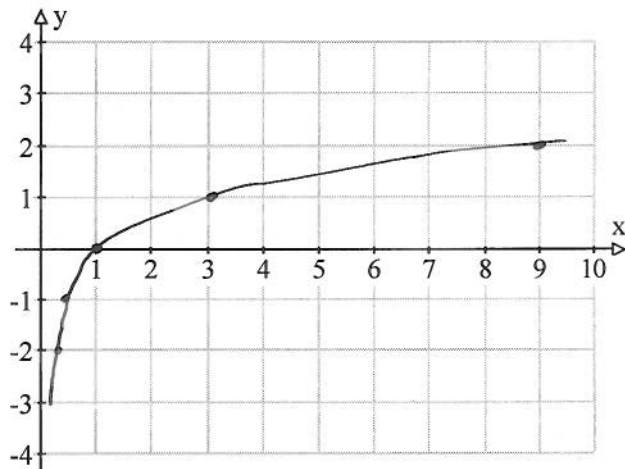


MAT 012

Homework, Ch 12.1: Logarithmic Functions

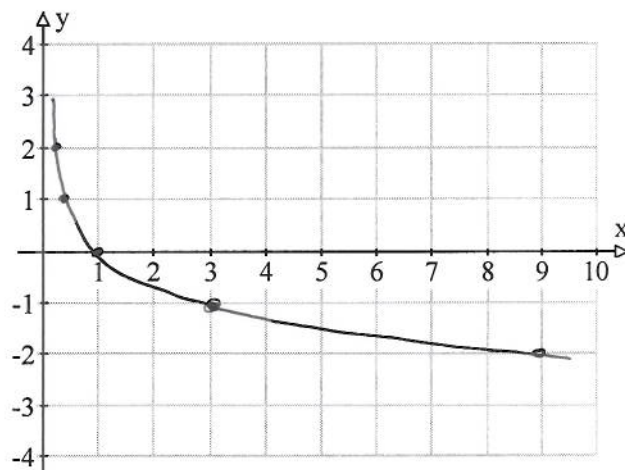
1) Make a table of points for the functions $f(x) = 3^x$ and $g(x) = \log_3 x$, and then graph $g(x)$ in the given coordinate system.

x	3^x	x	$\log_3 x$
-2	$3^{-2} = \frac{1}{9}$	$\frac{1}{9}$	-2
-1	$3^{-1} = \frac{1}{3}$	$\frac{1}{3}$	-1
0	$3^0 = 1$	1	0
1	$3^1 = 3$	3	1
2	$3^2 = 9$	9	2



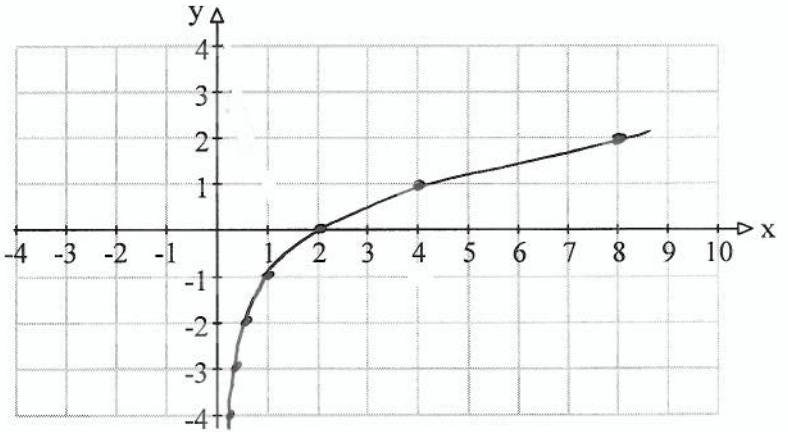
2) Make a table of points for the functions $f(x) = \left(\frac{1}{3}\right)^x$ and $g(x) = \log_{\frac{1}{3}} x$, and then graph $g(x)$ in the given coordinate system.

x	$\left(\frac{1}{3}\right)^x$	x	$\log_{\frac{1}{3}} x$
-2	$\left(\frac{1}{3}\right)^{-2} = 3^2 = 9$	9	-2
-1	$\left(\frac{1}{3}\right)^{-1} = 3^1 = 3$	3	-1
0	$\left(\frac{1}{3}\right)^0 = 1$	1	0
1	$\left(\frac{1}{3}\right)^1 = \frac{1}{3}$	$\frac{1}{3}$	1
2	$\left(\frac{1}{3}\right)^2 = \frac{1}{9}$	$\frac{1}{9}$	2



3) Develop tables of functions that can be used to graph $g(x) = \log_2 x - 1$. Label each table with the appropriate function name. Then show the graph of the given logarithm function in the provided graph paper.

x	2^x	x	$\log_2 x$	x	$\log_2 x - 1$
-3	$2^{-3} = \frac{1}{2^3} = \frac{1}{8}$	$\frac{1}{8}$	-3	$\frac{1}{8}$	$-3 - 1 = -4$
-2	$2^{-2} = \frac{1}{2^2} = \frac{1}{4}$	$\frac{1}{4}$	-2	$\frac{1}{4}$	$-2 - 1 = -3$
-1	$2^{-1} = \frac{1}{2}$	$\frac{1}{2}$	-1	$\frac{1}{2}$	$-1 - 1 = -2$
0	$2^0 = 1$	1	0	1	$0 - 1 = -1$
1	$2^1 = 2$	2	1	2	$1 - 1 = 0$
2	$2^2 = 4$	4	2	4	$2 - 1 = 1$
3	$2^3 = 8$	8	3	8	$3 - 1 = 2$



4) Develop tables of functions that can be used to graph $g(x) = \log_{\frac{1}{3}} x - 2$. Label each table with the appropriate function name. Then show the graph of the given logarithm function in the provided graph paper.

x	$(\frac{1}{3})^x$	x	$\log_{\frac{1}{3}} x$	x	$\log_{\frac{1}{3}} x - 2$
-2	$(\frac{1}{3})^{-2} = 3^2 = 9$	9	-2	9	$-2 - 2 = -4$
-1	$(\frac{1}{3})^{-1} = 3^1 = 3$	3	-1	3	$-1 - 2 = -3$
0	$(\frac{1}{3})^0 = 1$	1	0	1	$0 - 2 = -2$
1	$(\frac{1}{3})^1 = \frac{1}{3}$	$\frac{1}{3}$	1	$\frac{1}{3}$	$1 - 2 = -1$
2	$(\frac{1}{3})^2 = \frac{1}{9}$	$\frac{1}{9}$	2	$\frac{1}{9}$	$2 - 2 = 0$

