Math 1050 A4.5B Solving Exponential Eq Part 2	Name

Solve for x using the properties of logs.

1. $logx + log(x-1) = log(4x)$	2. $2logx = log 2 + log(3x-4)$
3. $ln(x-\frac{1}{2}) + ln2 = 2lnx$	4. $log_4(x+2) + log_4 3 = log_4 5 + log_4(2x-3)$
5. $log_2(x^2-x-2) = 2$	6. $log_2 x + log_2(x-3) = 2$
7. $log_9(x-5) + log_9(x+3) = 1$	8. $log_5(x+1) - log_5(x-1) = 2$
9. $2^{2/log_5 x} = \frac{1}{16}$	10. $log_2(log_3 x) = 4$

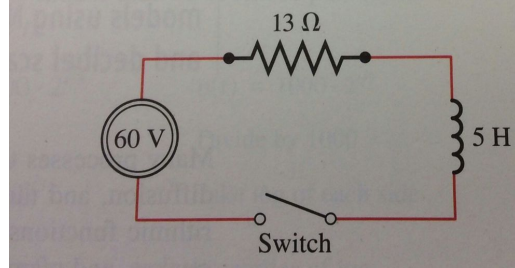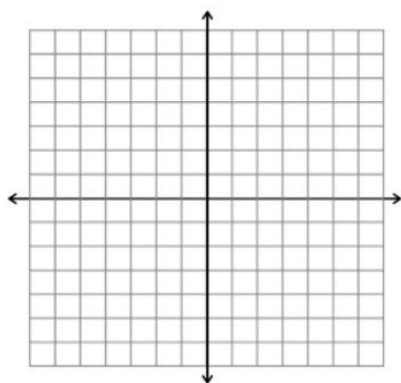|	
11. $x^2 2^x - 2^x = 0$	12. A small lake is stocked with a certain species of fish. The fish population is modeled by the function $P = \frac{10}{1+4e^{-0.8t}}$ where P is the number of fish in THOUSANDS, and t is measured in years since the lake was stocked. a. Find the fish population after 3 years. b. After how many years will the fish population reach 5000 fish?
13. Find the domain of $f(x) = log_4(5x^2 - 15x)$	14. Find the domain of $f(x) = log_2(9 - x^2)$
15. Atmospheric pressure P (in kilopascals, kPa) at altitude h (in kilometers, km) is governed by the formula $ln(\frac{P}{P_0}) = -\frac{h}{k}$ where k = 7 and $P_0 = 100kPa$ are constants. Solve the equation for P. Use part a to find the pressure P at an altitude of 4km.	16. **Electric Circuits** An electric circuit contains a battery that produces a voltage of 60 volts (V), a resistor with a resistance of 13 ohms (Ω), and an inductor with an inductance of 5 henrys (H), as shown in the figure. Using calculus, it can be shown that the current $I = I(t)$ (in amperes, A) t seconds after the switch is closed is $I = \frac{60}{13}(1 - e^{-13t/5})$. (a) Use this equation to express the time t as a function of the current I. (b) After how many seconds is the current 2 A? a. Solve for t. b. After how many seconds is the current 2A?

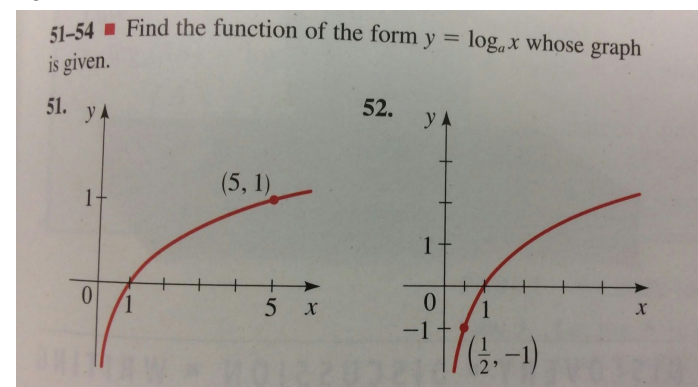| 17. You have a 50 g sample of a radioactive substance that has a half life of 3.5 days. How many days until you only have 20% of your substance left?	18. The velocity of a sky diver t seconds after jumping is given by $v(t) = 80(1 - e^{-0.2t})$. After how many seconds is the velocity 70 ft/s?

19. Graph the following.

$f(x) = 3 - 4^x$

$g(x) = ln(x + 5)$

State their domains and ranges and asymptotes.

20.

51-54 ■ Find the function of the form $y = \log_a x$ whose graph is given.

51.

(5, 1)

52.

$(\frac{1}{2}, -1)$

Equation for 51.

Equation for 52.