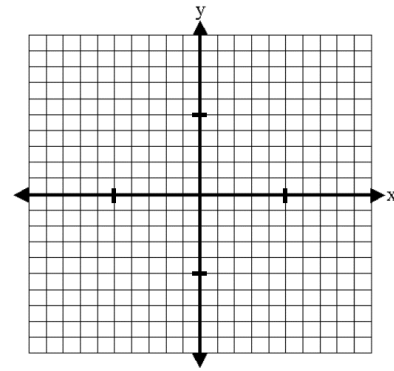
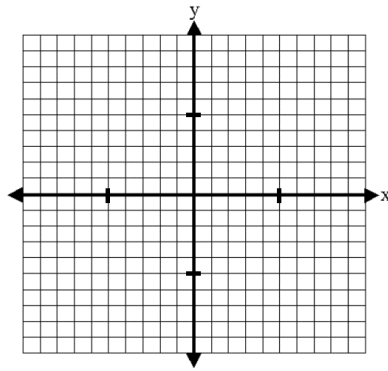
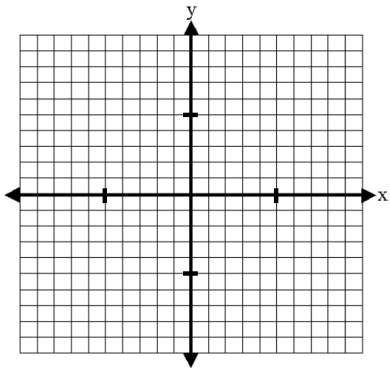


Identify the following for each function: x-intercept, y-intercept, and asymptote. Then graph the function and state the domain and range.

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

2. $f(x) = \log(x) - 3$

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

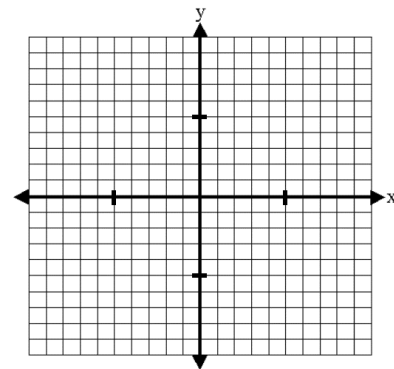
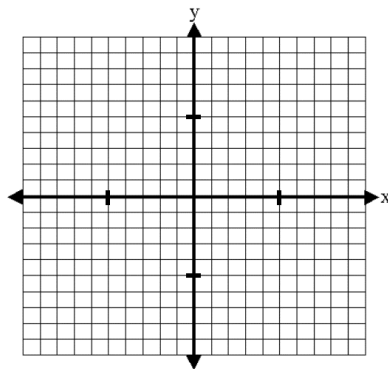
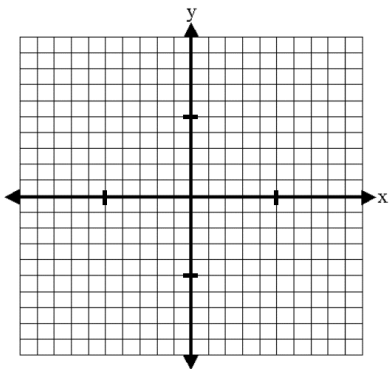


Identify the following for each function: x-intercept, y-intercept, and asymptote. Then graph the function and state the domain and range.

4. $f(x) = 2^{x-1}$

5. $f(x) = 3^x - 4$

6. $f(x) = 2^{x+3} + 4$



For numbers 7 through 9, determine whether the data in the table can be modeled by a linear function or exponential function. Then write the equation that represents the function.

7.

x	1	2	3	4	5
F(x)	7	14	28	56	112

8.

x	1	2	3	4	5
F(x)	5	10	15	20	25

9.

x	1	2	3	4	5
F(x)	320	0	20	5	$\frac{5}{4}$

For 10 through 12, write the transformations of the function compared to the parent function $(x) = 2^x$.

10. $g(x) = -2^x + 4$

11. $h(x) = 3 \cdot 2^{x-1}$

12. $r(x) = 2^{x+4} - 9$

For 13 through 15, write the transformations of the function compared to the parent function $(x) = \log x$.

13. $g(x) = -\log(x + 12)$

14. $h(x) = 5 \log(x) - 2$

15. $r(x) = \log(x - 4) + 1$

Convert each logarithm to an exponential expression.

16. $\log_2 x = 4$

17. $\log 3 = a$

18. $\log_5(x - 1) = 3$

Convert each exponential expression to a logarithm.

19. $2^x = 5$

20. $e^{2x} = 3$

21. $10^y = 12$

Condense each expression to a single log.

22. $\log a - \log b$

23. $3 \log x + 4 \log y$

24. $2 \log x + \log y - 3 \log z$

25. $\log(2x)$

26. $\log\left(\frac{2y}{5}\right)$

27. $\log\left(\frac{3y^4}{x^5}\right)$

Solve the following equations:

28. $6^{2x} - 5 = 45$

29. $2^{3x-1} = 32$

30. $\log(2x - 1) = \log(8x + 14)$

31. $\log_2(3x + 1) = 3$

Complete the expression for each composition.

32. $f(x) = 5^x$

$f(g(x)) = \underline{\hspace{2cm}} = x$

$g(f(x)) = \underline{\hspace{2cm}} = x$

33. $f(x) = \log_4 x$

$f(g(x)) = \underline{\hspace{2cm}} = x$

$g(f(x)) = \underline{\hspace{2cm}} = x$

Find the inverse of each function and then state the domain and range of each function.

34. $f(x) = \log_e x$

35. $f(x) = 7^x$

Unit 5

1. Simplify $\frac{x^2-7x-30}{x^2-5x-24}$

2. Simplify $\frac{x^2+8x+12}{x^2+3x-18}$

3. Simplify $\frac{2x^2+10x-48}{8x+64}$

4. Simplify $\frac{x^2+3x-28}{x^2-49}$

5. Simplify each expression

a) $\frac{3}{x+7} + \frac{4}{x-8}$

b) $\frac{7x}{x+1} + \frac{8}{x-7}$

c) $\frac{6}{x-1} - \frac{5x}{4}$

6. Solve the equation. $\frac{4}{x-2} + \frac{1}{4x} = \frac{6}{x}$

7. Solve the equation. $\frac{x+5}{x+8} = 1 + \frac{6}{x+1}$

8. Solve the equation. $\frac{x-3}{x-1} - \frac{2}{x+1} = \frac{x-5}{x^2-1}$

9. Solve the equation. $\frac{3}{x+1} + \frac{2}{x-4} = \frac{4x-11}{x^2-3x-4}$

10 Identify any horizontal or vertical asymptotes or holes in the graph.

a) $f(x) = \frac{x-2}{x-4}$

b) $f(x) = \frac{2x+4}{x^2-4}$

Vertical Asymptote: _____

Vertical Asymptote: _____

Horizontal Asymptote: _____

Horizontal Asymptote: _____

Hole(s): _____

Hole(s): _____

11. Describe each function $g(x)$ as a transformation of $f(x) = \frac{1}{x}$.

a) $g(x) = \frac{5}{x} - 7$

b) $3 + \frac{1}{x-2}$

c) $-\frac{4}{x+1} - 6$

12. Solve $\sqrt[3]{3x+4} - 1 = 26$

13. Solve $\sqrt[3]{2x-7} - 2 = 3$

14. State the vertical asymptote(s), hole(s), and horizontal asymptote for the following function: $\frac{3x^2-12x}{x^2-2x-3}$

15. Find the solution for the equation: $x = \sqrt{110-x}$. Be sure to clearly state any solution(s) and/or extraneous solution(s).

16. Solve: $4 - \sqrt[3]{x+1} = 5$

17. What are the asymptotes for $\frac{-x^2+16x-63}{x^2-2x-35}$?

18. Simplify $\frac{x^2-2x-15}{x^2-6x+5}$

19. Find the product of $\frac{8x-56}{8x+48} \cdot \frac{x^2+9x+18}{8x^2+24x}$

20. Simplify $\frac{\frac{x^2-9}{x+1}}{\frac{x-3}{x}}$. Identify any restrictions.

21. Find the quotient of $\frac{4x^2+7x+16}{x+1}$

1. Convert the following from radians to degrees.

a. $\frac{3\pi}{4}$

b. 6π

c. $\frac{11\pi}{6}$

2. Convert the following from degrees to radians.

a. 60°

b. 360°

c. $1,440^\circ$

3. Circle all of the angle measures that are coterminal with 380°

a. 680°

b. 20°

c. $\frac{\pi}{9}$

d. -360°

e. -700°

f. 6π

4. Find the values of all three trigonometric functions of θ when $\theta = 315^\circ$.

$\sin \theta =$ _____

$\cos \theta =$ _____

$\tan \theta =$ _____

5. Find the values of all three trigonometric functions of θ when $\theta = -4\pi$.

$\sin \theta =$ _____

$\cos \theta =$ _____

$\tan \theta =$ _____

6. If $\cos \theta = -\frac{5}{12}$ and θ is in the second quadrant, use the trigonometric identities to find the value of $\sin \theta$.

7. Given that $\pi < \theta < \frac{3\pi}{2}$, find the value of $\sin \theta$ and $\tan \theta$ if $\cos \theta = -\frac{2}{5}$

8. Simplify in terms of $\sin \theta$ and $\cos \theta$.

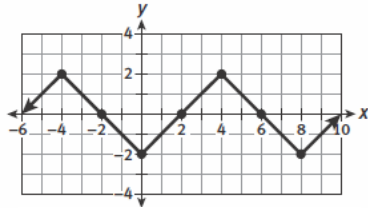
a. $\cot \theta \cdot \sin \theta$

b. $\frac{1}{\tan \theta}$

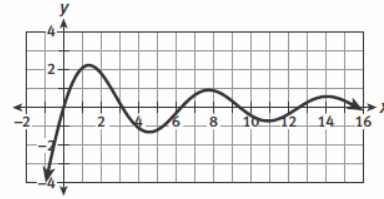
c. $\tan \theta \cdot \sin \theta$

9. Circle all of the graphs that represent a periodic function.

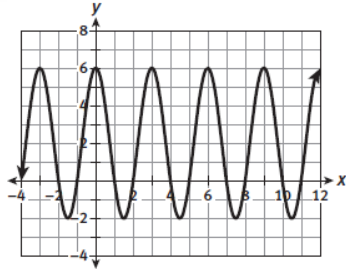
a.



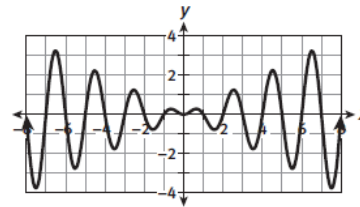
b.



c.

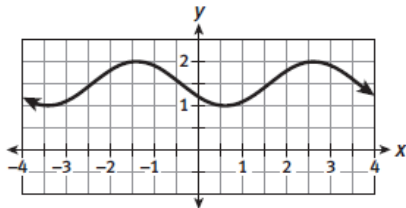


d.

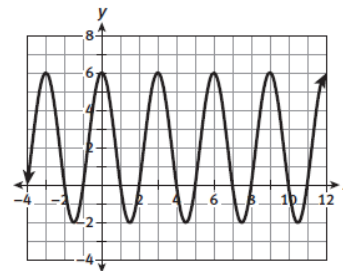


10. State the period and amplitude of each function. Then write the equation of the function.

a.



b.



11. Write the equation of a sine function that is reflected, has an amplitude of 12, and a period of 8π .

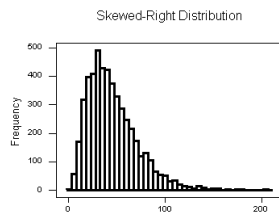
Unit 7

1. Ben is on the baseball team at his school and asks everyone if they have a part-time job. Why might his data be a poor estimate of the actual percentage of students at his school with part-time jobs?

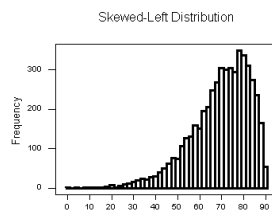
2. Name a few ways to reduce the margin of error on a survey.

3. How does the mean compare to the median in each of the following scenarios?

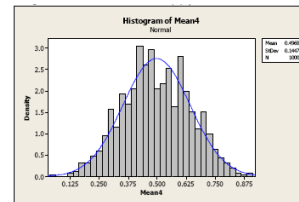
a.



b.



c.



4. The mean and standard deviation of a normally distributed data set are 75 and 20, respectively. What is the z-score of a data point whose value is 100?

5. Set up the normal curve for Question #31.

6. Jamie wants to evaluate the negative effects of computer gaming on student grades. She has decided to use the ninth-grade class as the population for her study. After some consideration, she decides to interview ninth-graders who shop in the local used-game store as a sample of the ninth-grade population. Is Jamie's sample free from bias? Why or why not?

7. A new nutritional supplement claims to increase long-distance runner endurance by 25%. A study to evaluate the claim is planned using a representative sample of 50 male and 50 female long-distance runners. A study is designed to give the supplement to 100 runners before they race in Florida. The study will compare the results to the same runners when they raced in Colorado before taking the supplement. Is this a reasonable study method? Why or why not?