

Algebra 2/Trig Honors
Exponential and Logarithmic Functions

Name _____

Write each in exponential form.

1. $\log_3 81 = 4$

2. $\log_e \frac{1}{e^4} = -4$

Write each in logarithmic form.

3. $2^5 = 32$

4. $\left(\frac{1}{3}\right)^{-3} = 27$

Solve.

5. $\log_5 25 = x$

6. $\log_x 64 = 2$

7. $\log_2 x = -6$

8. $\log_5 \sqrt[3]{\frac{1}{25}} = x$

9. $\log_9 x = -\frac{3}{2}$

10. $\log_x \frac{9}{16} = -2$

11. $\left(\frac{1}{4}\right)^x = 64$

12. $9^{2x} = 27^{3-4x}$

13. $8(3^{6-x}) = 40$

$$14. \log_2 x^2 = \log_2(3x + 10)$$

$$15. \log_2 \sqrt{x + 1} = 3$$

$$16. \log_3(3x - 8) = \log_3 4x$$

$$17. \log_3 x - \log_3(x - 5) = \log_3 6$$

$$18. \log_7(x^2 + 7) = \frac{2}{3} \log_7 64$$

$$19. \log_6(x + 1) + \log_6 x = 1$$

$$20. e^{2x} = e^{x^2-8}$$

$$21. e^{2x} + 9e^x - 36 = 0$$

22. $\log_2(3x + 5) - \log_2(x - 5) = \log_2 8$

23. $2 \log_3 x - \log_3(x - 2) = 2$

24. $\log 2 + \log(3x + 8) - 1 = \log(x + 1)$

25. $\log_2(4x^2 - 4) - 5 = \log_2 3$

26. Use the properties of logs to expand the logarithm. $\log_4(x^3y^5)$

27. Use the properties of logs to condense into a single logarithm. $3\log_2 x + \log_2 5 - \log_2 6$

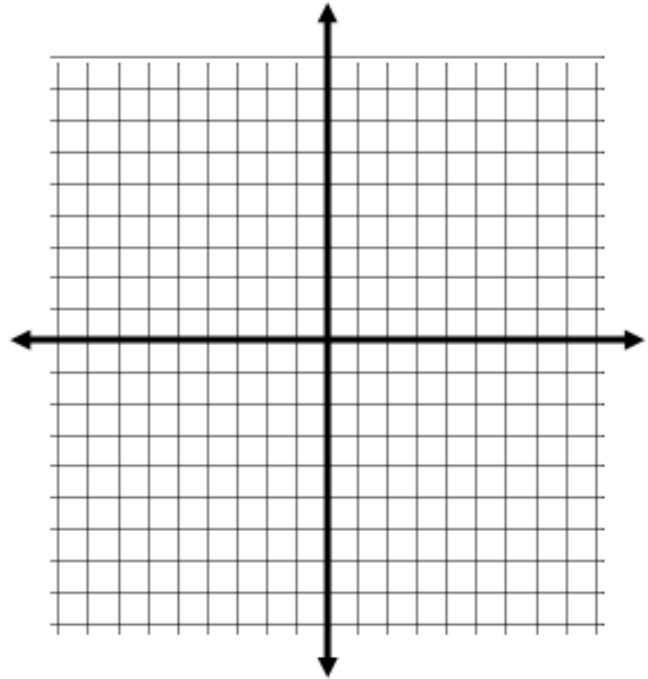
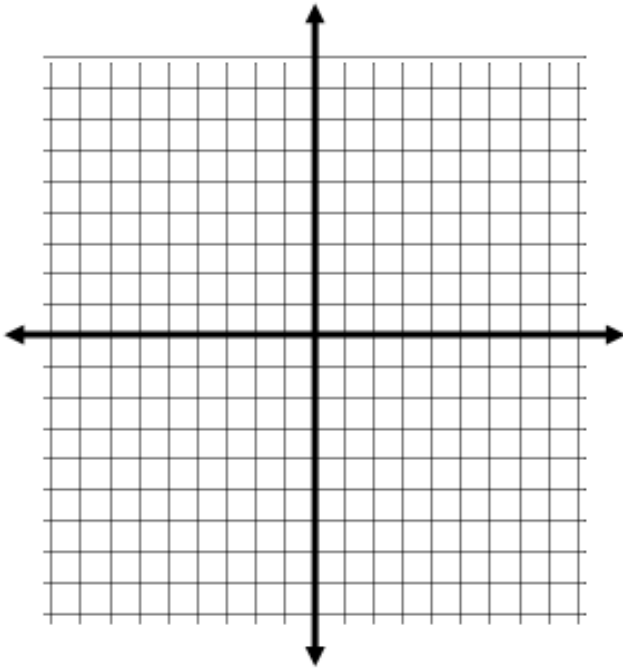
28. A total of \$3,000 is invested at an annual interest rate of 4.5%. Find the balance after 10 years if it is compounded a) quarterly, b) monthly and c) continuously.

Use the formulas $A = P\left(1 + \frac{r}{n}\right)^{nt}$ and $A = Pe^{rt}$

Graph each function. State the domain and the asymptote.

29. $f(x) = -2^{-x-3} + 5$

30. $g(x) = -\log_2(x - 4) + 2$



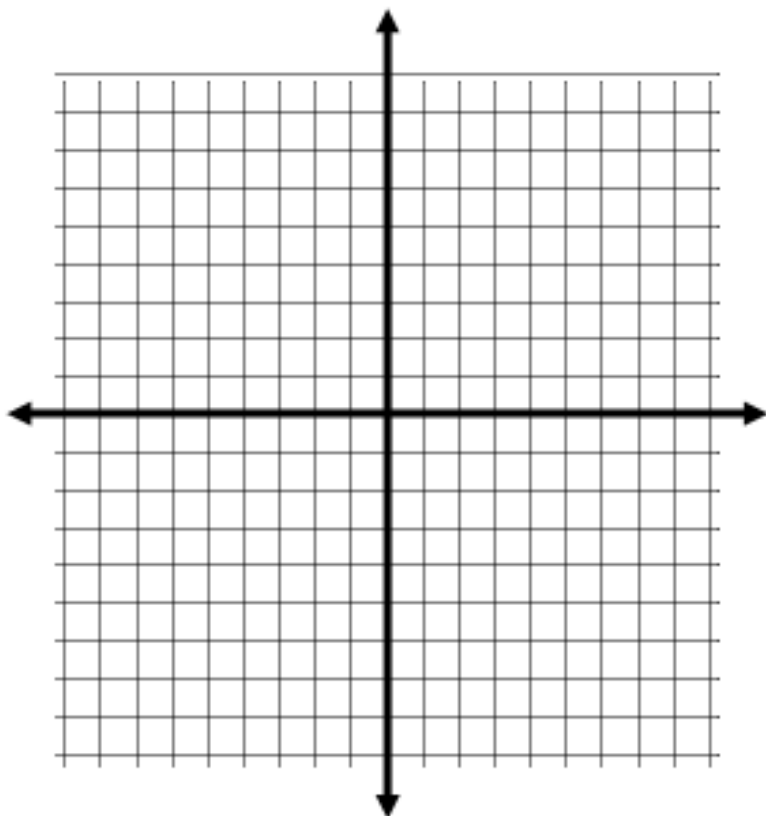
Domain: _____

Domain: _____

Asymptote: _____

Asymptote: _____

31. Find the inverse of $g(x) = 3^{x-2} + 4$. Graph both functions. $g^{-1}(x) =$



32. Find the inverse of $h(x) = 2^{x+3} - 3$. Graph both functions. $h^{-1}(x) =$

