Math 1050- A4.4 Laws of Logarithms	Name

1-4 Use the law of logarithms to evaluate.

1. $log_3 \sqrt{27}$	2. $log_2 160 - log_2 5$
3. $log_3 100 - log_3 18 - log_3 50$	4. $log \frac{1}{\sqrt{1000}}$

Use the Laws of Logarithms to expand the expression.

5. $log_2(x(x-1))$	6. $log_4 \frac{y}{y+3}$
7. $log_6 \sqrt[4]{17}$	8. $log_5 \sqrt[3]{x^2+1}$
9. $log_2(AB^2)$	10. $log_a(\frac{x^2}{yz^3})$
11. $log\sqrt{\frac{x^2+4}{(x^2+1)(x^3-7)^2}}$	12. $ln(\frac{x^3\sqrt{x-1}}{3x+4})$

13-15.Use the Laws of Logarithms to combine the expressions.

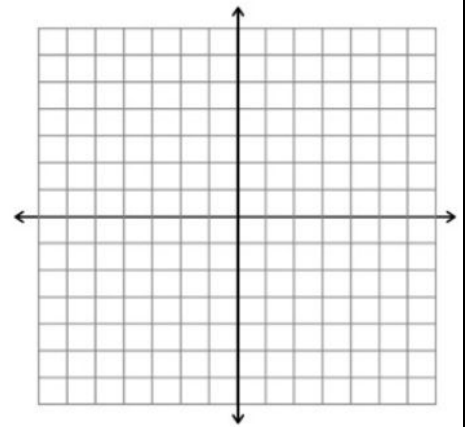|	
13. $log12 + \frac{1}{2}log7 - log2$	14. $4logx - \frac{1}{3}(x^2+1) - 2log(x-1)$

15. $2(\log_5 x + 2\log_5 y - 3\log_5 z)$	16. Solve $e^{2x} + 4e^x - 21 = 0$

17. Write an equation and then solve. Two mice get in your shed. They double every 2 weeks. (month, Number of mice) Equation: How many mice are in your shed in 6 months? How many months until there are 500 mice?	18. An alcohol has a half-life of 11 days. You buy a container containing 150 mg, but open it and leave the lid off. Equation. How much is left in the container in a month? How long until there is only 5 mg left in the container?

19. The bird population of a certain species is limited by the type of habitat required for nesting. The population behaves according to the logistic growth model. $$n(t) = \frac{5600}{0.5 + 27.5e^{-0.044t}}$$ a. Find the initial population of the bird population. b. How many will there be in 5 years? c. How long until there are only 212 birds?	20. You invest \$6000 in an account that has an annual interest rate of 6.75% compounded monthly. How long until your account doubles in value?

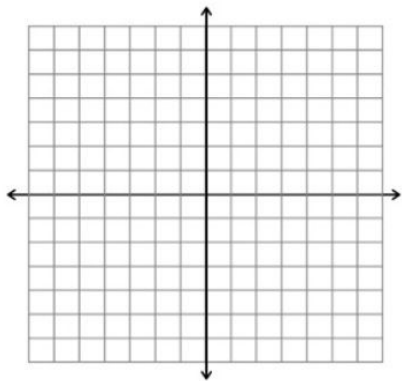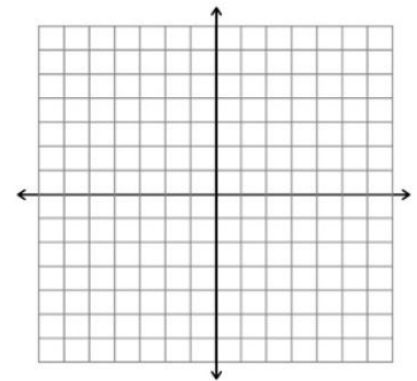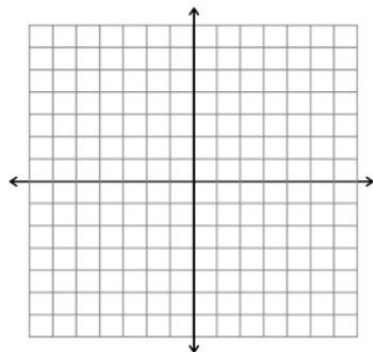|	
21. Graph $y = e^x$ and $y = e^{x+4} - 5$ Then state the domain and range & Asymptote: Domain: Range: Asymptote equation:	22. Graph $y = log\ _3x$ and $y = 2 + log\ _3(-x)$ Then state the Domain and Range & Asymptote: Domain: Range: Asymptote equation:
23. Graph $y = 3^x$ and $y = -2(3)^x$ Then state the domain and range & Asymptote: Domain: Range: Asymptote equation:	24. Find the inverse of $f(x) = 4^x - 3$ and then graph the function, the inverse function and the line y = x. Is the function one-to-one?
25. Find the inverse of $f(x) = \frac{4x+13}{x+2}$ Then graph the function the inverse function and the line y = x. Is the function one-to-one? 	26. Isolate the Log, and then Evaluate $3log\ _2x - 6 = 9$
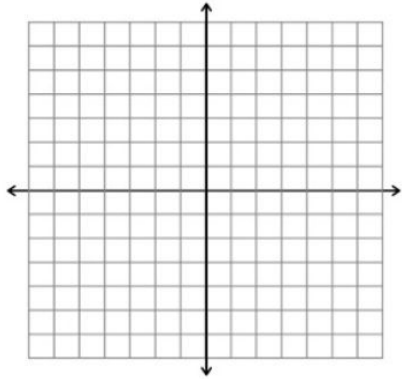
27. Graph the following

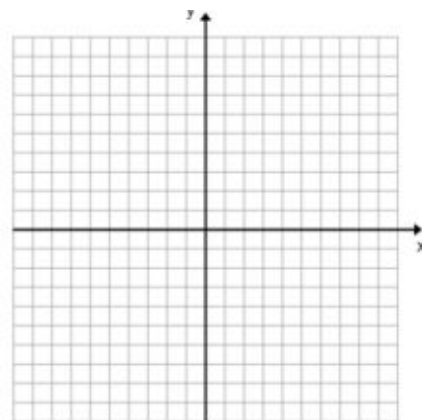$$f(x) = \frac{4x^2 - 17x + 18}{x^2 + 3x - 10}$$
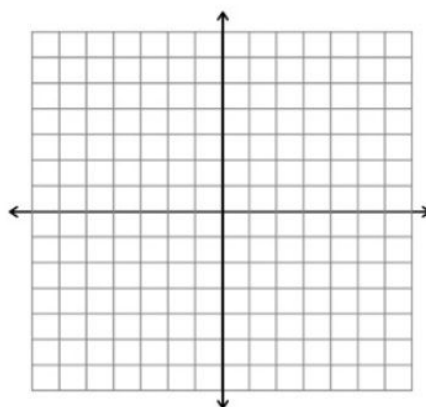
VA

HA

x-intercept(s)

y-intercept(s)

Slant Asy

28. Find all zeros then graph:

$$P(x) = x^5 - x^4 - 5x^3 + x^2 + 8x + 4$$

29. Graph $f(x) = -\log_6(x + 5)$

Domain:

Range

Asymptote: