Lesson 5.2.4

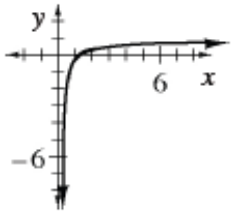
5-93. Data and justifications vary.

5-94. See below:

a. Some values in the table below are approximate.

x	0.000001	0.00001	0.0001	0.001	0.01	0.1	1	1	2	3	4	5	6
y	–6	–5	–4	–3	–2	–1	0	0	0.30	0.48	0.60	0.70	0.78

b. See graph below.



c. Teams should find a general equation of the form $f(x) = a\log(x - h) + k$.

5-95. See below:

a. The calculator is in base 10, and $\log_{10}(6) \approx 0.778$

b. $\log_{10}(6) \approx 0.778$ can be re-written as $10^{0.778} \approx 6$. The exponent 0.778 must be between 0 and 1 because $1 < 6 < 10$, $\log 1 = 10$ and $\log 10 = 1$ and generally as a number increases the exponent will increase.

5-96. See below:

a. 12 because $12^{.926628408} = 10$

b. Answers vary, but 12 fingers make sense for base 12.

5-97. See below:

a. $x = 25$

b. $x = 2$

c. $x = 343$

d. $x = \sqrt{3}$

e. $x = 3$

f. $x = 4$

5-98. Less than one; Possible justifications: $0.1 < 0.3 < 1$, $\log(0.1) = -1$ and log1 is 0 or because you would need to raise 10 to a fractional power to get a number less than 10.

5-99. $x \approx 17.673$; Students are likely to use the guess and check method or graphing.

5-100. See below:

a. $(2x + 1)(2x - 1)$

b. $(2x + 1)^2$

c. $(2y + 1)(y + 2)$

d. $(3m + 1)(m - 2)$

5-101. See below:

a. $-1 < x < 3$

b. $x \leq 1$ or $x \geq 2$

5-102. No; $\log_3 2 < 1$ and $\log_2 3 > 1$

5-103. See below:

a. $a = \frac{y}{b^x}$

b. b is the x^{th} root of $\frac{y}{a}$ or $b = \sqrt[x]{\frac{y}{a}}$

5-104. See graphs below.