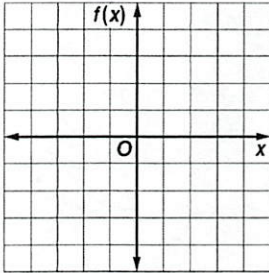


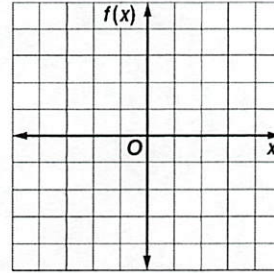
## Mid-Chapter Review Chapter 6

Identify the **Domain and Range** of each. Then sketch the graph.

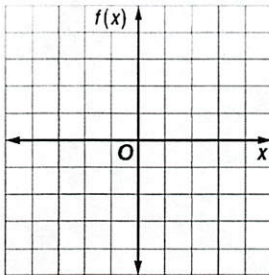
1.  $f(x) = \log_2 x$



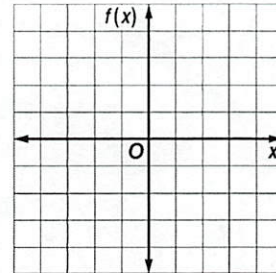
2.  $f(x) = -\log_3 (x - 1)$



3.  $f(x) = \log_4 (x - 1) + 2$



4.  $f(x) = -2\log_5 x - 1$



Rewrite each equation in exponential form.

5.  $\log_6 36 = 2$

6.  $\log_{289} 17 = \frac{1}{2}$

Rewrite each equation in logarithmic form.

7.  $64^{\frac{1}{2}} = 8$

8.  $12^2 = 144$

Evaluate each expression.

9.  $\log_5 125$

10.  $\log_3 \frac{1}{243}$

11.  $\log_{343} 7$

12.  $\log_{64} 4$

Expand each logarithm. Don't evaluate  
(All logarithms are common logs, base 10)

13.  $\log(3 \cdot 5)$

14.  $\log(3 \cdot 2^3)$

15.  $\log\left(\frac{2^4}{5}\right)$

16.  $\log\left(\frac{6}{5}\right)^6$

Condense each expression to a single logarithm.

17.  $\log 3 - 2 \log 8$

18.  $6 \log_3 u + 2 \log_3 v$

19.  $4 \log_4 5 - \frac{1}{2} \log_4 9$

20.  $20 \log_6 x + 5 \log_6 y$

Change of Base Formula

Use a calculator to approximate each to the nearest thousandth.

21.  $\log_2 30$

22.  $\log_4 5^3$

23.  $\log_3 3^8$

Solve each equation. Check your solutions.

24.  $\log_4 4 + \log_4 x = \log_4 72$

25.  $\log_6 6c + \log_6 3 = \log_6 126$

26.  $\log_5 2y - \log_5 4 = \log_5 3$

27.  $\log_2(q + 2) - \log_2 3 = \log_2 7$

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28.  $\log_9 4 + 2 \log_9 5 = \log_9 w$

29.  $\log_{10} x + \log_{10} (3x - 5) = \log_{10} 2$

30.  $\log_3 d + \log_3 3 = 3$

31.  $\log_{10} y - \log_{10} (2 - y) = 0$

32.  $\log_2 r + 2 \log_2 5 = 0$

33.  $\log_2 (x + 4) - \log_2 (x - 3) = 3$

Solve each equation or inequality. Round your answers to the nearest thousandth.

34.  $3^b = 17$

35.  $16^v = 67$

36.  $5(18)^x = 26$

37.  $3^y - 6 = 5$

38.  $9^{n+10} + 3 = 81$

39.  $11^{n-8} - 5 = 54$

40.  $-6(2)^{8r+8} + 5 = -19$

41.  $36^p = 216^{5-p}$

42.  $(13)^{x^2} = 33.3$

43.  $9^{b+2} = 27^b$

44.  $5^x \geq 42$

45.  $9^{2a} < 120$

46.  $3^{4x} \leq 72$

47.  $7^{6n} > 49^{2n+3}$

48.  $3^{y-1} \leq 9^y$

49.  $125^p \geq 25^{p-2}$

50. Find the values of  $\log_3 27$  and  $\log_{27} 3$   
Find the values of  $\log_2 32$  and  $\log_{32} 2$   
Make and prove a conjecture about the relationship between  $\log_a b$  and  $\log_b a$