Part 1 8-7 page 430

(a) $y = a \cdot b^x$ is the **general form** for an Exponential Eq.

(b) What are the allowed values for

x : Any real number

a : $a \neq 0$

b : $b>0$ and $b \neq 1$

Part 2 8-8 page 437

b is the **base** of this function. When $b > 1$ the equation $y = a \cdot b^x$ models Exponential Growth

and b is called the Growth Factor

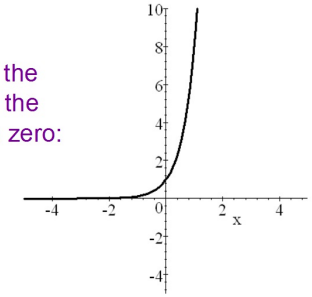
Part 3 Graphing Calculator Exercises

A) Use a graphing calculator and graph $Y_1 = 2^X$

B) What is the y-intercept?

It looks like it passes through the y-axis at 1. You can also find the y-intercept by replacing x with zero:

$y = 2^0 = 1$

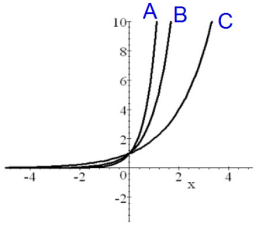


C) In Y_2 and Y_3 graph $y = b^x$ for two other values of b bigger than 2, such as $Y_2 = 4^x$ and $Y_3 = 8^x$

$Y_1 = 2^X$ C

$Y_2 = 4^x$ B

$Y_3 = 8^x$ A



E) What happens to the graphs as b increases?

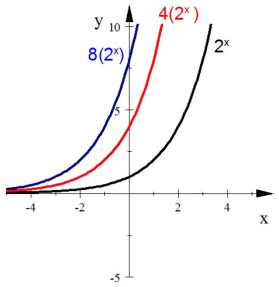
As the base increase the graph grows faster

F) What point do all three graphs have in common?

The same y-intercept

A) Leaving $Y_1 = 2^x$ (this is where $a = 1$ & $b = 2$) Graph in Y_2 and Y_3 $y = a \cdot 2^x$ for 2 other positive values of a. For example, graph $Y_2 = 4 * 2^x$ and $Y_3 = 8 * 2^x$

B) Make a sketch of all three graphs, labelling each graph with it's equation.

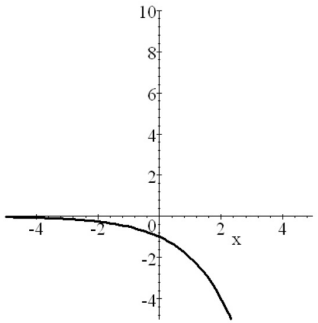


C) Explain what changing the value of a does to the graph.

It changes the y-intercept

D) Now graph $y = a \cdot 2^X$ for a negative value of a.
What does this do to the graph? Reflects over the x-axis (upside down)

$y = -1 \cdot 2^X$



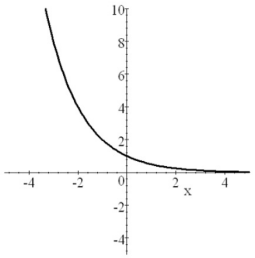
Part 5 Sec 8-8 page 440

A) When the value of b is between 0 and 1, $0 < b < 1$,

then the equation $y = a \cdot b^X$ models Exponential Decay

and b is called the Decay Factor

B) Graph $Y_1 = 0.5^X$



C) Describe how this graph is different from the graphs in Part 3.

The graph decreases as you move to the right.

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

y= amount at the end

a = the y-intercept of the graph or
the original amount.

b = the Growth Factor if b>1
the bigger b gets the faster the graph grows

or

the Decay Factor if 0<b<1
the smaller b gets the faster the graph decays

Find the y-intercept for each:

1. $y = 0.125(3)^x$ y-int = 0.125

2. $y = 9^x$ y-int = 1

Exponential Growth:

1. $y = 16(1.057)^x$ 2. $y = 0.39(5)^x$ 3. $y = 6(1.068)^x$

Which graph is steeper?

#2, it has the largest base

Which graph is flatter?

#1, it has the smallest base

Exponential Decay

1. $y = 0.75(0.962)^x$ 2. $y = 39(0.45)^x$ 3. $y = 8(0.72)^x$

Which graph is steeper?

#2, it has the smallest base

Which graph is flatter?

#1, it has the largest base

For exponential growth: The bigger the base the steeper the graph.

For exponential decay: The smaller the base the steeper the graph.

For Exponential Graphs in general:
The closer the base is to 1 the flatter the graph