Unit 8 Review - Exponents and Logarithms   NAME _____

Converting Between Logarithmic and Exponential Forms

Rewrite in logarithmic form.

1. $6^3 = 216$

2. $7^2 = 49$

3. $\frac{1}{25} = 5^{-2}$

Rewrite in exponential form.

4. $\log_3 9 = 2$

5. $\log 1000 = 3$

6. $\ln 7 = 1.95$

Evaluating Logarithms

Evaluate each expression. Round to two decimal places, following the rules of rounding.

7. $\log_2 8$

8. $\log 56$

9. $\ln 12$

Solving Logarithmic Equations

Solve for x. Apply a property of logarithms when needed.

10. $\log_9 x = 2$

11. $\ln (x + 1) = 9$

12. $\log_3 (2x + 7) = 4$

13. $\ln (2x - 8) - 1 = 3$

14. $\log_x 16 = 2$

15. $\log_4 3x^2 + \log_4 2x = 4$

16. $\log_8 (6x - 4) = \log_8 (2x + 12)$

17. $\log x^2 - \log 3x = 2$

Solving Exponential Equations
Solve for x.

18. $5^x = 22$

19. $e^{3x} = 11$

20. $3^{2x} - 6 = 17$
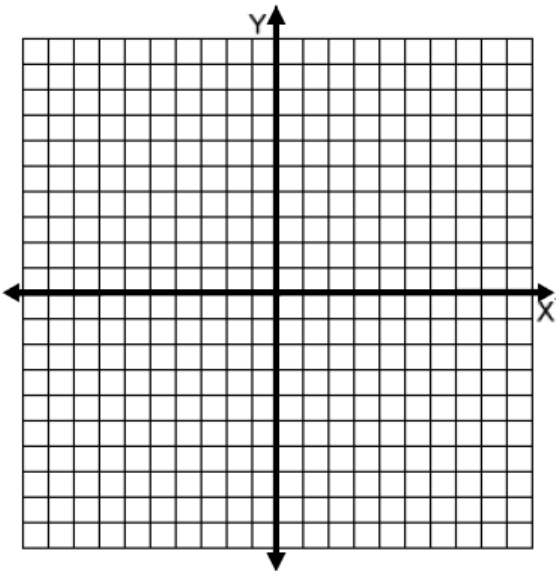
21. $7^{x+3} = 40$

22. $2 \cdot 9^{3x-8} = 100$

23. $10^x = 4^{2x-3}$

Graphs of Exponential and Logarithmic Functions
Graph each function by using your calculator to generate the t-table. State the domain, range, and asymptote.
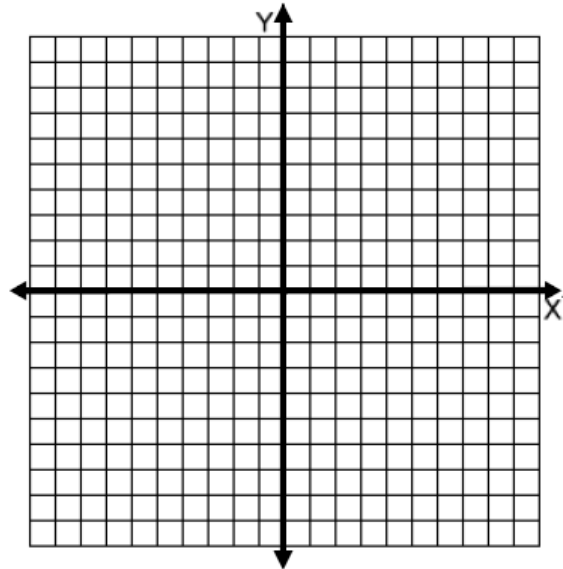
24. $f(x) = 2^x - 4$

25. $f(x) = log_4(x - 1)$

Domain:

Range:

Horizontal Asymptote:

Domain:

Range:

Vertical Asymptote:

Growth and Decay

26. The number of bacteria present in a colony is 180 at 11 a.m. and the number of bacteria doubles every hour. How many will be present at 8 p.m.?

27. If a gallon of milk costs $3 now and the price is increasing by 10% each year, how long before milk costs $10 per gallon?

28. Dinner at your grandfather's favorite restaurant now costs $25.25 and has been increasing steadily at 4% per year. How much did it cost 50 years ago when he was dating your grandmother?

29. The value of an iPod purchased for $300 decreases by 6% each year. How long until the iPod is worth $90?

Compound Interest

30. How much money will be available in 7 years if $400 is invested at 3% interest compounded continuously?

31. How long will it take for $600 to double if it is invested at 4% interest compounded monthly?

32. How much money must be invested at 6.5% interest compounded quarterly for $50,000 to be available in 7 years?

33. How long will it take to have $1400 if $900 is invested at 7% interest compounded continuously?