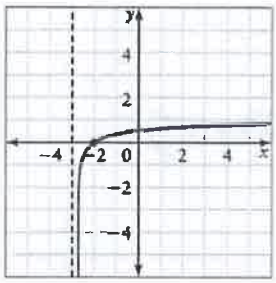
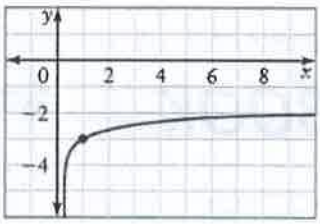
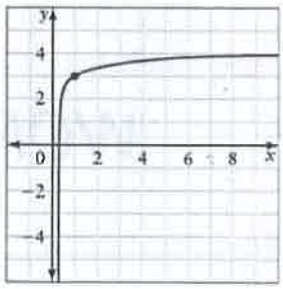
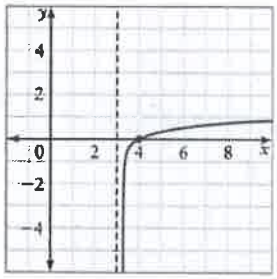
W1 – 6.3 Transformations of Exponential and Logarithmic Functions
MHF4U
Jensen

SOLUTIONS

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)** $y = \log x + 3$

			
C	B	D	A

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

$y = \log_2 x$

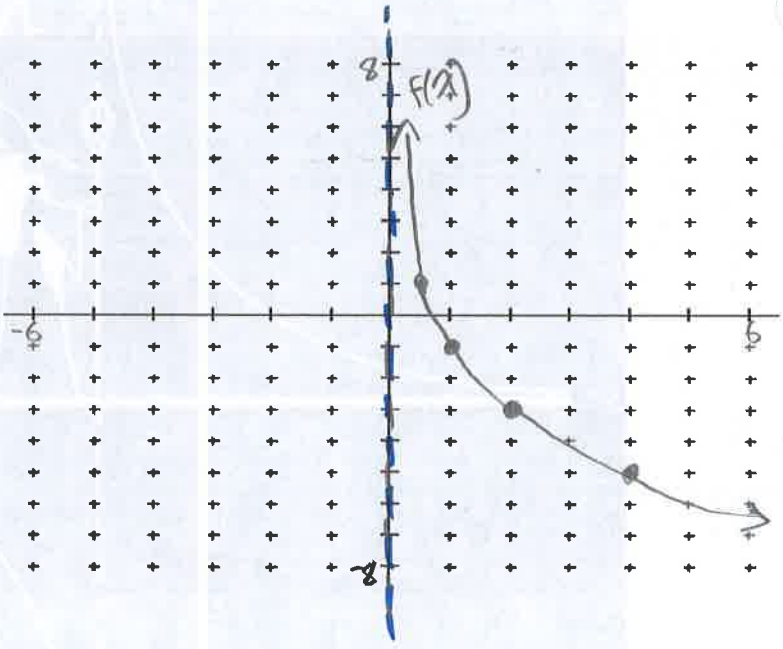
x	y
$\frac{1}{2} = 0.5$	-1
1	0
2	1

VA: $x = 0$

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

x	$-2y - 1$
0.5	1
1	-1
2	-3

VA: $x = 0$



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

$y = \log_4 x$

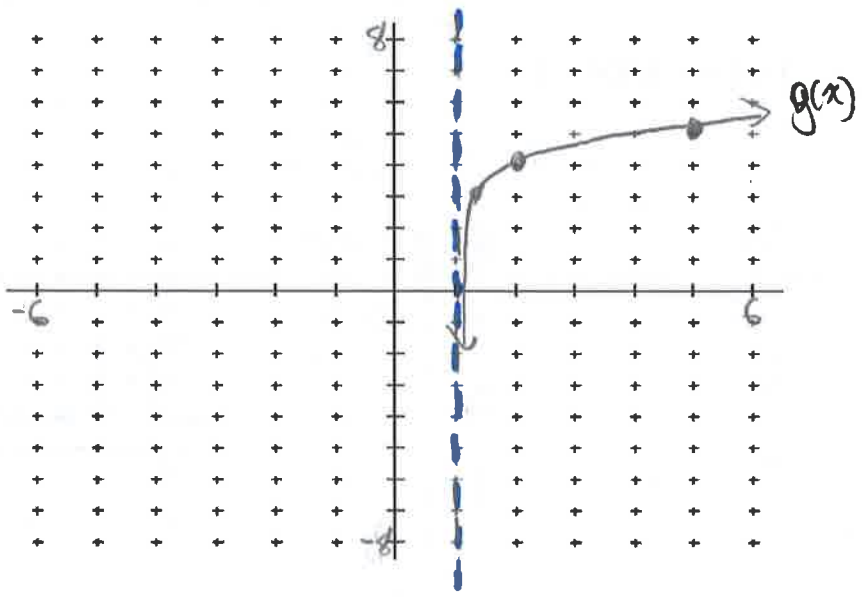
x	y
$1/4 = 0.25$	-1
1	0
4	1

VA: $x = 0$

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

$x+1$	$y+4$
1.25	3
2	4
5	5

VA: $x = 1$



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

$y = \log_3 x$

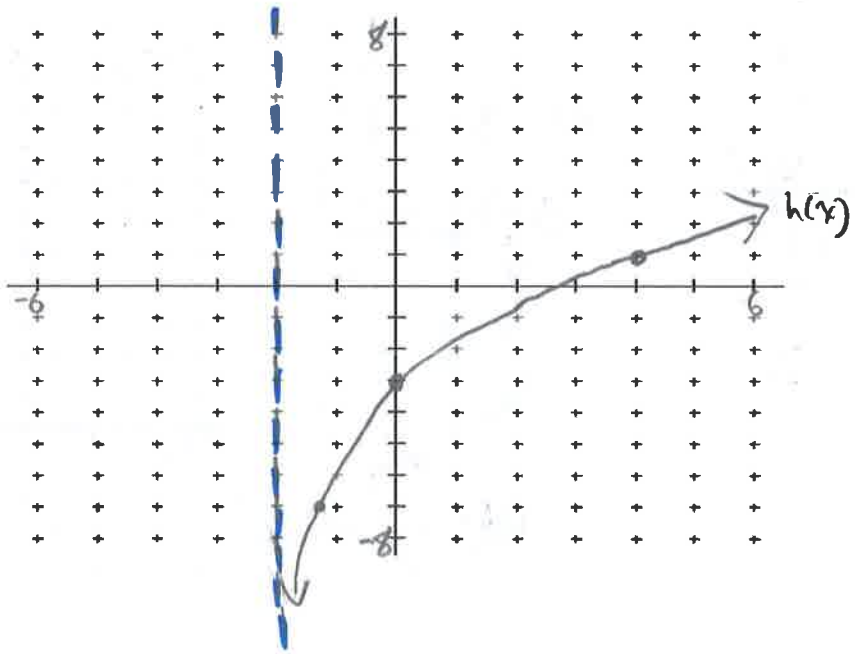
x	y
$1/3 = 0.33$	-1
1	0
3	1

VA: $x = 0$

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

$2x-2$	$4y-3$
-1.33	-7
0	-3
4	1

VA: $x = -2$



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

$y = 2^x$

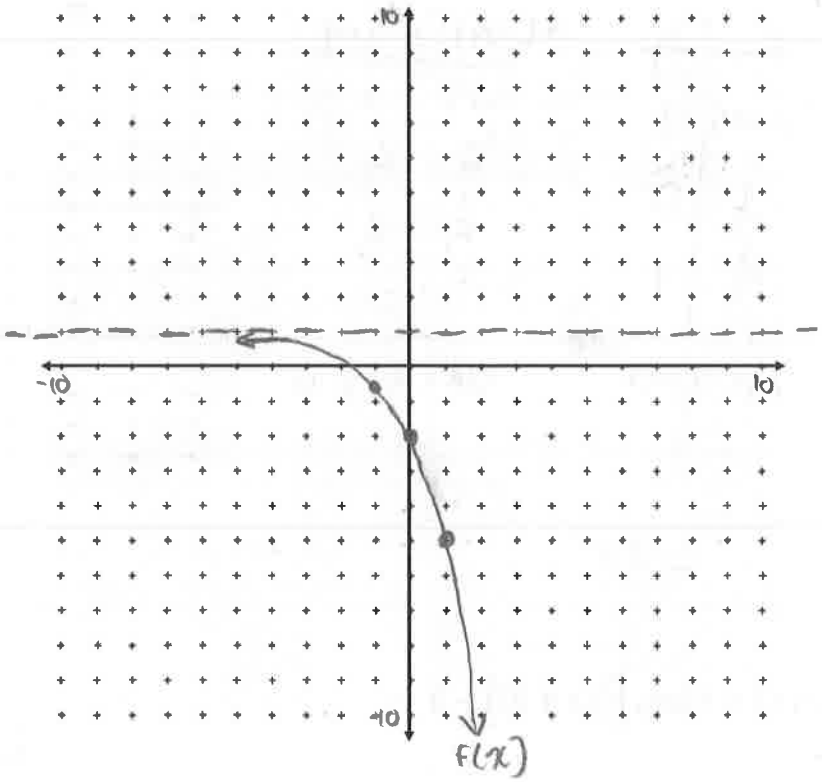
x	y
-1	$\frac{1}{2} = 0.5$
0	1
1	2

HA: $y = 0$

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

x	$-3y+1$
-1	-0.5
0	-2
1	-5

HA: $y = 1$



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

$y = 3^x$

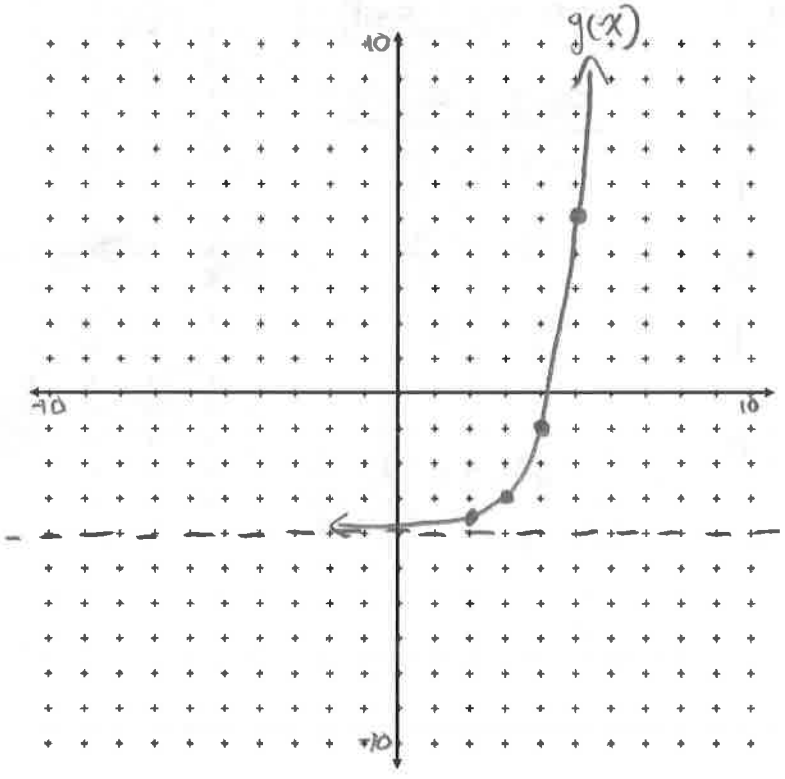
x	y
-1	$\frac{1}{3} = 0.33$
0	1
1	3

HA: $y = 0$

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

$x+3$	$y-4$
2	-3.67
3	-3
4	-1

HA: $y = -4$



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

$y = 4^x$

x	y
-1	$\frac{1}{4} = 0.25$
0	1
1	4

HA: $y = 0$

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

$2x-1$	$2y-3$
-3	$\frac{1}{2} 2.5$
-1	-1
1	5

HA: $y = -3$