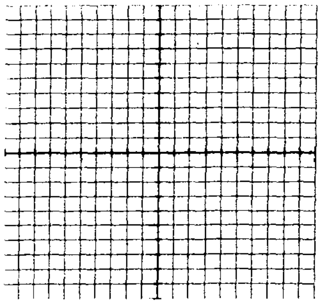
The Exponential Function

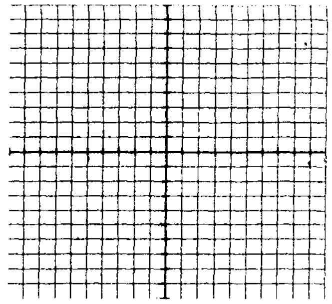
1. Graph each of the following using a table of values.

a) $y = 2^x$



x	y

b) $y = (\frac{1}{2})^x$



x	y

What do you notice about the finite differences? ____________________

Both of these equations are of the form $y = b^x$ and pass through the point ________

If the b > 1, the curve will ____________ If 0 < b < 1 the curve will ____________

Curves of growth increase ____________ at first and then more ____________ later on.

Curves of decay decrease ____________ at first and then more ____________ later on.

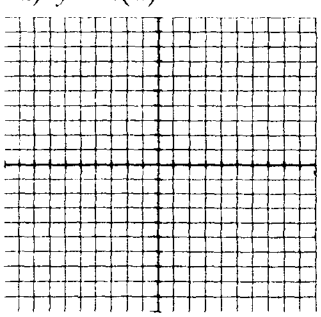
Domain ____________ Range ____________

Both graphs get very close to the x-axis but never cross it.

The x-axis is called the ____________________ It's equation is ____________

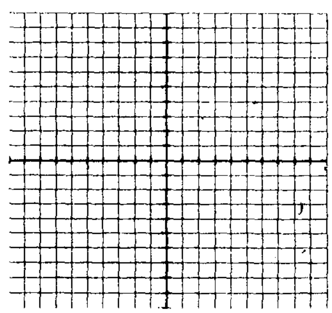
2. Graph each of the following using a table of values.

a) $y = 4(2)^x$



x	y

b) $y = 3(\frac{1}{2})^x - 5$



x	y

For the exponential function $y = ab^x + c$ what is the

vertical slide? ______ equation of the asymptote? ____

vertical stretch? ______ y-intercept? ________

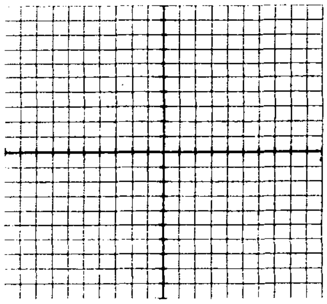
Describe the **end behaviour** for the 2 graphs above:

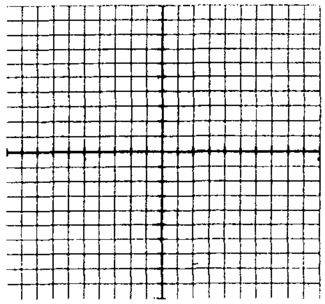
a) As $x \to \infty$, $y \to$ __________ (As x gets infinitely bigger, what does the y-value do?)
As $x \to -\infty$, $y \to$ __________ (As x gets infinitely smaller, what does the y-value do?)

b) As $x \to \infty$, $y \to$ __________
As $x \to -\infty$, $y \to$ __________

3. Graph each of the following using your knowledge of the y-intercept and the asymptote.

a) $y = 4(3)^x - 6$ b) $y = 2(\frac{1}{2})^x + 1$





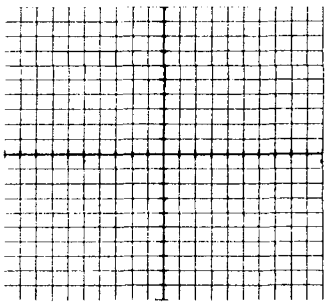
4. Describe $y = \frac{2}{3}(6)^x + 12$ as a transformation of $y = 6^x$.

Write the first in terms of the second using function notation. Let the first equation be *f(x)* and the second equation be *h(x)*.

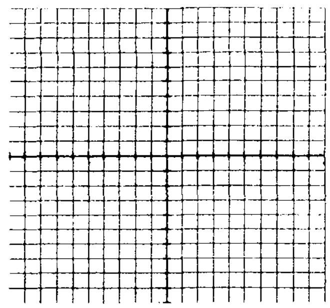
Homework:

1. Graph each of the following functions.

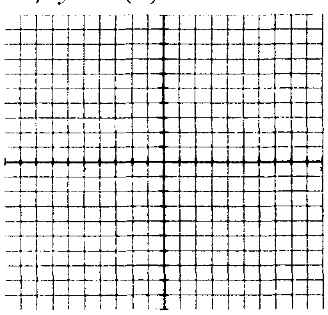
a) $y = 3^x$



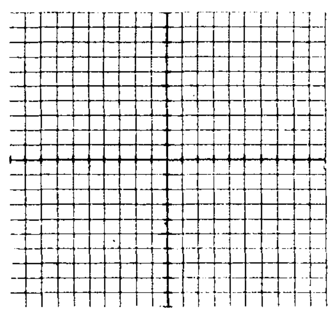
b) $y = 4(\frac{1}{2})^x$



c) $y = 3(2)^x - 8$



d) $y = 2(\frac{1}{2})^x - 4$



2. Determine whether each of the following relations are linear, quadratic, exponential, or neither.

x	y
0	81
1	27
2	9
3	3
4	1
5	1/3

x	y
0	1
2	8
4	15
6	22
8	29
10	36

x	y
0	1
1	18
2	37
3	58
4	81
5	106

3. Describe the second equation as a transformation of the first. Write the first in terms of the second using function notation. Let the first equation be *f(x)* and the second equation be *h(x)*.

a) $y = 8^x$, $y = \frac{1}{2}(8)^{x-2}$ b) $y = (\frac{1}{4})^x$, $y = 9(\frac{1}{4})^{-x} - 5$