

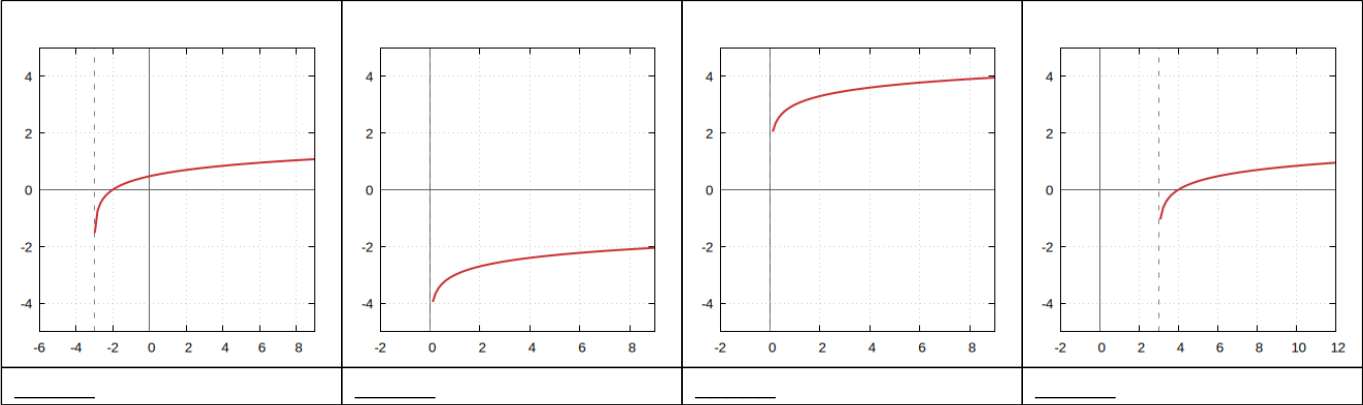
3.7 Transformations of Exponential and Logarithmic Functions Worksheet

This document was composed and formatted by Annie Bernatchez.

The course material originated from www.jensenmath.ca

1) Write the letter of the equation under the corresponding graph

A) $y = \log(x - 3)$ B) $y = \log x - 3$ C) $y = \log(x + 3)$ D) $y = \log x + 3$



2) Sketch a graph of each of the following logarithmic functions by applying transformations to the parent function. Make sure to identify key points such as asymptotes and x -intercepts.

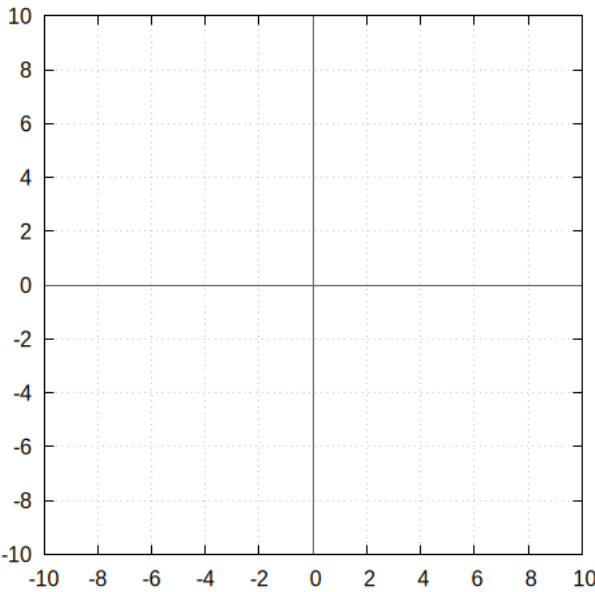
a) $f(x) = -2\log_2 x - 1$

Table 1. $y = \log_2 x$

x	y
0.5	-1
1	0
2	1
VA	$x = 0$

Table 2. $f(x) = -2\log_2 x - 1$

x	$-2y - 1$
_____	_____
_____	_____
_____	_____
VA	_____



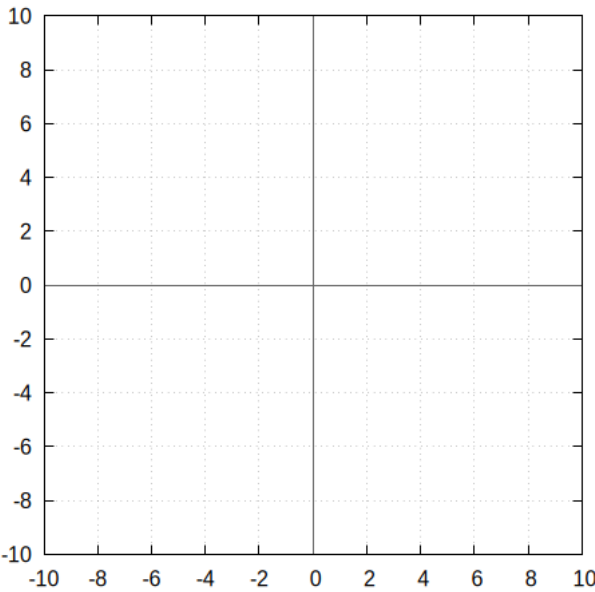
b) $g(x) = \log_4(x - 1) + 4$

Table 3. $y = \log_4 x$

x	y
0.25	-1
1	0
4	1
VA	$x = 0$

Table 4. $g(x) = \log_4(x - 1) + 4$

$x + 1$	$y + 4$
_____	_____
_____	_____
_____	_____
VA	_____



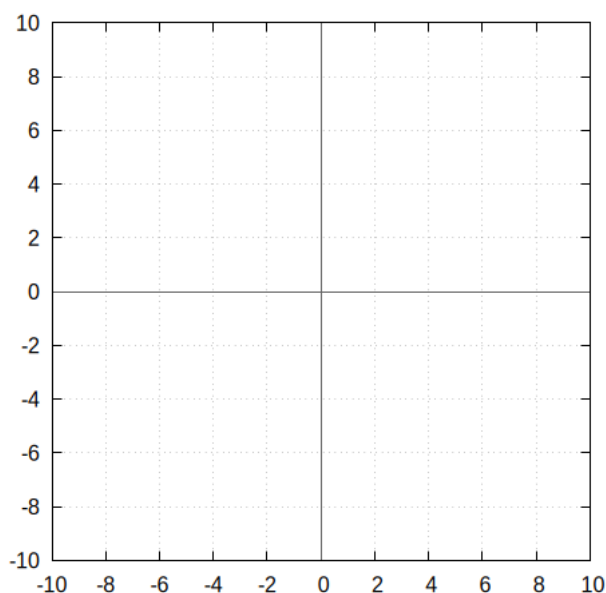
c) $h(x) = 4\log_3\left[\frac{1}{2}(x+2)\right] - 3$

Table 5. $y = \log_3 x$

x	y
0.33	-1
1	0
3	1
VA	$x = 0$

Table 6. $h(x) = 4\log_3\left[\frac{1}{2}(x+2)\right] - 3$

$2x - 2$	$4y - 3$
_____	_____
_____	_____
_____	_____
VA	_____



3) Sketch a graph of each of the following exponential functions by applying transformations to the parent function. Make sure to identify key points such as asymptotes and y -intercepts.

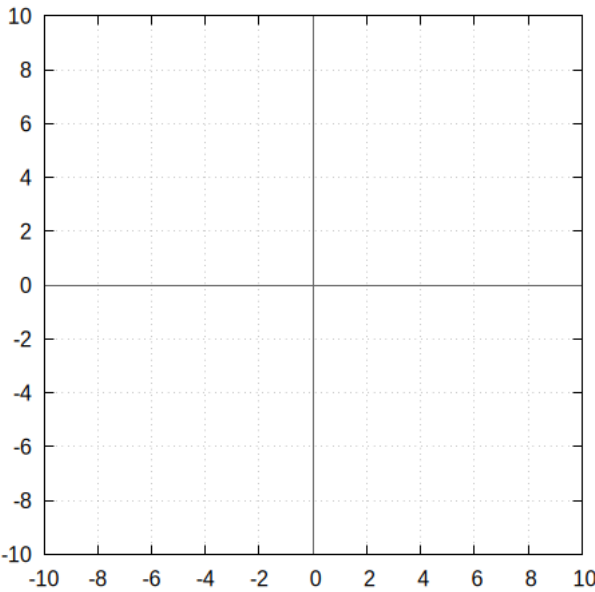
a) $f(x) = -3(2)^x + 1$

Table 7. $y = 2^x$

x	y
-1	0.5
0	1
1	2
HA	$y = 0$

Table 8. $f(x) = -3(2)^x + 1$

x	$-3y + 1$
_____	_____
_____	_____
_____	_____
HA	_____



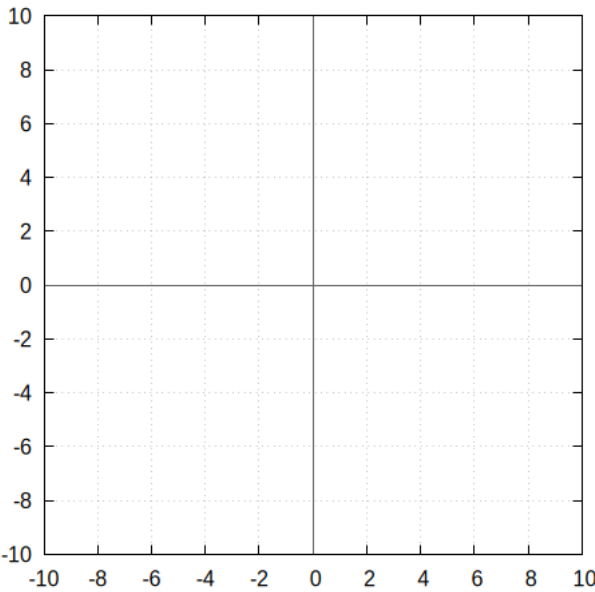
b) $g(x) = 3^{x-3} - 4$

Table 9. $y = 3^x$

x	y
-1	0.33
0	1
1	3
HA	$y = 0$

Table 10. $g(x) = 3^{x-3} - 4$

$x + 3$	$y - 4$
_____	_____
_____	_____
_____	_____
HA	_____



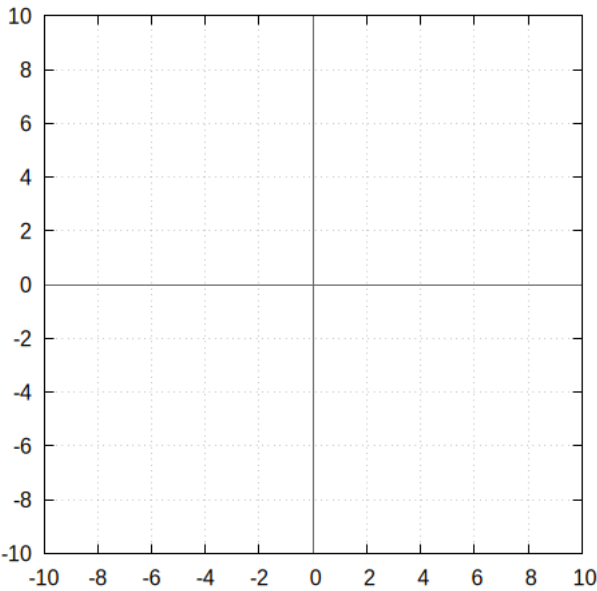
c) $h(x) = 2(4)^{\frac{1}{2}(x+1)} - 3$

Table 11. $y = 4^x$

x	y
-1	0.25
0	1
1	4
HA	$y = 0$

Table 12. $h(x) = 2(4)^{\frac{1}{2}(x+1)} - 3$

$2x - 1$	$2y - 3$
_____	_____
_____	_____
_____	_____
HA	_____



Answer Key

- 1) C, B, D, A
- 2) a) VA $x = 0$; key points $(0.5, 1), (1, -1), (2, -3)$ b) VA $x = 1$; key points $(1.25, 3), (2, 4), (5, 5)$ c) VA $x = -2$; key points $(-1.33, -7), (0, -3), (4, 1)$
- 3) a) HA $y = 1$; key points $(-1, -0.5), (0, -2), (1, -5)$ b) HA $y = -4$; key points $(2, -3.67), (3, -3), (4, -1)$ c) HA $y = -3$; key points $(-3, -2.5), (-1, -1), (1, 5)$