Unit 4 Review - Exponentials and Logarithms NAME _____

Rewrite in Logarithmic and Exponential Form

Rewrite each logarithm in exponential form.

1. $log_2 16 = 4$
2. $log 100 = 2$
3. $5 = log_3 243$

Rewrite each exponential in logarithmic form.

4. $5^2 = 25$
5. $6561 = 9^4$
6. $3^3 = 27$

Evaluate Logarithms

Evaluate each logarithm. Round to two decimal places.

7. $log_5 68$
8. $log\ 66$
9. $ln\ 17$

Solve Logarithmic Equations

Solve each logarithmic equation. Apply properties as needed!

10. $log_5 x = 3$
11. $log_6(4x + 12) = 3$
12. $log_4(8x + 3) = log_4(2x + 15)$

13. $log_3(x + 5) + log_3 4 = 6$
14. $log_9 8x^3 - log_9 2x^2 = 1$

Solve Exponential Equations

Solve each exponential equation.

15. $6^x = 19$

16. $7 \cdot 19^{4x} + 20 = 300$

17. $5^{x-3} = 18$

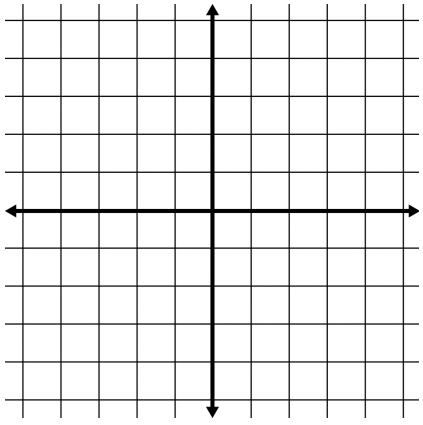
18. $e^{4x-5} = 3$

19. $.037 = 9^{7x-2}$

Graphs of Exponential Functions

Graph each exponential function. State the domain, range, and asymptote.

20. $f(x) = 2^x - 4$

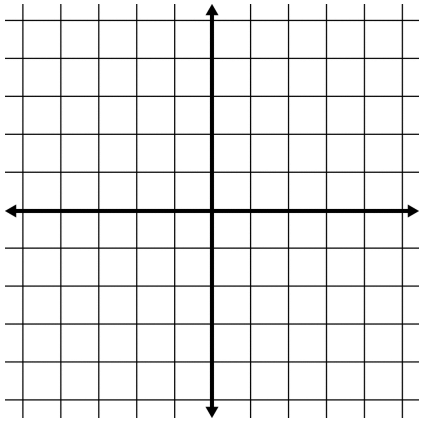


domain:

range:

asymptote:

21. $f(x) = \frac{1}{3} \cdot 3^x$



domain:

range:

asymptote:

Growth and Decay

22. In 1990, there were 2458 students who successfully completed Math 3. If the success rate for completing Math 3 increases by 2% each year, how many years will it take before 2728 students successfully complete Math 3?

23. A population of bumblebees increases every year by 45%. There are currently 50,000 bumblebees in the population. How many bumblebees were in the population 19 years earlier?

24. On Monday, your teacher gives you a list of twenty words to be memorized. You memorize all of them Monday night and do not look at the list again. If you forget 3% of the list each day, how many words will you remember 3 days later?

Compound Interest

25. Find the amount owed at the end of 4 years if $4700 is loaned at a rate of 10% interest compounded semiannually.

26. What amount will an account have after 10 years if $125 is invested at 7.5% interest compounded continuously?

27. Determine the amount that must be invested at 7% interest compounded monthly, so that $400,000 will be available for retirement in 10 years.

28. What amount invested at 6% interest compounded continuously for 4 years will yield $700?

29. How long does it take $700 to double if it is invested at 5% interest compounded quarterly?

30. If $600 is invested at 4% interest compounded continuously, how long will it take before the amount is $900?