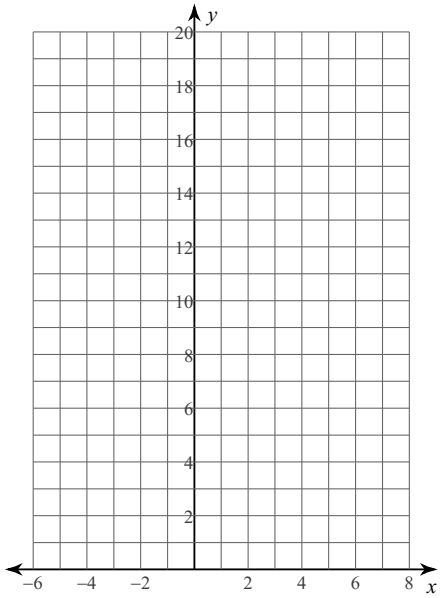
Algebra 2 Name_____ ID: 1

Chapter 7 Review

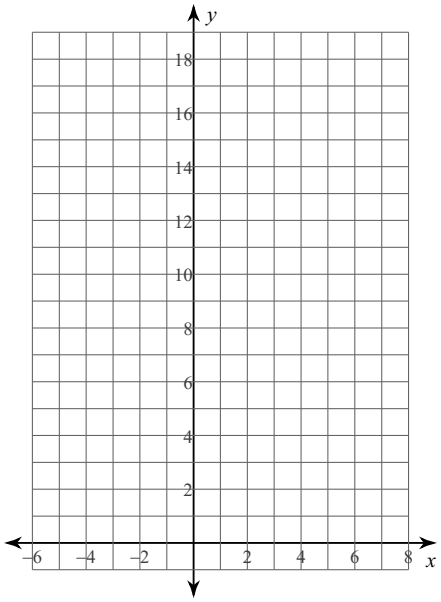
Date_____ Period____

Sketch the graph of each function.

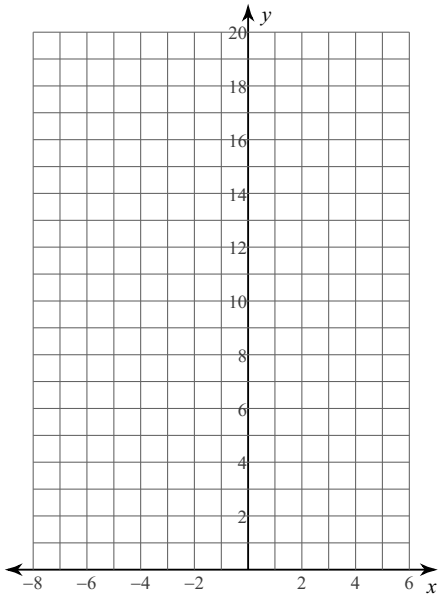
1) $y = 3^{x-1}$



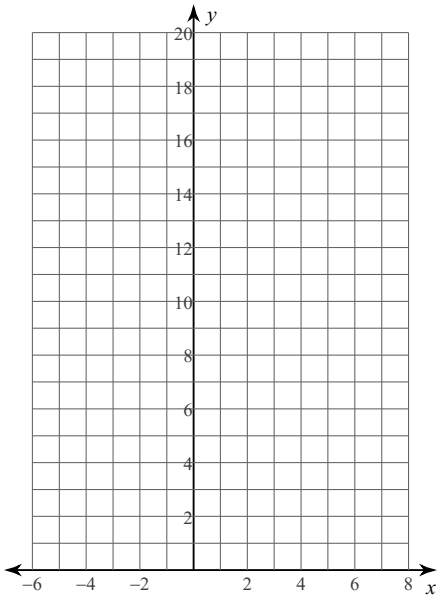
2) $y = \left(\frac{1}{4}\right)^{x-1} - 1$



3) $y = 4 \cdot \left(\frac{1}{2}\right)^{x+1} + 2$



4) $y = 4 \cdot 2^{x-1} + 1$



Evaluate each expression.

5) $\log_7 343$

6) $\log_6 \frac{1}{36}$

7) $\log_3 1$

8) $\log_7 \frac{1}{343}$

9) $\log_4 4$

10) $\log_3 243$

11) $\log_{27} 3$

12) $\log_7 343$

Find the inverse of each function.

13) $y = \log_4 x - 3$

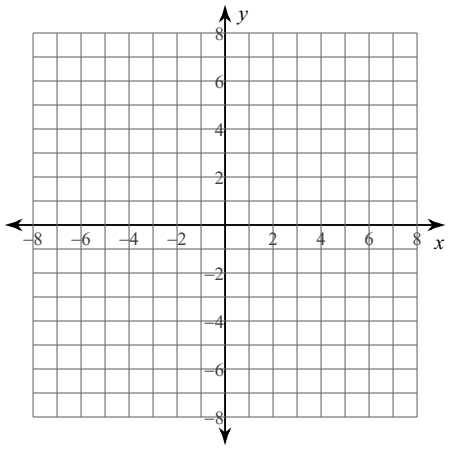
14) $y = \log_6 (-4x)$

15) $y = -9\log_5 x^4$

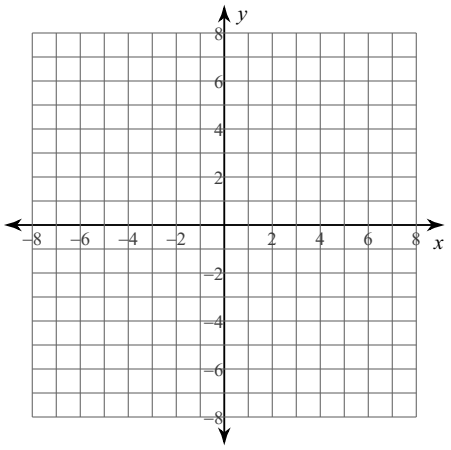
16) $y = \log_4 (-2x) - 6$

Identify the domain and range of each. Then sketch the graph.

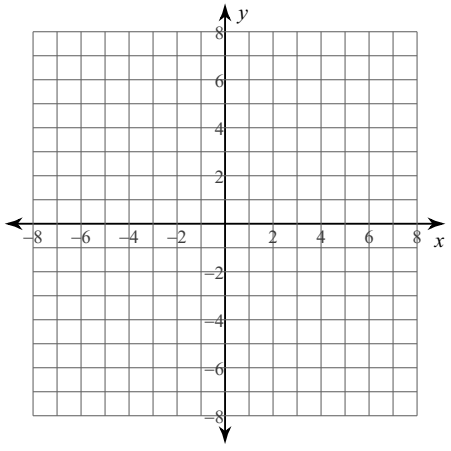
17) $y = \log (x - 1) - 1$



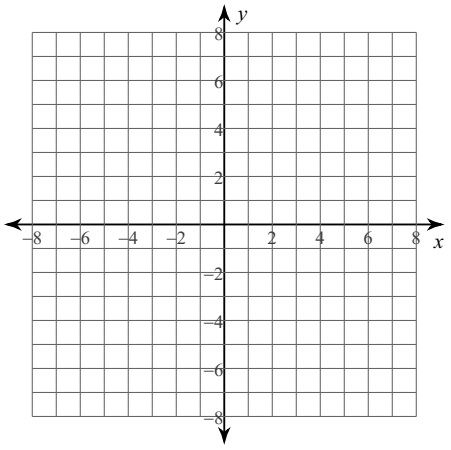
18) $y = \log (x - 2) + 4$



19) $y = \log (x - 1) + 4$



20) $y = \log_4 (x - 1) - 1$



Expand each logarithm.

21) $\log (a \cdot b)$

22) $\log x^2$

23) $\log \sqrt{x}$

24) $\log \frac{a}{b}$

25) $\log_7 \sqrt{x \cdot y \cdot z}$

26) $\log_8 (xy^3)^6$

27) $\log_7 (u^6 v^6)$

28) $\log_6 (xy^3)^4$

Condense each expression to a single logarithm.

29) $3 + 4\log_2 11 + 6\log_2 7$

30) $18\log_3 z + 18\log_3 x - 6\log_3 y$

31) $5\log_2 11 + 5\log_2 7 - 30$

32) $6\log_4 u - \log_4 w - 5\log_4 v$

Use a calculator to approximate each to the nearest thousandth.

33) $\ln 1.3$

34) $\log_5 60$

35) $\log_5 35$

36) $\log_5 6$

Solve each equation.

37) $81^{2x} = 3^5$

38) $4^{-n-3} = 2^4$

39) $3^{3-3b} = 3^{-2b}$

40) $7^{3v} = \frac{1}{343}$

41) $\log 20 = \log (2x - 8)$

42) $\log (-4n - 5) = \log -3n$

43) $8 \log_9 (r - 3) = 32$

44) $8 \log_2 (m + 2) = -8$

45) $\log_2 5x^2 - \log_2 5 = 2$

46) $\log_5 (x^2 + 9) - \log_5 2 = \log_5 45$

47) $\log_5 (x + 5) - \log_5 x = \log_5 30$

48) $\log_3 (x + 6) - \log_3 x = 1$

49) You deposit $3,000 in a bank account. Find the balance after 5 years for each situation:
a) The account pays 4% annual interest compounded quarterly
b) The account pays 3.5% annual interest compounded monthly.

50) You buy a car for $14,000. The value of the car decreases by 16% each year. What will the value of the car be in 5 years?

51) You deposit $2000 in an account that pays 7% annual interest compounded continuously. What is the balance after 3 years?

52) The slope of the beach is related to the average diameter (d) of the sand particles on the beach by the formula: $s = 0.159 + 0.118 \log d$. Find the slope of a beach if the average diameter of the sand particles is 0.132 millimeters.

Chapter 7 Review

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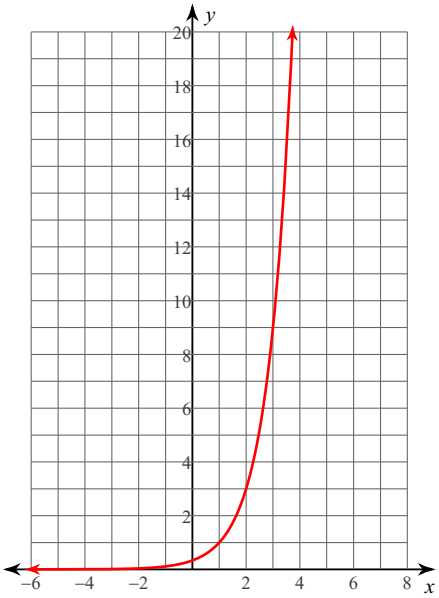
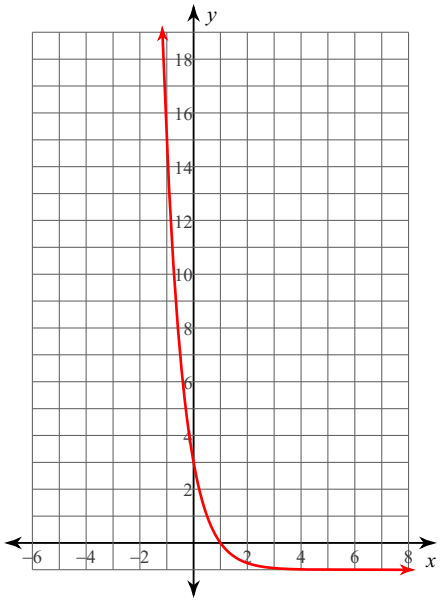
Sketch the graph of each function.

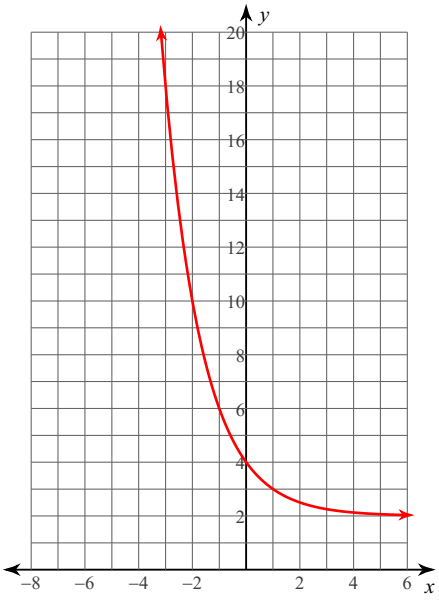
1) $y = 3^{x-1}$



2) $y = \left(\frac{1}{4}\right)^{x-1} - 1$



3) $y = 4 \cdot \left(\frac{1}{2}\right)^{x+1} + 2$



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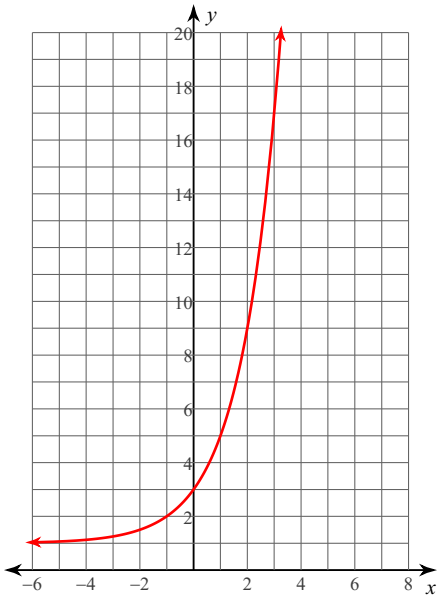


Evaluate each expression.

5) $\log_7 343$

3

6) $\log_6 \frac{1}{36}$

−2

7) $\log_3 1$ 0

8) $\log_7 \frac{1}{343}$ −3

9) $\log_4 4$ 1

10) $\log_3 243$ 5

11) $\log_{27} 3$ $\frac{1}{3}$

12) $\log_7 343$

3

Find the inverse of each function.

13) $y = \log_4 x - 3$

$y = 4^{x+3}$

14) $y = \log_6 (-4x)$

$y = -\frac{6^x}{4}$

15) $y = -9\log_5 x^4$

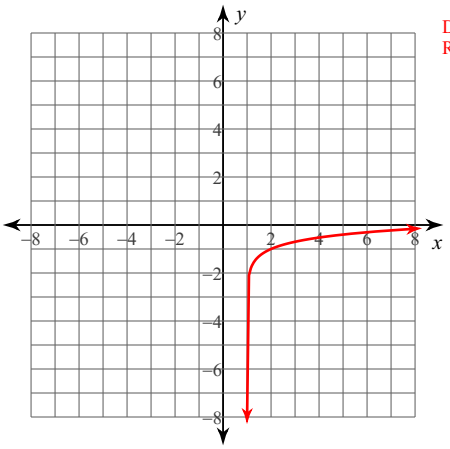
$y = \left(5^{-\frac{x}{9}}\right)^{\frac{1}{4}}$

16) $y = \log_4 (-2x) - 6$

$y = \frac{4^{x+6}}{-2}$

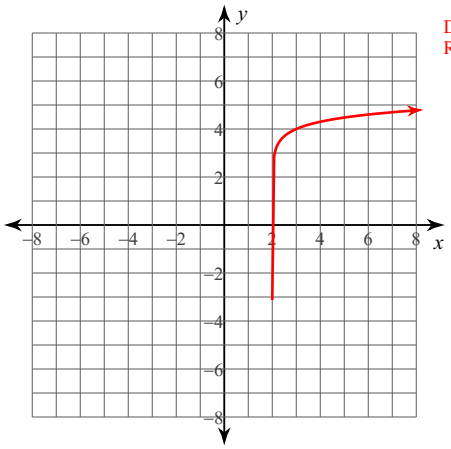
Identify the domain and range of each. Then sketch the graph.

17) $y = \log (x - 1) - 1$



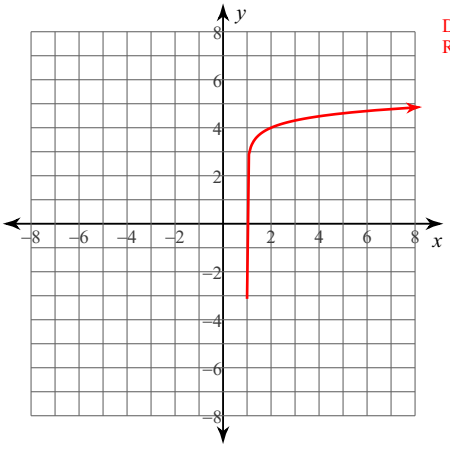
Domain: $x > 1$
Range: All reals

18) $y = \log (x - 2) + 4$



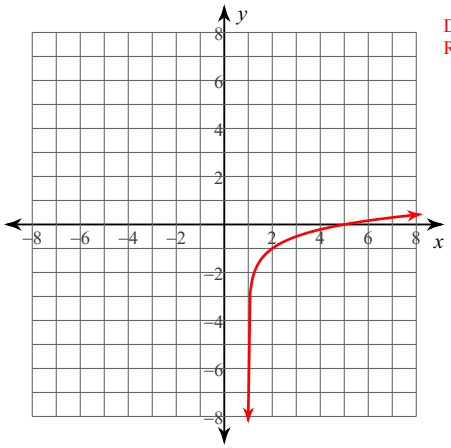
Domain: $x > 2$
Range: All reals

19) $y = \log (x - 1) + 4$



Domain: $x > 1$
Range: All reals

20) $y = \log_4 (x - 1) - 1$



Domain: $x > 1$
Range: All reals

Expand each logarithm.

21) $\log (a \cdot b)$

$\log a + \log b$

22) $\log x^2$

$2 \log x$

23) $\log \sqrt{x}$

$\frac{\log x}{2}$

24) $\log \frac{a}{b}$

$\log a - \log b$

25) $\log_7 \sqrt{x \cdot y \cdot z}$

$\frac{\log_7 x}{2} + \frac{\log_7 y}{2} + \frac{\log_7 z}{2}$

26) $\log_8 (xy^3)^6$

$6 \log_8 x + 18 \log_8 y$

27) $\log_7 (u^6 v^6)$

$6 \log_7 u + 6 \log_7 v$

28) $\log_6 (xy^3)^4$

$4 \log_6 x + 12 \log_6 y$

Condense each expression to a single logarithm.

29) $3 + 4 \log_2 11 + 6 \log_2 7$

$\log_2 (8 \cdot 7^6 \cdot 11^4)$

30) $18 \log_3 z + 18 \log_3 x - 6 \log_3 y$ $\log_3 \frac{z^{18} x^{18}}{y^6}$

31) $5 \log_2 11 + 5 \log_2 7 - 30$

$\log_2 \frac{7^5 \cdot 11^5}{8^{10}}$

32) $6 \log_4 u - \log_4 w - 5 \log_4 v$ $\log_4 \frac{u^6}{wv^5}$

Use a calculator to approximate each to the nearest thousandth.

33) $\ln 1.3$

0.262

34) $\log_5 60$

2.544

35) $\log_5 35$

2.209

36) $\log_5 6$

1.113

Solve each equation.

37) $81^{2x} = 3^5$

$\left\{\frac{5}{8}\right\}$

38) $4^{-n-3} = 2^4$

$\{-5\}$

39) $3^{3-3b} = 3^{-2b}$

$\{3\}$

40) $7^{3v} = \frac{1}{343}$

$\{-1\}$

41) $\log 20 = \log (2x - 8)$

$\{14\}$

42) $\log (-4n - 5) = \log -3n$

$\{-5\}$

43) $8 \log_9 (r - 3) = 32$

$\{6564\}$

44) $8 \log_2 (m + 2) = -8$

$\left\{-\frac{3}{2}\right\}$

45) $\log_2 5x^2 - \log_2 5 = 2$

$\{2, -2\}$

46) $\log_5 (x^2 + 9) - \log_5 2 = \log_5 45$

$\{9, -9\}$

47) $\log_5 (x + 5) - \log_5 x = \log_5 30$

$\left\{\frac{5}{29}\right\}$

48) $\log_3 (x + 6) - \log_3 x = 1$

$\{3\}$

49) You deposit $3,000 in a bank account. Find the balance after 5 years for each situation:
a) The account pays 4% annual interest compounded quarterly
b) The account pays 3.5% annual interest compounded monthly.

a. $3,660.57 b. $3,572.83

50) You buy a car for $14,000. The value of the car decreases by 16% each year. What will the value of the car be in 5 years?

$5,854.97

51) You deposit $2000 in an account that pays 7% annual interest compounded continuously. What is the balance after 3 years?

$2,467.36

52) The slope of the beach is related to the average diameter (d) of the sand particles on the beach by the formula: $s = 0.159 + 0.118 \log d$. Find the slope of a beach if the average diameter of the sand particles is 0.132 millimeters.

0.055