

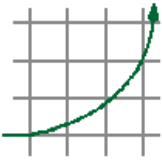
Before we begin, are there any questions from last day's work?

Today's Learning Goal(s):

By the end of the class, I will be able to:

- a) sketch an exponential relation (growth or decay)
- b) state similarities and differences between growth and decay graphs
- c) recognize an exponential relation by its equation
(ie. not needing a graph)

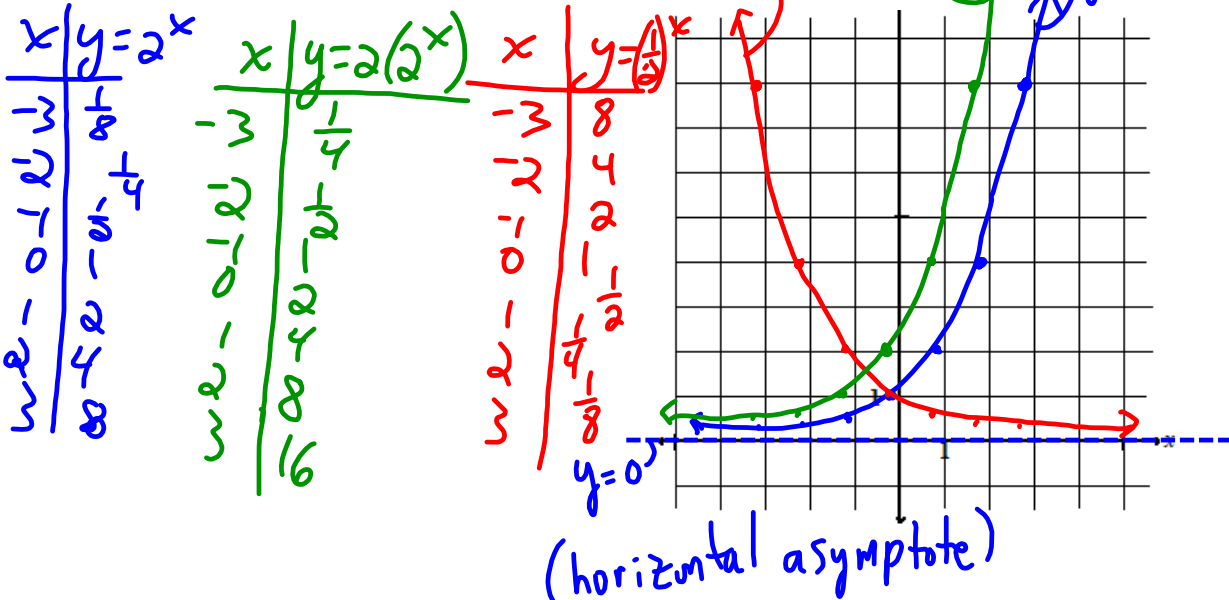
MBF 3CI

Date: Dec. 1/16

Graphing Exponential Relations (7.4)

1. a) On the same set of axes, graph $y = 2^x$ and $y = \left(\frac{1}{2}\right)^x$.

Use a table of values for each graph, with x from -3 to 3 .



b) Describe how the graphs are similar.

- ☛ both are exponential relations
- ☛ both have a y -intercept of 1
- ☛ both never cross the x -axis, \therefore no x -intercept (same asymptote: $y = 0$)

c) How are the graphs different?

- ☛ $y = 2^x$ is an example of exponential GROWTH (it is increasing).
- ☛ $y = \left(\frac{1}{2}\right)^x$ is an example of exponential decay (it is decreasing).

d) For both graphs, what is their y -intercept? What is their x -intercept?

- ☛ both graphs have a y -intercept of 1
- ☛ both graphs do not have an x -intercept (there is a horizontal **asymptote**, that the curve will never cross).

e) Now graph $y = 2(2^x)$ on the grid.

An **exponential relation** is of the form $y = a(b^x)$, where a and b are numbers, $b \neq 1$ and x and y are variables. For example, $y = 2(3.1^x)$ is an exponential relation.

2. Which of the following are exponential relations? Explain.

a) $y = 4(3^x)$

b) $y = x^3$

👉 Exponential.
The variable is in the exponent.

👉 **NOT** Exponential.
The exponent is 3, not a variable.

c) $V = 2.1^t$

d) $y = 4 \times (1.01)^x$

👉 Exponential.
The variable is in the exponent.

👉 Exponential.
The variable is in the exponent.

$$V = 1(2.1)^t$$

For an exponential relation $y = a(b^x)$,

☞ if $b > 1$, then exponential growth

☞ if $0 < b < 1$, then exponential decay

Also for $y = a(b^x)$

- ☐ The y -intercept is always a .
- ☐ There is no x -intercept.

Entertainment: YOU NEED GRAPH PAPER FOR #4.

1. READ p.385 Ex.2, pp.386-387 Ex.3
2. READ p.389 "Key Concepts"
3. p. 390 #1 and 2
4. p. 391 #4 (in your table of values choose x from -3 to 3. Also, look in the text's answer section to check your graphs **instead of a graphing calculator.**)
5. p. 391 #6
6. Are you done last class' homework on the worksheet? If not, do it now.