Lesson 6.2.1

6-88. See below:

- a. A log is the inverse of an exponential, since $b^y = x$ can be rewritten as $y = \log_b x$, which is the inverse of $y = b^x$.
- b. It uses a base of 10 only.
- c. $y = a\log(x h) + k$

6-89. See below:

- a. Instead of being a log graph, $y = \log(2^x)$ is linear.
- b. $y = \log_2 x$ converts to $x = 2^y$, while $y = \log(2^x)$ converts to $2^x = 10^y$, and those functions are not equivalent.

6-90. See below:

- a. false $(2 \neq \frac{1}{2})$
- b. false (students could use a counterexample)
- c. true (most students will give examples, but the proof will come later)
- d. false (students could use a counterexample)

6-91. See below:

- a. Statements should follow the form of the Power Property of Logarithms, $\log(b^x) = x(\log b)$.
- b. Statements should follow the form of the Power Property of Logarithms, $log(b^x) = x(logb)$.
- 6-92. Before this lesson, the only method students had was Guess and Check.

6-93. See below:

- a. The fact that the x is in the exponent and the bases are not the same.
- b. You can write $\log 2 = \log 1.04^x$ so $\log 2 = x \log 1.04$ and you can solve this version.

c. $x \approx 17.673$

6-94. See below:

- a. $x \approx 1.985$
- b. $x \approx 1.838$
- c. x = 2
- d. $x \approx 1.682$



6-95. See answers in bold in the table below. $y = 3^x$

x	У
0	1
1	3
2	9
3	27
4	81
5	243
б	729
7	2187
8	6561

6-96. In $2 = 1.04^x$ the variable is the exponent, but in $56 = x^8$ the exponent is known so you can take the 8th root.

6-97. x > 100, because $10^2 = 100$.

6-98. Answers vary but students should recognize that 0 < b < 1.

6-99. See below:

- a. $\frac{1}{8}$ b. $\frac{1}{x}$ c. $m \approx 1.586$ d. n = 2.587
- e. Answers vary. $x = b^{1/a}$

6-100. $2^{1/2} = \sqrt{2}$ and $2^{-1} = \frac{1}{2}$

6-101. See below:

- a. -3 < x < 3
- b. -2 < x < 1
- c. $x \leq -2$ or $x \geq 1$

6-102. See below:

- a. Yes.
- b. See graph below, (it is not a function).



- c. Not necessarily.
- d. Functions that have inverse functions have no repeated outputs; a horizontal line can intersect the graph in no more than one place.
- e. Yes; for example, a sleeping parabola is not a function, but its inverse is a function.

6-103. See below:

- a. x = -3, y = 5, z = 10
- b. There are infinitely many solutions.
- c. The planes intersect in a line.