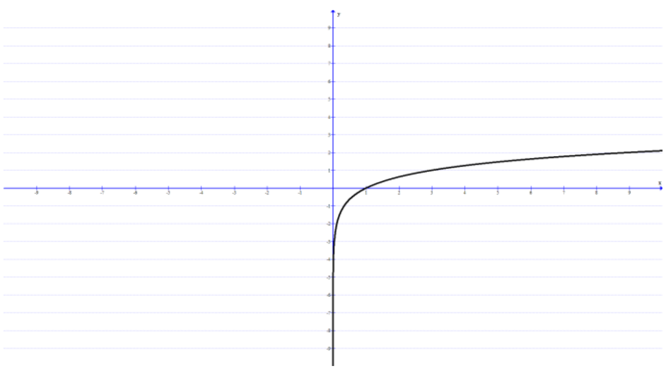
Section 6.4 Answers

1) log3(9) = 2	3) $\log_3(81) = 4$	5) $log_3 \frac{1}{3} = -1$
7) ln(x) = y	9) ln(20.09) = 3	11)ln(2.72) = 1
13) $3^4 = 81$	15) $2^6 = 64$	17) $6^1 = 6$
19) $10^3 = x$	21) $e^1 = x$	23) $e^w = 2x$
25) $e^2 = e^2$	27) 1	29) 1
31) 0	33) 0	35) 3
37) 1	39) 0	41) 2
43) 7	45) 3	47) 6
49) 5	51) 1	53) 3
55) -2	57) .7782	59) -.4771
61) -2.0969	63) 1.9459	65) 2.7726

67a)

x	y	point
3^2	2	(9,2)
3^1	1	(3,1)
3^0	0	(1,0)
3^{-1}	-1	(1/3, -1)
3^{-2}	-2	(1/9, -2)



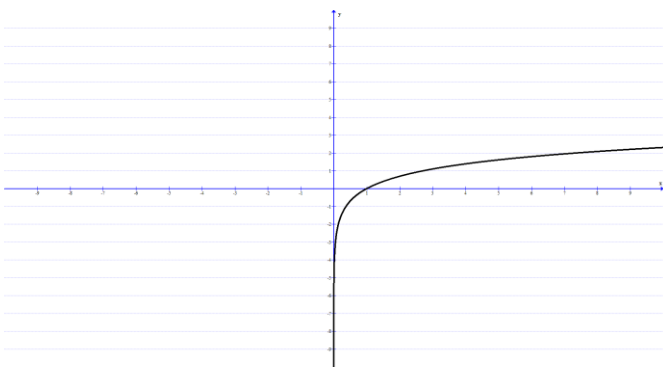
b) State the domain of each function.

67b) domain: $(0, \infty)$

69a)

Create a table of values, I will put the numbers 2,1,0,-1,-2 in the y column and solve for x.

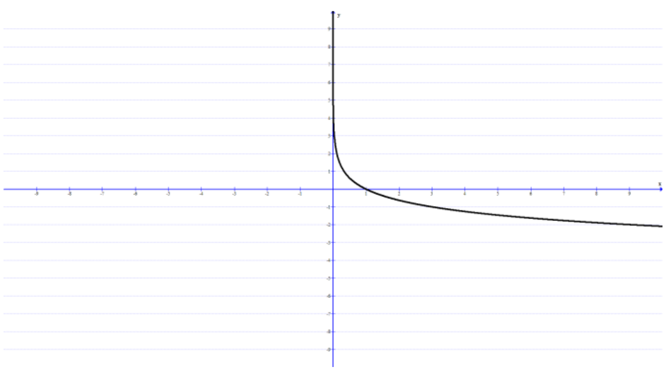
x	y	point
e^2	2	(7.39, 2)
e^1	1	(2.72, 1)
e^0	0	(1, 0)
e^{-1}	-1	(.37, -1)
e^{-2}	-2	(.14, -2)



69b) domain $(0, \infty)$

71a)

x	y	point
$\left(\frac{1}{3}\right)^{2}$	2	(1/9, 2)
$\left(\frac{1}{3}\right)^{1}$	1	(1/3, 1)
$\left(\frac{1}{3}\right)^{0}$	0	(1, 0)
$\left(\frac{1}{3}\right)^{-1}$	-1	(3, -1)
$\left(\frac{1}{3}\right)^{-2}$	-2	(9,-2)



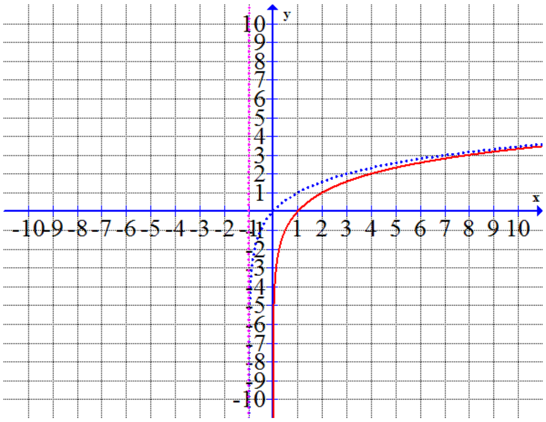
71b) domain $(0, \infty)$

73a) $f(x + 1) = \log_2(x + 1)$

73b) $x > -1$ or $(-1, \infty)$

73c) shifts left 1

73d) Graph of $f(x + 1)$ drawn in blue

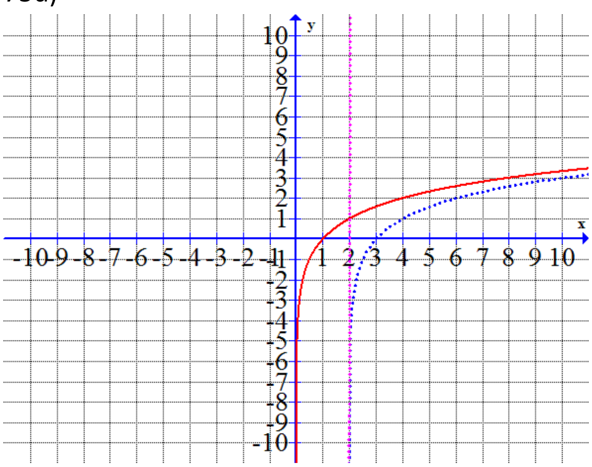


75a) $f(x - 2) = \log_2(x - 2)$

75b) $x > 2$ or $(2, \infty)$

75c) Shifts right 2

75d)



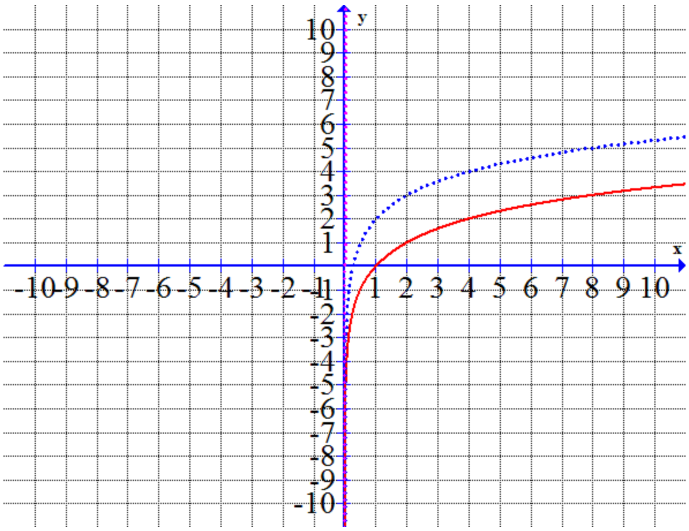
77a) f(x) + 2 = $\log_2(x)$ + 2

77b) x > 0 or $(0, \infty)$

77c) shifted up 2 units

77d) Just shift each point in the graph of f(x) two units to the up. I showed the x>0 domain as a vertical asymptote drawn in purple. The graph will not exist to the left of this vertical line x = 0.

Graph of f(x) + 2 drawn in blue



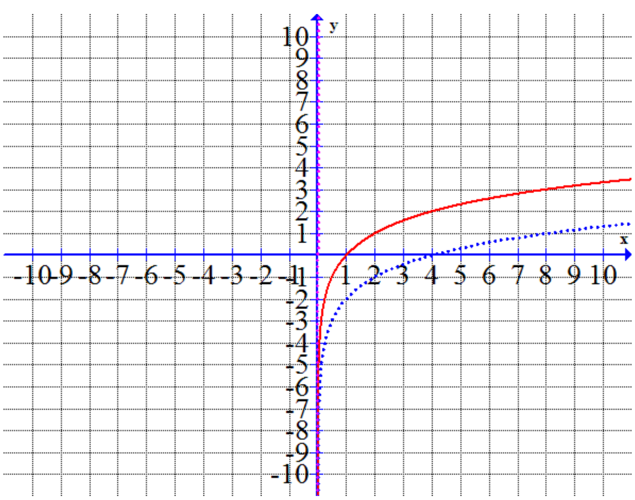
79a) f(x) – 2 = $\log_2(x)$ – 2

79b) x > 0 or $(0, \infty)$

79c) Shifted down 2 units

79d) Just shift each point in the graph of f(x) two units to the down. I showed the x>0 domain as a vertical asymptote drawn in purple. The graph will not exist to the left of this vertical line x = 0.

Graph of f(x) - 2 drawn in blue



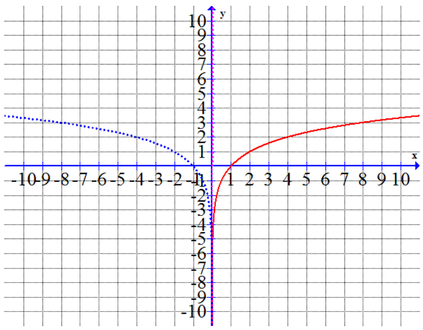
81a) $f(-x) = \log_2(-x)$

81b) any of these three answers are correct, you only need to give one answer.

$0 > x$ or $x < 0$ or $(-\infty, 0)$

81c) reflects over the y-axis

81d) Just reflect each point over the y-axis. The graph will now only exist to the left of the y-axis. The vertical asymptote will still be at x = 0 (or the y-axis). It's now the right edge of the graph as opposed to the left edge of the graph.



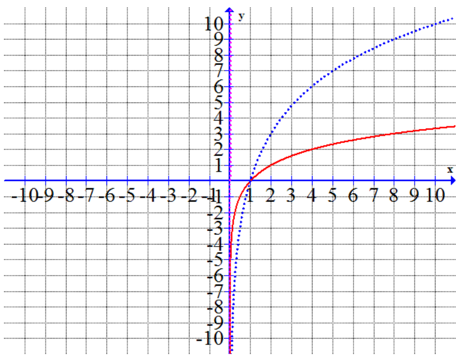
83a) $3f(x) = 3\log_2(x)$

83b) $x > 0$ or $(0, \infty)$

83c) stretches the graph

83d) This is a non-rigid transformation. I need to make a table of values to sketch an accurate graph. We can use the x's from the given table. We create y's by multiplying each y-value by 3.

3f(x) is drawn in blue. The vertical asymptote is drawn in purple.



Here are the points that are marked in the original graph

x	f(x)
.25	-2
.5	-1
1	0
2	1
4	2

The table for 3f(x) will have the same x-values, but the y's will be multiplied by 3.

Here is the table for 3f(x)

x	3f(x)
.25	-6
.5	-3
1	0
2	3
4	6