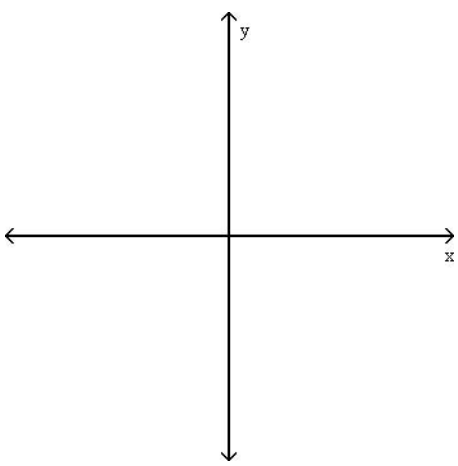
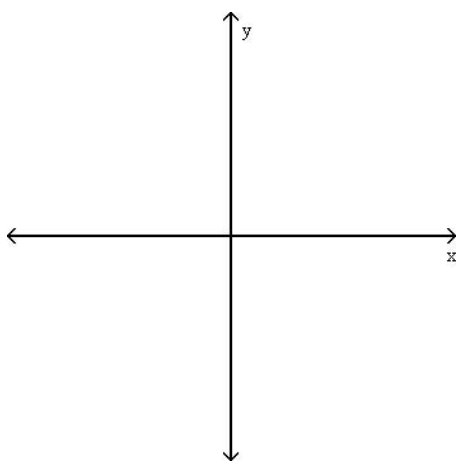


**Math 103 – Linear and Exponential Functions**

$$f(x) = mx + b \qquad g(x) = a \cdot b^x$$

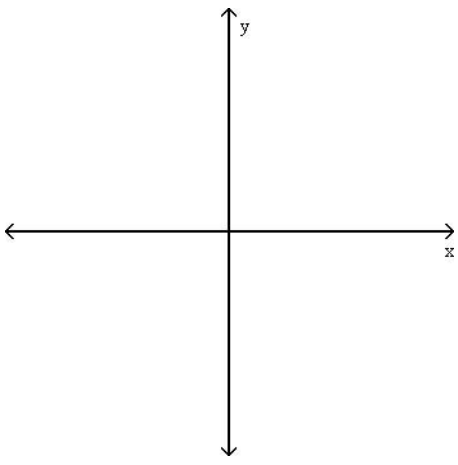
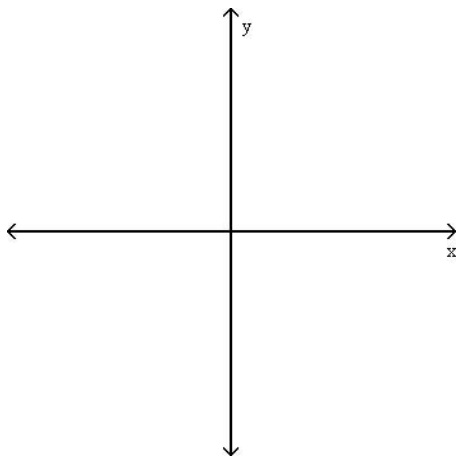
1) Complete the following tables, sketch a graph (no tick marks please!!!) A graph that makes sense is enough. Label the y-intercept.

<b>Linear Function</b>	<b>Exponential Function</b>																												
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2) Write the functions represented by the tables in problem (1)

$$f(x) = mx + b \qquad g(x) = a \cdot b^x$$

3) Complete the following tables, sketch a graph (no tick marks please!!!) A graph that makes sense is enough. Label the y-intercept.

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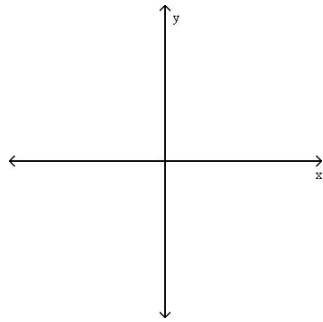
4) Write the functions represented by the tables in problem (3)

$$f(x) = mx + b$$

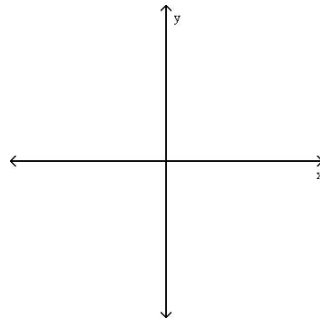
$$g(x) = a \cdot b^x$$

- 5) DO NOT USE THE CALCULATOR TO GRAPH - For each of the following functions,
- Show the algebra to find the y-intercept.
  - Label the y-intercept in the graph.
  - Specify whether the function is increasing or decreasing.
  - Explain what number in the function helps you decide whether the function is increasing or decreasing
  - Sketch a graph. (No tick-marks; a graph that makes sense is enough).

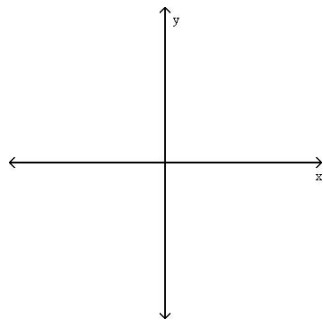
(i)  $f(x) = 12 \cdot (5)^x$



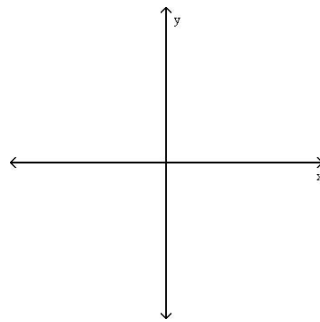
(ii)  $f(x) = 12 + 5x$



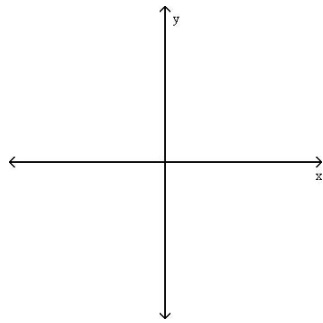
(i)  $f(x) = 8 \cdot (4/5)^x$



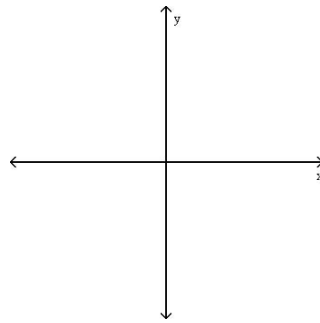
(ii)  $f(x) = 0.3 \cdot (5/4)^x$



(i)  $f(x) = 2.5 \cdot (0.23)^x$

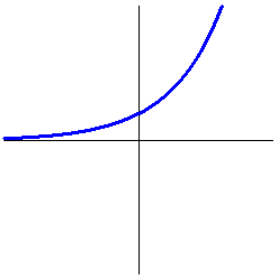


(ii)  $f(x) = 3 - (5/4)x$

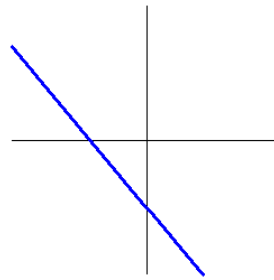


- 6) For each graph, make up a value for the y-intercept, then, write a function of the form  $g(x) = a \cdot b^x$  or  $f(x) = mx + b$  to match the graph.

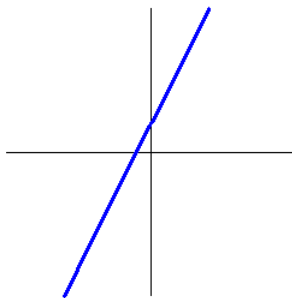
a)



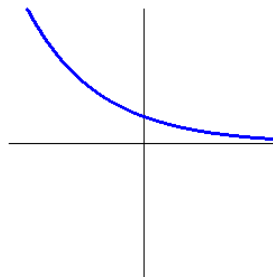
b)



c)



d)



- 7) Write a function that gives the number of bacteria,  $y$ , as a function of the time elapsed  $x$  (in days). Then, enter both functions in the calculator, and explore both tables.
- The number of bacteria in a dish is 250. Every day the number of bacteria doubles.
  - The number of bacteria in a dish is 250. Every day we have 5 more bacteria than on the preceding day.
- 8) Write a function that gives the value of the car,  $y$ , as a function of the years after we bought it,  $x$ . Then, enter both functions in the calculator, and explore both tables.
- The value of a certain new car is \$18,000. Every year the value of the car is  $\frac{8}{9}$  of the value at the preceding year.
  - The value of a certain new car is \$18,000. Every year the value decreases by \$2000.