**Graphing Exponential Functions Lesson Activity**

**Expectations:** Students should be able to solve y-intercepts, understand asymptotes and be able to write domain and range of functions in interval form. Students should be able to graph functions without the use of a calculator.

**Directions:**

*Graph the following in your calculator and list domain, range, y-intercepts and asymptotes.*

y=(1/2)x

Y=(2)x

What can you conclude from varying b?

Are there relationships between the items listed for each problem and graphing the function?

y=(2)x-3

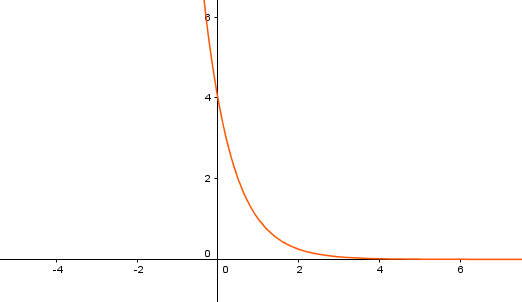
y=(2)x+2

What can you conclude from varying h?

Are there relationships between the items listed for each problem and graphing the function?

**Directions:**

*Estimate the equation and support your solution mathematically.*

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**Directions:**

*Sketch the graphs without a calculator, show your work and list any other observations.*

y=(1/3)x-1

y=(3)x-1

y=(1/2)x+4

Observations

The y intercept is greater than 1 when b>1 and h is negative, or 0<b<1 and h is positive.

The y intercept is less than 1 when b>1 and h is positive, or 0<b<1 and h is negative.

The y intercept is b-h

When b varies from b>1 to 0<b<1 the graph reflects around x=h, so that the y intercept remains unchanged.

When b increases to values greater than 1 the graph becomes steep (compressed).

When b decreases to values towards 1 the graph becomes less steep (stretched).

When b decreases from values less than 1 the graph becomes steep (compressed).

When b increases from values greater than 0 to 1 the graph becomes less steep (stretched).