HW Solving Log and Exponential Equations

Name_____

Solve each of the following equations. *Round to the nearest hundredth.*

1.
$$6^{x+3} = 50$$

2. $(1.03)^{\frac{x}{2}-5} = 2$

3.
$$\log_4(x+10) = 3$$

4. $5\log_3 x - 2 = 8$

5. Given the function,
$$f(x) = 2\log_3(x-1)$$
, find $f^{-1}(x)$.

6. Given the function,
$$f(x) = \ln(x-8) + 2$$
, find $f^{-1}(x)$.

- 7. A radioactive substance is decaying such that 2% of its mass is lost every year. Originally there were 50 kilograms of the substance present.
 - a. Write an equation for the amount, A, of the substance left after t-years.
 - b. Find the amount of time that it takes for only half of the initial amount to remain. *Round your answer to the nearest tenth of a year.*

- 8. A population of llamas on a tropical island can be modeled by the equation, $P = 500e^{0.035t}$, where *t* represents the number of years since the llamas were first introduced to the island.
 - a. How many llamas were initially introduced at *t*=0. Show the calculation that leads to your answer.

b. Algebraically determine the number of years for the population to reach 600. Round your answer to the nearest tenth of a year. 9) Solve for g in the equation: $S = \frac{1}{2}gt^2$

(1)
$$\frac{S-\frac{1}{2}}{t^2}$$
 (2) $\frac{1}{2}St^2$ (3) $\frac{\frac{1}{2}S}{t^2}$ (4) $\frac{2S}{t^2}$

10) Solve for a, if $F = \frac{W}{g}a$.

(1)
$$\frac{gF}{W}$$
 (2) $\frac{WF}{g}$ (3) $\frac{W}{gF}$ (4) $\frac{g}{WF}$

11) If
$$S = \frac{1}{2}gt^2$$
, where $t > 0$, then $t = ?$

(1)
$$\frac{\sqrt{\frac{1}{2}S}}{g}$$
 (2) $\frac{2S}{g}$ (3) $\sqrt{\frac{2S}{g}}$ (4) $\frac{S}{2g}$

12) Solve for
$$b$$
, if $A = \frac{ab}{2}$.

(1)
$$2A-a$$
 (2) $A-\frac{a}{2}$ (3) $\frac{2A}{b}$ (4) $\frac{2A}{a}$

13) Given the formula $V = \frac{1}{3}\pi r^2 h$, solve for r where r > 0.

(1)
$$\sqrt{3V - \pi h}$$
 (2) $\sqrt{\frac{3V}{\pi h}}$ (3) $\frac{V}{3\pi h}$ (4) $V - 3\pi h$