Chapter 7 Exponential & Logarithmic Functions

Lesson 7.1 Exploring Exponential Models

Essential Understanding: You can represent repeated multiplication with a function of the form $y = ab^x$ where b is a positive number other than 1.

An exponential function is a function with the general form $y = ab^x$, $a \neq 0$, with $b > 0$, and $b \neq 1$. In an exponential function the base b is a constant. The exponent x is the independent variable with domain the set of real numbers. If $b > 1$, it is an exponential growth function and if $0 < b < 1$, it is an exponential decay.

Exponential Growth/Decay:

$A(t) = a(1 + r)^t$, where a is initial amount,

r is rate of growth ($r > 0$)

or decay ($r < 0$), and

t is number of time periods

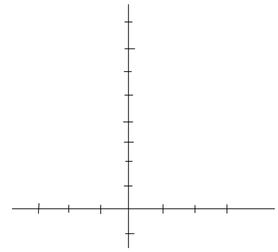
Ex. You invested $1000 in a saving account at the end of 6th grade. The account pays 5% annual interest. How much money will be in the account after six years?

Ex. The population of a city in 2000 was 42,799. Unfortunately, people are moving out of the city at a rate of 1.5% per year. How many residents will the city have in 2020?

Ex. Suppose you invest $1000 in a savings account that pays 5% annual interest. If you make no additional deposits or withdrawals, how many years will it take for the account to grow to at least $1500? (Use a graphing calculator)

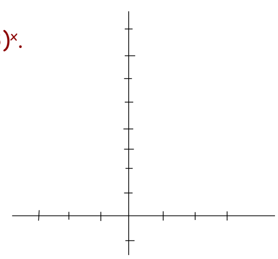
Ex. Graph $y = 2^x$.

x	y
-3	
-2	
-1	
0	
1	
2	
3	



Ex. Graph $y = (1/3)^x$.

x	y
-3	
-2	
-1	
0	
1	
2	
3	



Ex. Graph $y = 2(3)^x$.

x	y
-3	
-2	
-1	
0	
1	
2	
3