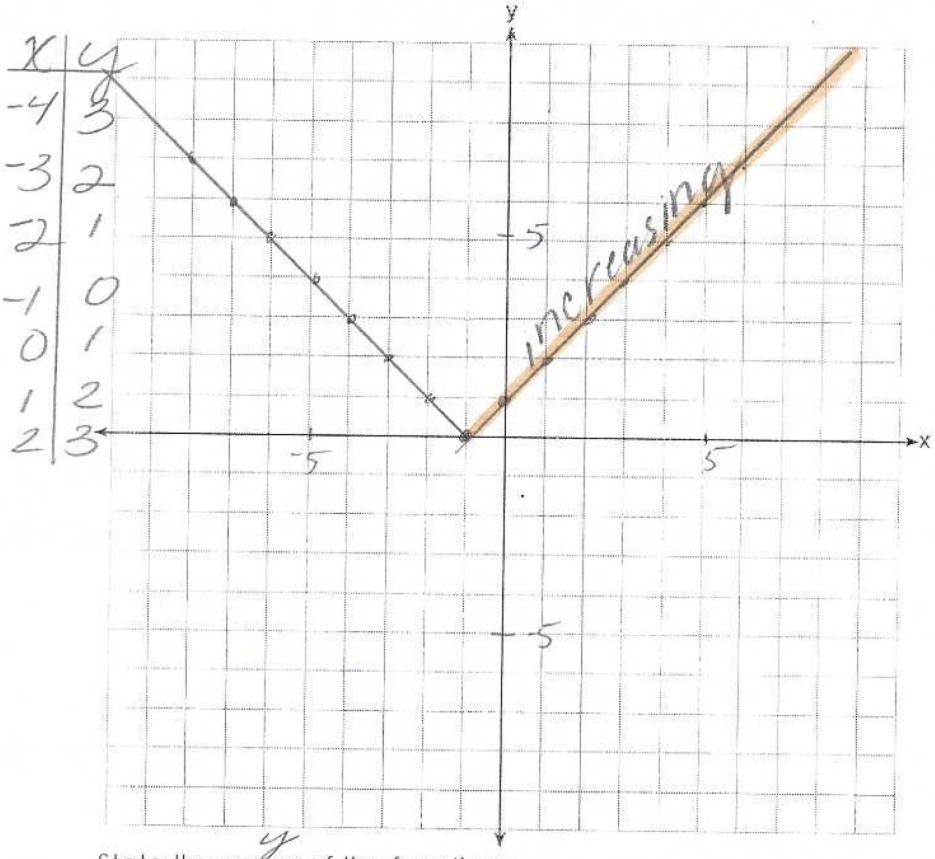
Warm-up April 4

On the set of axes below, graph the function $y = |x+1|$.

x	y
-4	3
-3	2
-2	1
-1	0
0	1
1	2
2	3



State the range of the functions.

$y \geq 0$ or $[0, \infty)$

State the domain over which the function is increasing.

$x > -1$ or $(-1, \infty)$

Explain how the graph of the function has changed from the parent function?

It shifted over to the left 1 unit.

Notes: Exponential Functions

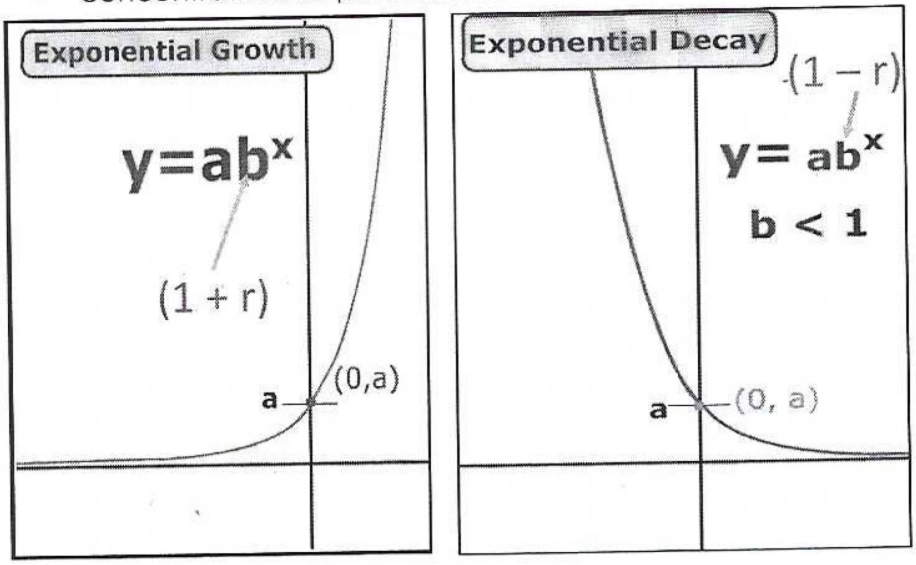
Created for you by Ms. Nhotsoubanh

An **exponential function** is a function that contains a variable for an exponent.

The equation is in the form of: $y = ab^x$ (with $b \geq 0$).
In many cases:
- ***a*** represents a starting or initial value,
- ***b*** represents the multiplier or growth/decay factor, and
- **x** represents the time.

Exponential functions are useful for modeling real world events such as:

- population growth
- bacteria growth
- radioactive decay
- compound interest on loans and investments
- concentrations of medicine in the body
- concentrations of pollutants in the environment



Name: Key

Alg. 1 H – April 8 4

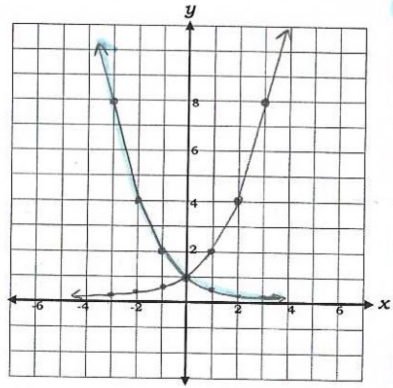
Glue on page 5 ~~102~~

HW - Green text p. 392 #s 12 – 15 and finish HW section in foldable

Example1. Graph the equations: $y = 2^x$ and $y = \left(\frac{1}{2}\right)^x$

$y = 2^x$

x	y
-3	0.125
-2	0.25
-1	0.5
0	1
1	2
2	4
3	8



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

x	y
-3	8
-2	4
-1	2
0	1
1	0.5
2	0.25
3	0.125

* will never touch 0

Compound interest is an example of exponential growth.

Ex2. If $2,300 (the principal, P) is invested at 4% interest, then after two year the value of the investment, A, is the principal plus the interest.

Formula: $A = P(1 + r)^n$

$A = 2300(1+0.04)^2$

$A = 2487.68$

Ex. 3 The population of a town is decreasing at the rate of 2.5% per year. If the population in the year 2000 was 28,000, what will be the expected population in 2015 if this rate of decrease continues? Give your answer to the nearest thousand.

$A = P(1+r)^n$

$A = 28{,}000(1-0.025)^{15}$

$A = 19{,}152.5792$

$A = 19{,}000$

Ex. 4 The value, y, of a $15,000 investment over x years is represented by the equation $y = 15000(1.2)^{\frac{x}{3}}$. What is the profit (interest) on a 6-year investment?

$y = 15000(1.2)^{\frac{6}{3}}$

$y = 15000(1.2)^2$

$y = 21{,}600$

(1) $6,600
(2) $10,799
(3) $21,600
(4) $25,799

Ex. 5 The value of a car purchased for $20,000 decreases at a rate of 12% per year. What will be the value of the car after 3 years?

$A = P(1+r)^n$

$A = 20{,}000(1-0.12)^3$

$A = 13{,}629.44$

(1) $12,800.00
(2) $13,629.44
(3) $17,600.00
(4) $28,098.56

Homework: Complete #s 1-3 and green textbook page 392 #s 12-15 use pages ~~103~~ 697 & ~~104~~.

1. Movie tickets now average $9.75 a ticket, but are increasing 15% per year. How much will they cost 5 years from now?

2. A powerful computer is purchased for $2000, but on the average loses 20% of its value each year. How much will it be worth 4 years from now?

3. Most cars decrease in value after you leave the dealer. However, some cars are now considered "classics" and actually increase in value. You have the choice of owning two cars: A 2006 Mazda Maita which is worth $19,000 but is depreciating 10% per year, or a classic 1970 Ford Mustang which is worth $11,500 and is increasing in value by 6% each year. Your tasks:

a. Write an equation to represent the value of each car over time.

b. Use your graphing calculator to determine approximately when the Mazda and the Ford have the same value.

**Press 2nd Calc(above Trace), choose 5: intersect then press enter 3 times.