2$

Throwback: p. 428 #60, 61, 75, and 79