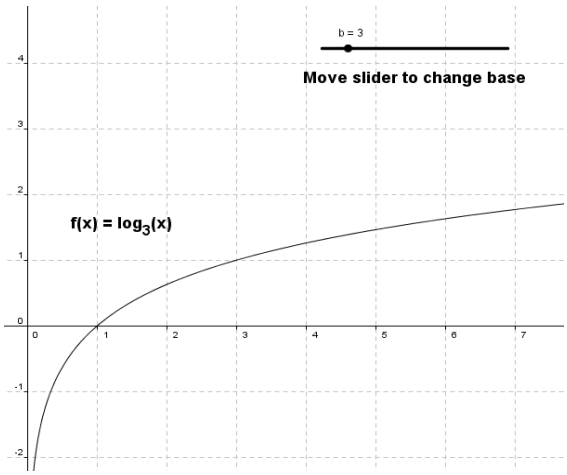
Student Activity: To investigate the graph of $\log_n x$

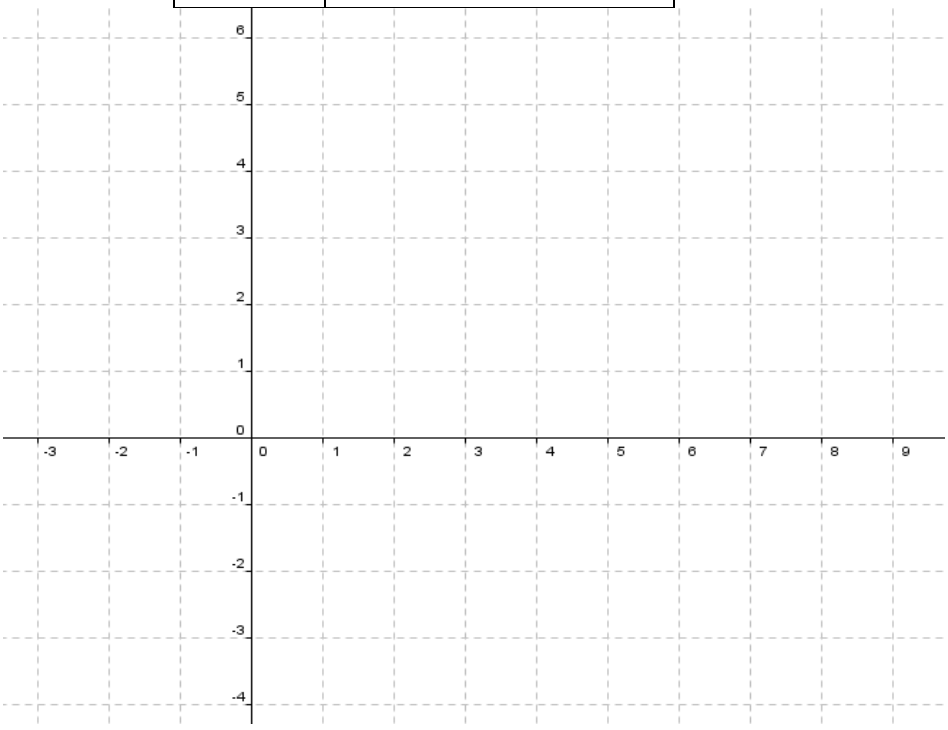
Use in connection with the interactive file, 'Log Graph', in the Student's CD.



1)

a) Complete the following table using your calculator and draw the graph $f(x) = \log_2 x$.

x	$\log_2 x = \frac{\log_{10} x}{\log_{10} 2}$
0	
1/8	
1/4	
1/2	
1	
4	
8	



b) Where does this graph cut the x-axis?

_____

c) Determine from your graph an approximate value for $\log_2 7$.

_____

d) Explain in your own words, why it is that the graph tends towards the y-axis as x tends towards zero.

_____

_____

e) Could the point (64, 6) lie on the graph $f(x) = \log_2 x$? Explain your answer; you may test on a calculator if necessary.

_____

_____

f) Could the point (56, 8) lie on the graph $f(x) = \log_2 x$? Explain your answer; you may test on a calculator if necessary.

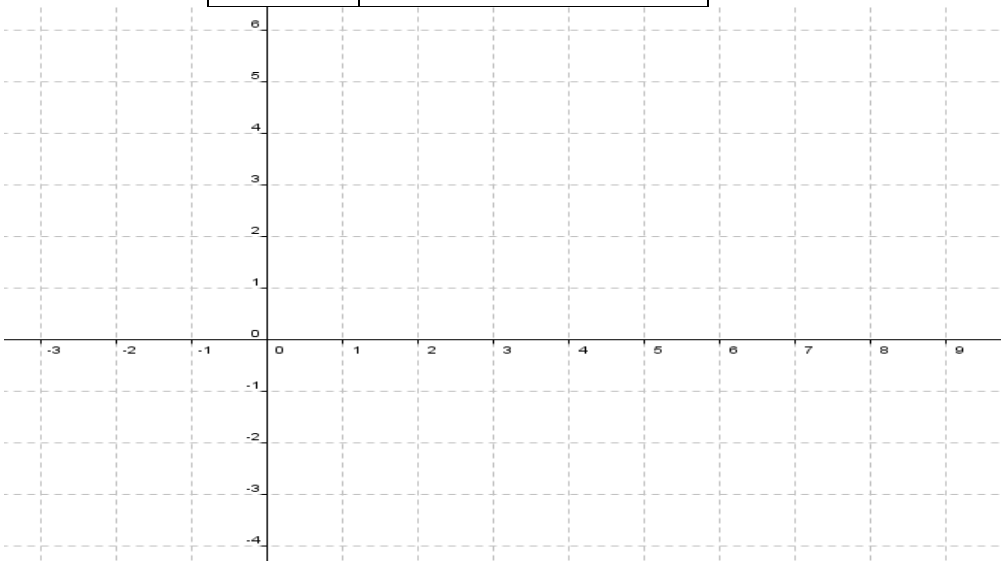
_____

_____

2)

a) Complete the following table using your calculator and draw the graph $f(x) = \log_3 x$.

x	$\log_3 x = \frac{\log_{10} x}{\log_{10} 3}$
0	
1/27	
1/9	
1/3	
1	
9	



b) Where does this graph cut the x-axis?

_____

c) Determine from your graph an approximate value for $\log_3 10$.

_____

d) Explain in your own words, why it is that the graph tends towards the y-axis as x tends towards zero.

_____

_____

e) Could the point (243, 5) lie on the graph $f(x) = \log_3 x$? Explain your answer; you may test on a calculator if necessary.

_____

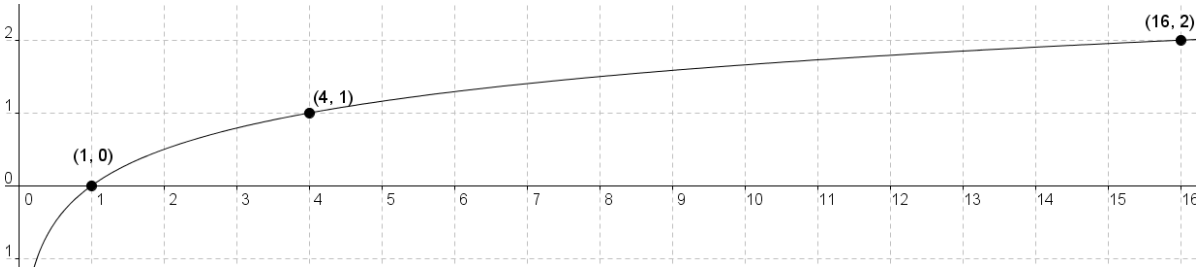
_____

f) Could the point (56, 6) lie on the graph $f(x) = \log_3 x$? Explain your answer; you may test on a calculator if necessary.

_____

_____

3)



a. If you know this graph represents $f(x) = \log_b x$, use the interactive file to find what value b represents.

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b. Verify algebraically, using indices, the answer you got for b above.

_____

_____

4) If $4 = \log_2 x$, calculate the numerical value of x.

_____

_____

5) Using the interactive file find approximate values for the following:

a) $\text{Log}_4 17$

b) $\log_2 10$

c) $\log_3 10$

d) $\log_5 19$.

6) Could the point (-2, 8) be found on the graph $f(x) = \log_b x$, for any possible value of b. Explain your answer.

7) List 4 points that would be found on the graph $f(x) = \log_4 x$.

8) Name 1 point that will always be on the curve $f(x) = \log_b x$, no matter what positive other than one value that b has. Explain why.

9) Describe 3 characteristics of the shape of the curve $f(x) = \log_b x$.

10) If $y = \log_b x$, write x in terms of b and y.