

ALGEBRA 2 WITH TRIG SECOND SEMESTER REVIEW

Multiple Choice

Identify the choice that best completes the statement or answers the question.

What is the solution of the equation?

- ___ 1. $\sqrt{x+10} - 7 = -5$
a. 14 b. -8 c. 4 d. -6
- ___ 2. $-10 + \sqrt{x+8} = -4$
a. 36 b. 28 c. -2 d. 44
- ___ 3. Let $f(x) = -5x - 4$ and $g(x) = 6x - 7$. Find $f(x) + g(x)$.
a. $-11x + 3$ b. $x + 3$ c. $-11x - 11$ d. $x - 11$
- ___ 4. Let $f(x) = 3x + 2$ and $g(x) = 7x + 6$. Find $f \cdot g$ and its domain.
a. $6x^2 + 4x + 42$; all real numbers except $x = -\frac{2}{3}$
b. $6x^2 + 4x + 42$; all real numbers
c. $21x^2 + 32x + 12$; all real numbers
d. $21x^2 + 32x + 12$; all real numbers except $x = -\frac{6}{7}$
- ___ 5. Let $f(x) = x^2 - 16$ and $g(x) = x + 4$. Find $\frac{f}{g}$ and its domain.
a. $x + 4$; all real numbers except $x \neq 4$
b. $x + 4$; all real numbers except $x \neq -4$
c. $x - 4$; all real numbers except $x \neq 4$
d. $x - 4$; all real numbers except $x \neq -4$
- ___ 6. Let $f(x) = x + 2$ and $g(x) = x^2$. Find $(g \circ f)(-5)$.
a. 9 b. -3 c. 49 d. -10
- ___ 7. Is relation t a function? Is the inverse of relations t a function?

Relation t

x	0	2	4	6
y	-8	-7	-4	-4

- a. Relation t is not a function. The inverse of relation t is a function.
b. Relation t is not a function. The inverse of relation t is not a function.
c. Relation t is not a function. The inverse of relation t is a function.
d. Relation t is a function. The inverse of relation t is not a function.

What is the inverse of the given relation?

- ___ 8. $y = 3x + 9$

a. $y = \frac{1}{3}x + 3$

b. $y = 3x - 3$

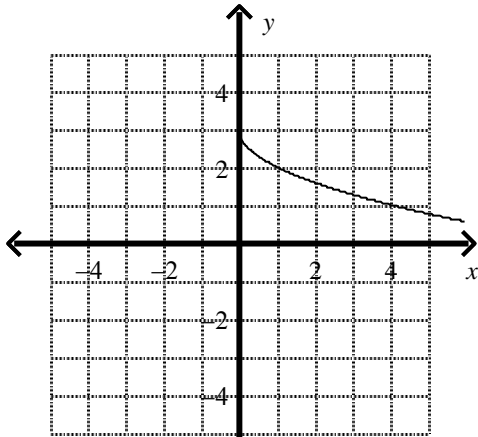
c. $y = 3x + 3$

d. $y = \frac{1}{3}x - 3$

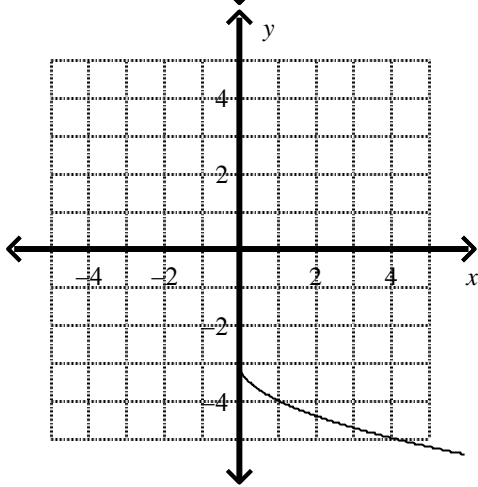
Graph the equation.

9. $y = \sqrt{x} - 3$

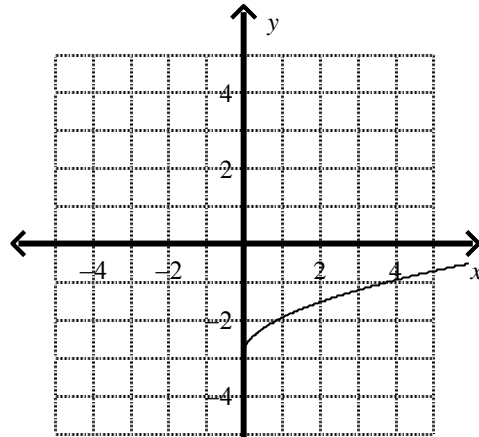
a.



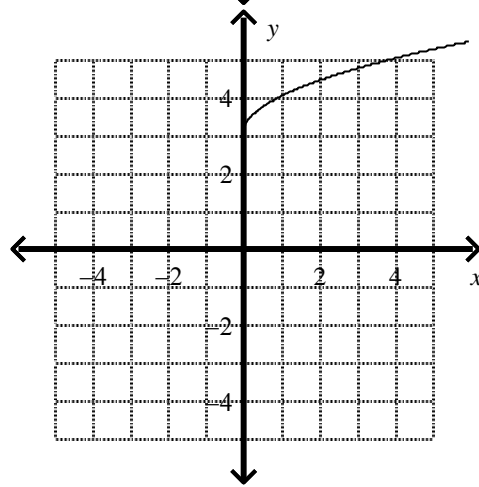
b.



c.

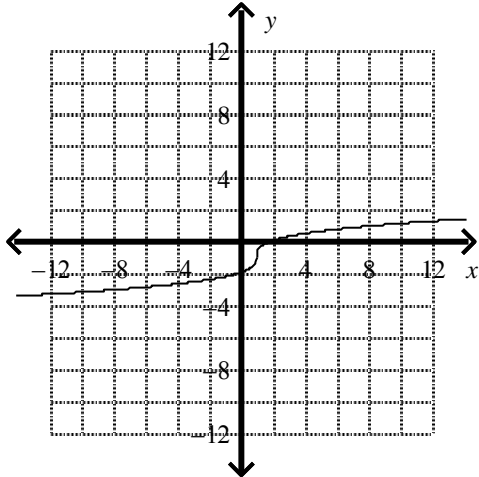


d.

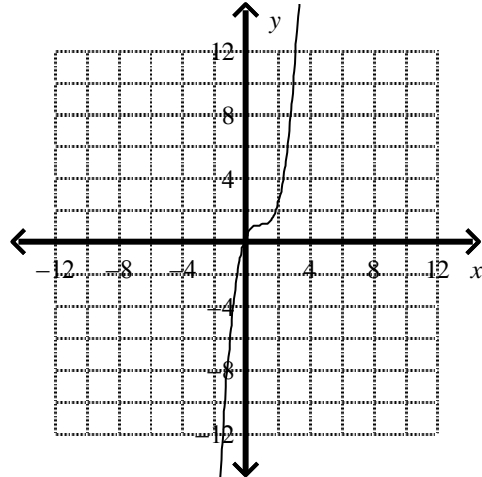


10. $y = \sqrt[3]{x-1} + 1$

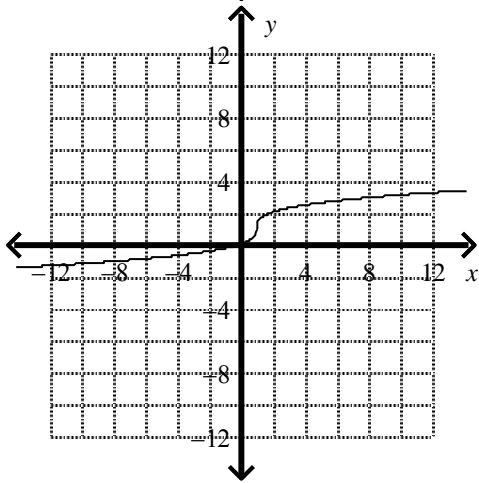
a.



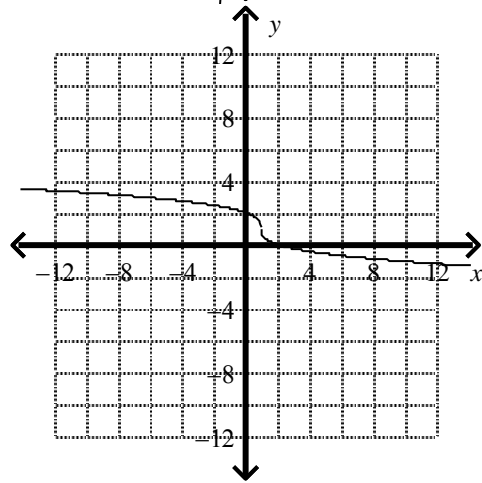
c.



b.



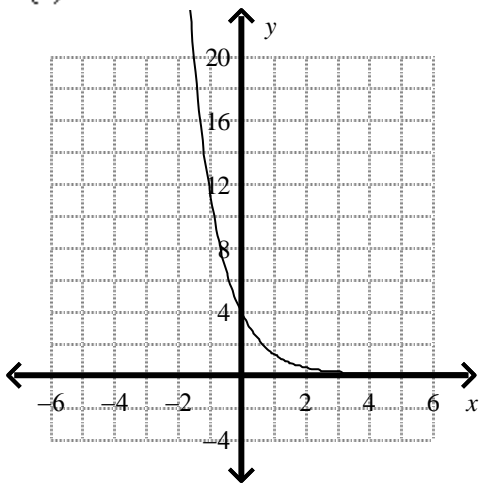
d.



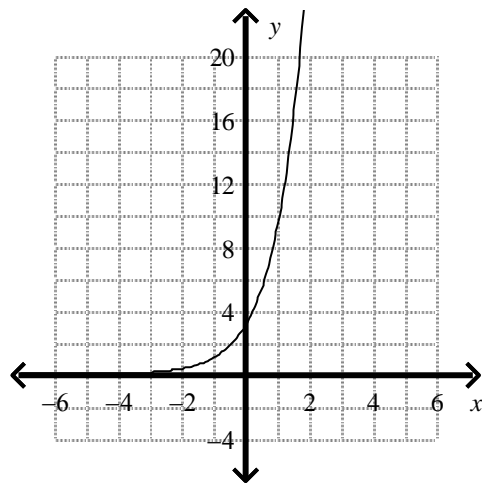
Graph the exponential function.

___ 11. $y = 4(3)^x$

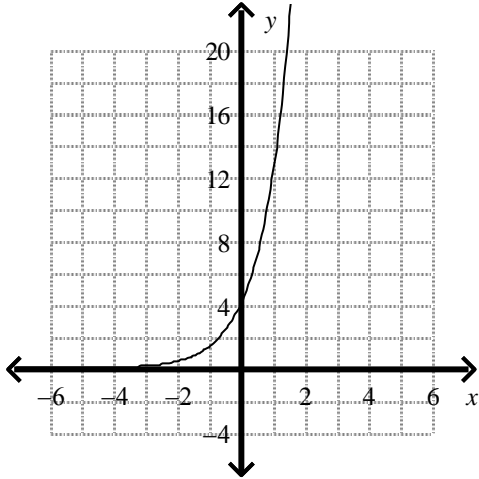
a.



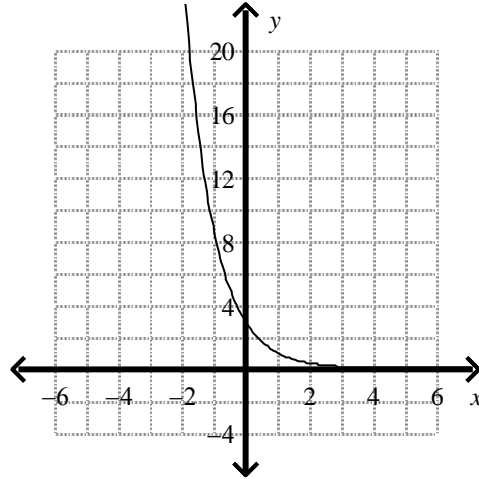
c.



b.



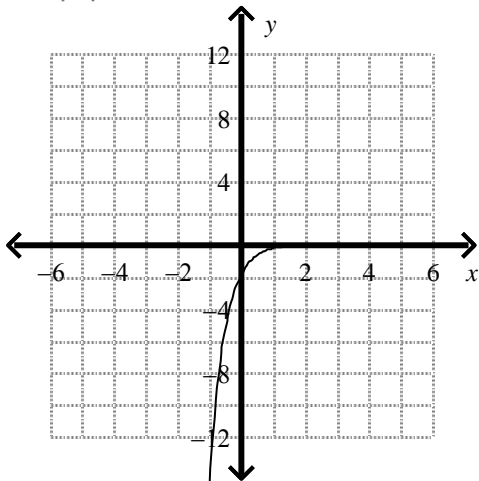
d.



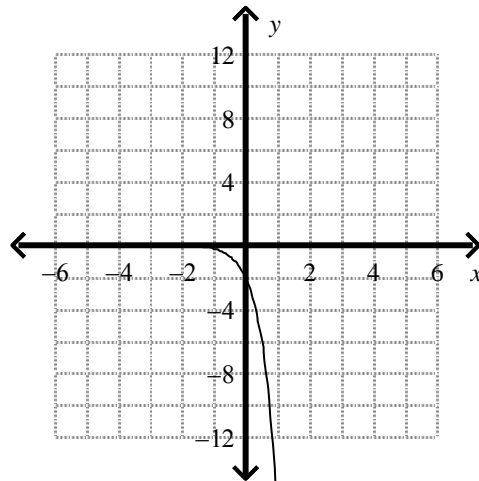
Graph the function.

___ 12. $y = -2\left(\frac{1}{8}\right)^x$

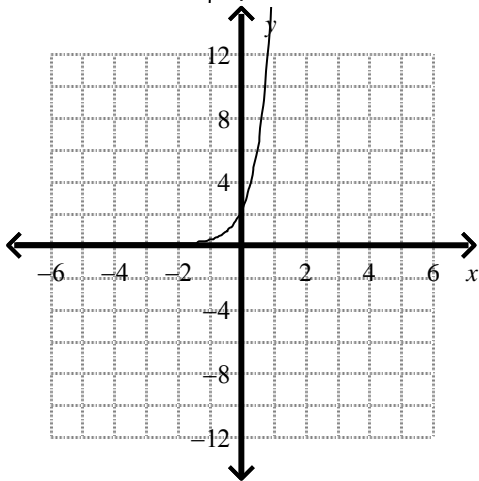
a.



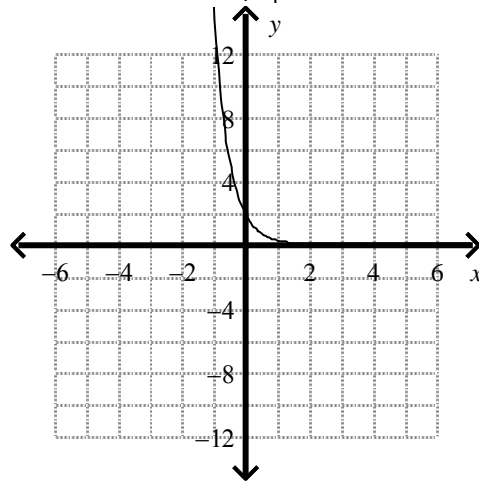
c.



b.



d.



___ 13. Use the graph of $y = e^x$ to evaluate $e^{1.7}$ to four decimal places.

- a. 5.4739 b. 4.6211 c. 2.7183 d. 0.1827

- _____ 14. How much money invested at 5% compounded continuously for 3 years will yield \$820?
 a. \$952.70 b. \$818.84 c. \$780.01 d. \$705.78

Write the equation in exponential form.

_____ 15. $\log_4 \frac{1}{16} = -2$

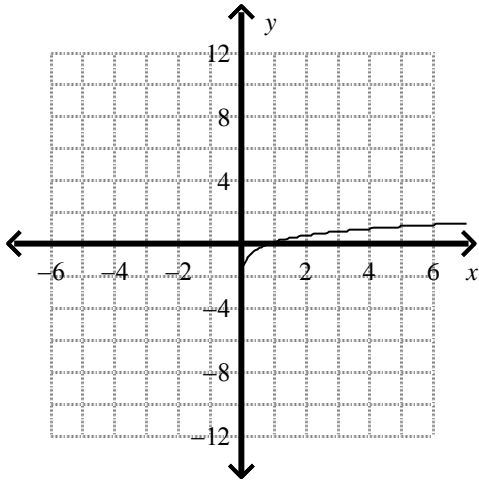
- a. $4^{\frac{1}{2}} = 16$ c. $16^{\frac{1}{2}} = 4$
 b. $4^2 = 16$ d. $4^{-2} = \frac{1}{16}$

Evaluate the logarithm.

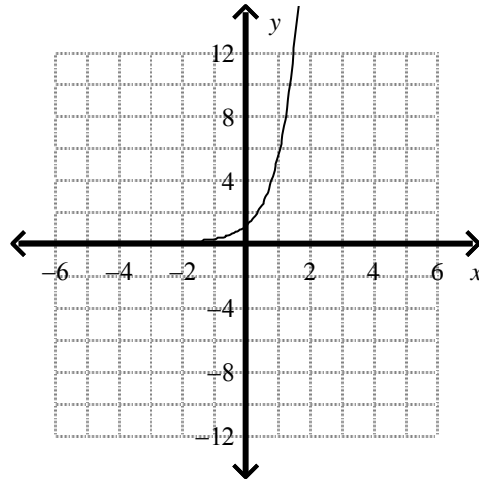
- _____ 16. $\log_3 243$
 a. 5 b. -5 c. 4 d. 3

Graph the logarithmic equation.

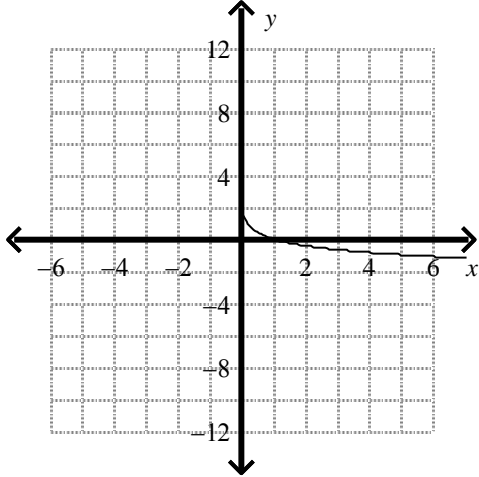
_____ 17. $y = \log_5 x$
 a.



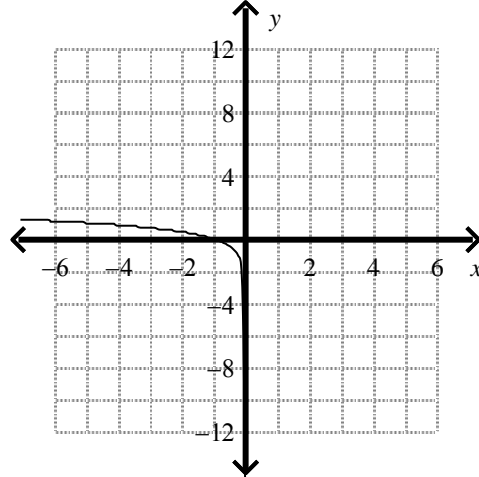
c.



b.



d.



Write the expression as a single logarithm.

18. $\log_7 50 - \log_7 5$
 a. $\log_7 45$ b. $\log_7 45$ c. $\log_7 10$ d. $\log 10$

Expand the logarithmic expression.

19. $\log_3 \frac{d}{12}$
 a. $\log_3 d - \log_3 12$ c. $\frac{\log_3 d}{\log_3 12}$
 b. $-d \log_3 12$ d. $\log_3 12 - \log_3 d$

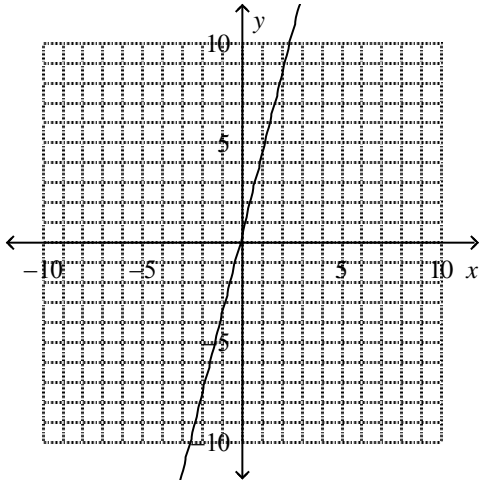
Solve the logarithmic equation. Round to the nearest ten-thousandth if necessary.

20. $\log(x + 9) - \log x = 3$
 a. 0.0090 b. 0.3103 c. 3.2222 d. 111

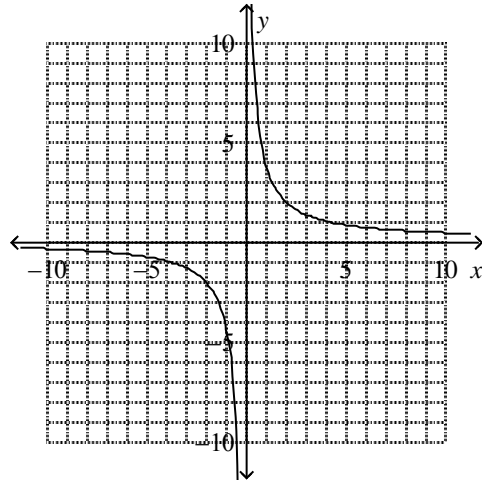
Graph the function.

21. $y = \frac{4}{x}$

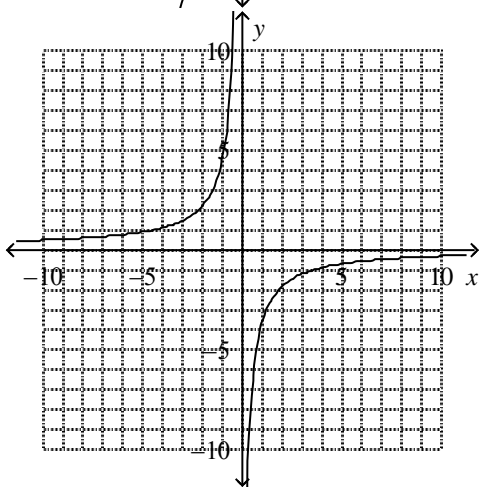
a.



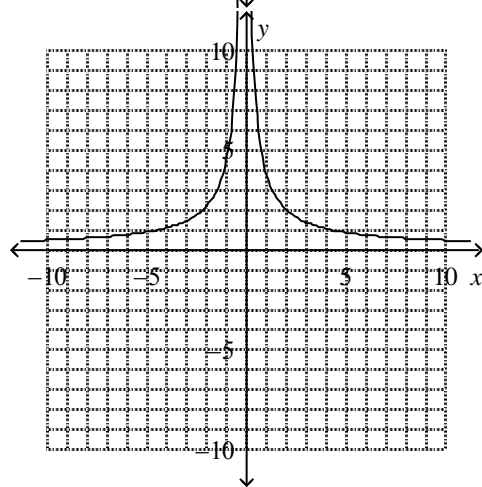
c.



b.



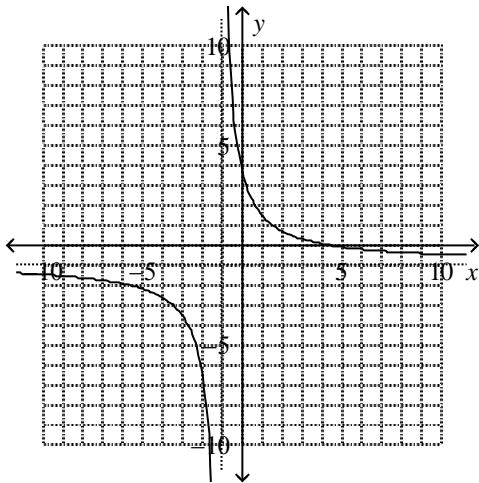
d.



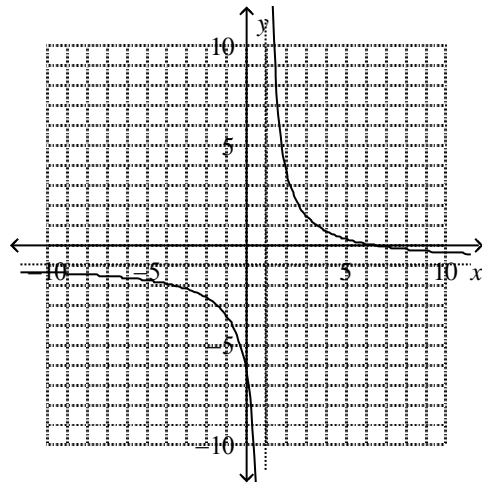
Sketch the asymptotes and graph the function.

22. $y = \frac{5}{x-1} - 1$

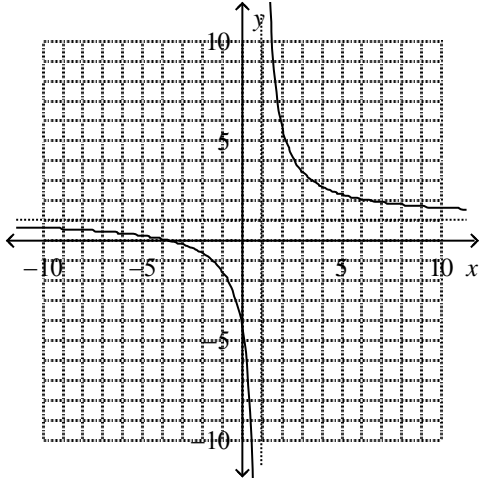
a.



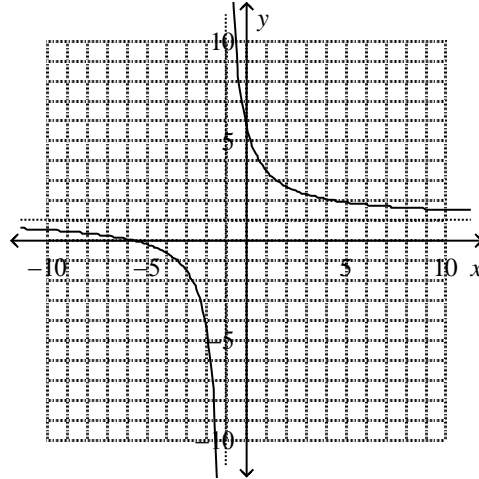
c.



b.



d.



___ 23. Write an equation for the translation of $y = \frac{4}{x}$ that has the asymptotes $x = 7$ and $y = 6$.

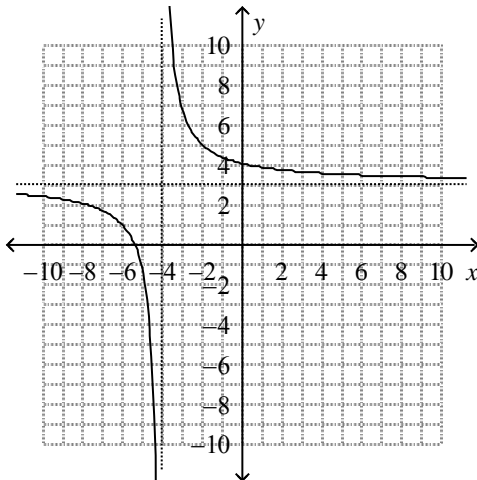
a. $y = \frac{4}{x-6} + 7$

c. $y = \frac{4}{x-7} + 6$

b. $y = \frac{4}{x+7} + 6$

d. $y = \frac{4}{x+6} + 7$

___ 24. This graph of a function is a translation of $y = \frac{4}{x}$. What is an equation for the function?



a. $y = \frac{4}{x+3} + 4$

c. $y = \frac{4}{x+4} - 3$

b. $y = \frac{4}{x+3} - 4$

d. $y = \frac{4}{x+4} + 3$

Find any points of discontinuity for the rational function.

___ 25. What are the points of discontinuity? Are they all removable?

$$y = \frac{(x-7)(x-3)}{x^2 - 10x + 21}$$

- a. $x = 1, x = -8, x = -2$; yes
 b. $x = 7, x = 3$; yes

- c. $x = -7, x = -3$; no
 d. $x = -1, x = 8, x = 2$; no

26. $y = \frac{(x-6)(x+7)(x+9)}{(x-9)(x+8)}$

- a. $x = -9, x = 8$
 b. $x = 9, x = -8$

- c. $x = -6, x = 7, x = 9$
 d. $x = 6, x = -7, x = -9$

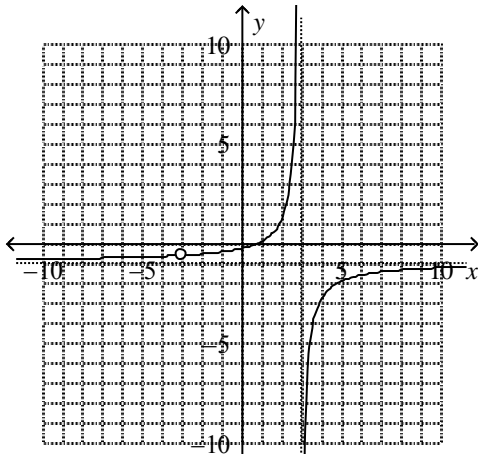
27. Describe the vertical asymptote(s) and hole(s) for the graph of $y = \frac{x-1}{x^2 + 6x + 8}$.

- a. asymptotes: $x = -4, -2$ and hole: $x = 1$
 b. asymptote: $x = 1$ and no holes
 c. asymptote: $x = 1$ and holes: $x = -4, -2$
 d. asymptotes: $x = -4, -2$ and no holes

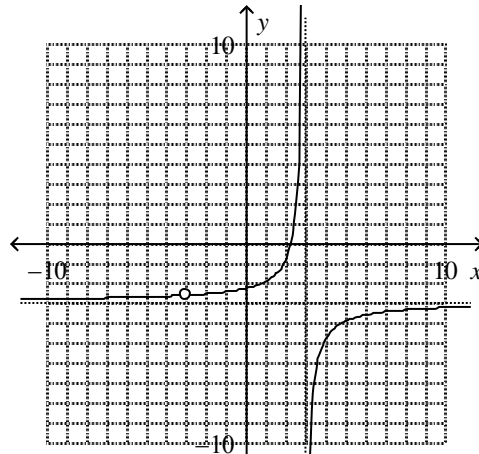
What is the graph of the rational function?

28. $y = \frac{(x-1)(x+3)}{(x+3)(x-3)}$

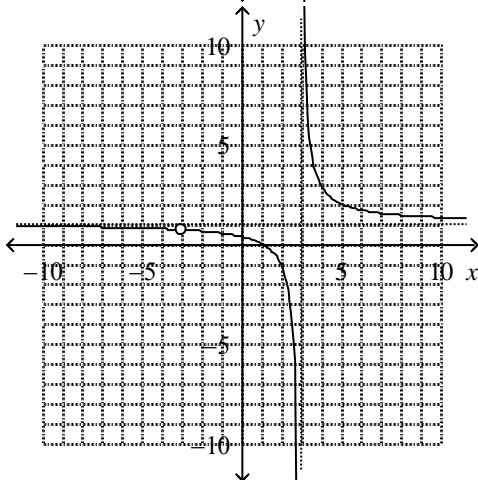
a.



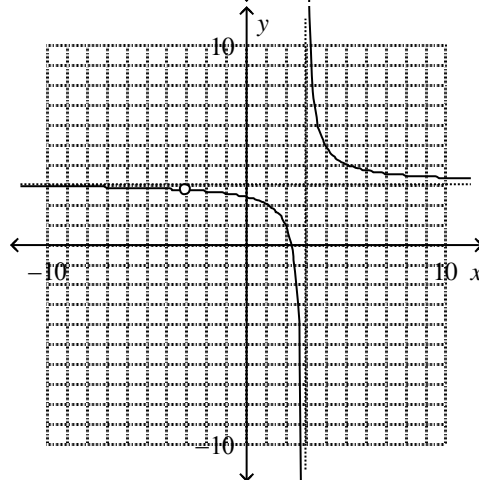
c.



b.



d.



What is the product in simplest form? State any restrictions on the variable.

- _____ 29. $\frac{y^2}{y-3} \cdot \frac{y^2-y-6}{y^2+1y}$
- a. $\frac{y^2+2y}{y+1}, y \neq 3, -1$ c. $\frac{y+2}{y+1}, y \neq 3, 0, -1$
- b. $\frac{y^2+2y}{y+1}, y \neq 3, 0, -1$ d. $\frac{y+2}{y+1}, y \neq 3, -1$

Simplify the sum.

- _____ 30. $\frac{a^2+7a+10}{a^2+2a-15} + \frac{10}{a-3}$
- a. $\frac{a+12}{a-3}$ c. $\frac{a^2+7a+20}{a^2+2a-15}$
- b. $\frac{a+2}{a-3}$ d. $a+12$

Simplify the complex fraction.

- _____ 31. $\frac{\frac{y-1}{y^2+y-6}}{\frac{y-6}{y+3}}$
- a. $\frac{(y-1)(y-6)}{(y+3)^2(y-2)}$ c. $\frac{(y-1)(y-6)}{(y+3)(y-2)}$
- b. $\frac{y-1}{(y-6)(y-2)}$ d. $\frac{(y-1)(y-2)}{(y-6)(y+2)}$

Solve the equation. Check the solution.

- _____ 32. $\frac{6}{x^2-9} - \frac{1}{x-3} = 1$
- a. -4 b. 2 c. $\frac{-1 \pm \sqrt{73}}{2}$ d. 3 or -4

What is an equation of a parabola with the given vertex and focus?

- _____ 33. vertex: $(5, 4)$; focus: $(8, 4)$
- a. $x = \frac{1}{12}(y-4)^2 + 5$ c. $x = \frac{1}{12}(y+4)^2 - 5$
- b. $y = \frac{1}{12}(x+4)^2 - 5$ d. $y = \frac{1}{12}(x-4)^2 + 5$

Write an equation of a circle with the given center and radius.

34. center $(2, -4)$ and radius 5

a. $(x - 2)^2 + (y + 4)^2 = 5$

c. $(x + 2)^2 + (y - 4)^2 = 25$

b. $(x + 2)^2 + (y - 4)^2 = 5$

d. $(x - 2)^2 + (y + 4)^2 = 25$

Write an equation of an ellipse in standard form with the center at the origin and with the given characteristics.

35. vertex at $(-3, 0)$ and co-vertex at $(0, 2)$

a. $\frac{x^2}{9} + \frac{y^2}{4} = 1$

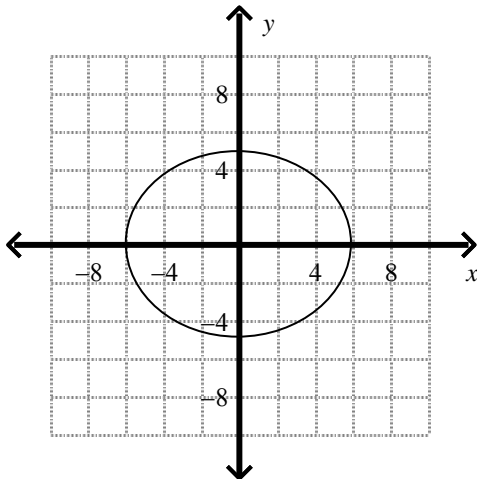
c. $\frac{x^2}{3} + \frac{y^2}{2} = 1$

b. $\frac{x^2}{4} + \frac{y^2}{9} = 1$

d. $\frac{x^2}{2} + \frac{y^2}{3} = 1$

What is the standard-form equation of the ellipse shown?

36.



a. $\frac{x^2}{6} + \frac{y^2}{5} = 1$

c. $\frac{x^2}{6} - \frac{y^2}{5} = 1$

b. $\frac{x^2}{25} - \frac{y^2}{36} = 1$

d. $\frac{x^2}{36} + \frac{y^2}{25} = 1$

37. A yogurt shop offers 6 different flavors of frozen yogurt and 12 different toppings. How many choices are possible for a single serving of frozen yogurt with one topping?

a. 144

b. 72

c. 36

d. 665,280

38. Evaluate ${}_9P_4$.

a. 9

b. 362,880

c. 126

d. 3,024

39. A bag contains 6 red marbles, 6 white marbles, and 4 blue marbles. Find $P(\text{red or blue})$.

a. $\frac{2}{3}$

b. $\frac{3}{2}$

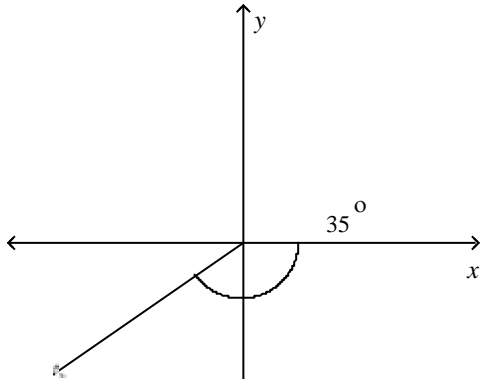
c. $\frac{5}{8}$

d. $\frac{3}{4}$

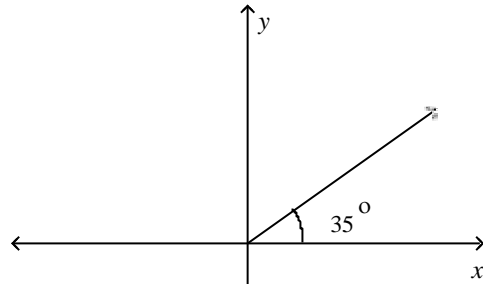
Sketch the angle in standard position.

___ 46. 35°

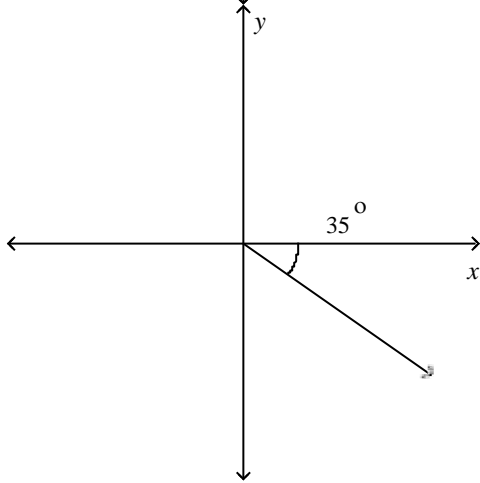
a.



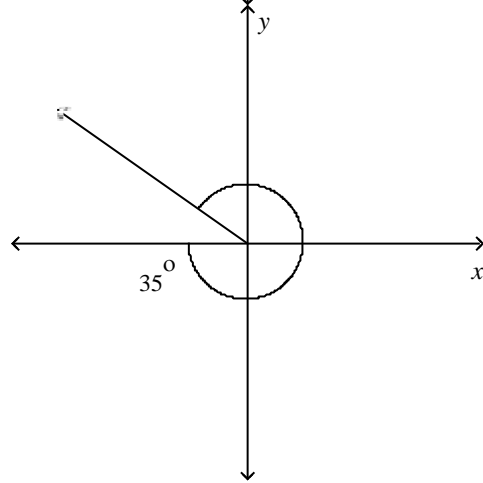
c.



b.



d.



___ 47. Find the measure of an angle between 0° and 360° coterminal with an angle of -271° in standard position.

a. 91°

b. 271°

c. 89°

d. 181°

___ 48. Find the exact value of $\cos 300^\circ$.

a. $\cos = -\frac{1}{2}$

c. $\cos = -\frac{\sqrt{3}}{2}$

b. $\cos = \frac{1}{2}$

d. $\cos = \frac{\sqrt{3}}{2}$

___ 49. Find the exact value of $\cos\left(-\frac{7\pi}{4}\right)$ radians.

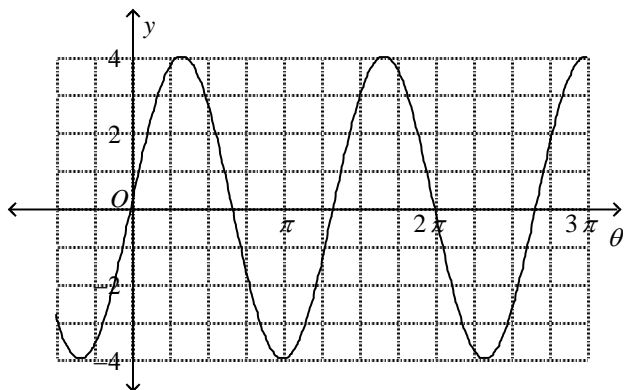
a. $\frac{\sqrt{2}}{2}$

b. $\frac{1}{2}$

c. $\frac{\sqrt{3}}{2}$

d. $-\frac{1}{2}$

___ 50. Find the amplitude of the sine curve shown below.



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

b. 4

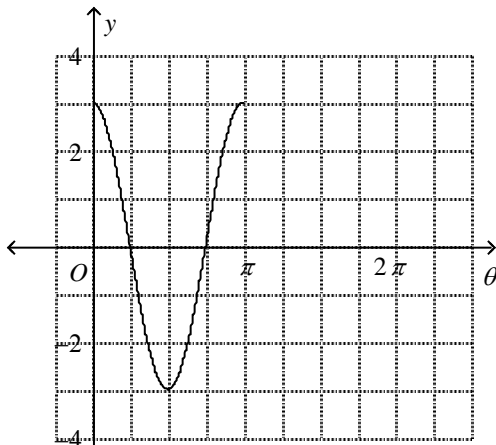
c. 2

d. 8

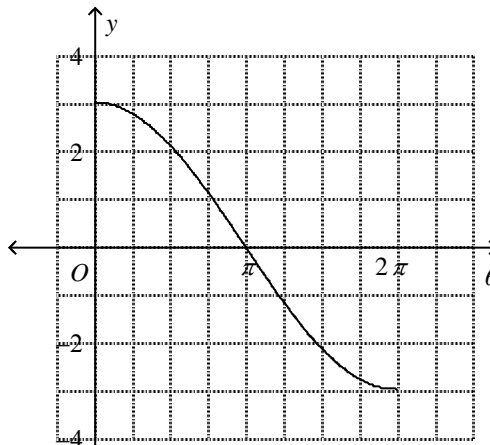
Sketch one cycle of the cosine function.

51. $y = 3 \cos \theta$

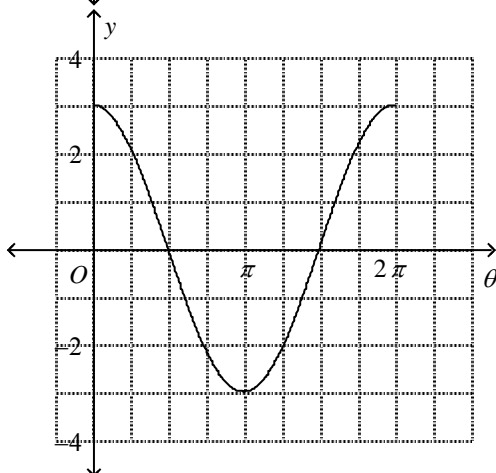
a.



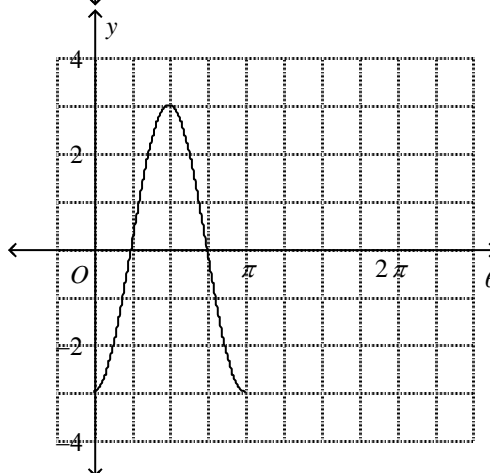
c.



b.



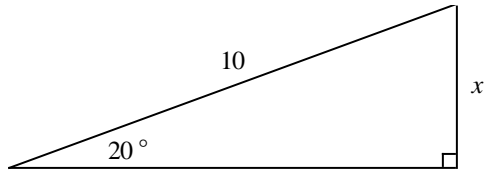
d.



What is the value of the expression? Do not use a calculator.

Find the height of the triangle.

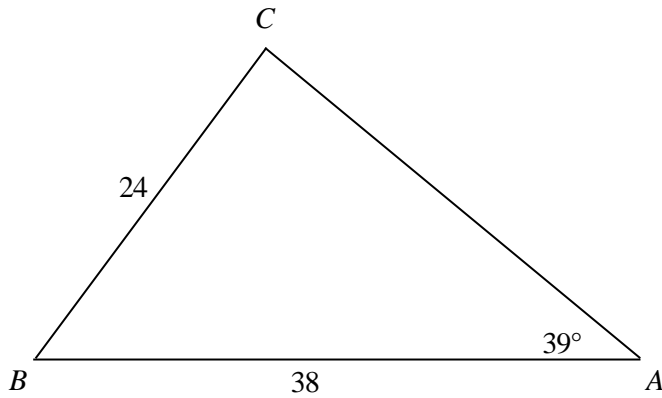
___ 58.



- a. 3.4 b. 9.4 c. 3.6 d. 6.6

Use the Law of Sines to find the missing angle of the triangle.

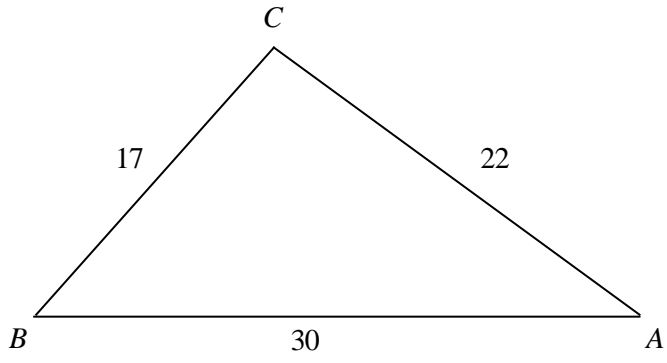
___ 59. Find $m\angle C$ to the nearest tenth.



- a. 156.6° b. 94.8° c. 23.4° d. 85.2°

Use the Law of Cosines to find the missing angle.

___ 60. Find $m\angle A$ to the nearest tenth of a degree.



a. 33.9°

b. 57.7°

c. 46.3°

d. 85.7°

ALGEBRA 2 WITH TRIG SECOND SEMESTER REVIEW

Answer Section

MULTIPLE CHOICE

- | | |
|------------|--|
| 1. ANS: D | REF: 6-5 Solving Square Root and Other Radical Equations |
| 2. ANS: B | REF: 6-5 Solving Square Root and Other Radical Equations |
| 3. ANS: D | REF: 6-6 Function Operations |
| 4. ANS: C | REF: 6-6 Function Operations |
| 5. ANS: D | REF: 6-6 Function Operations |
| 6. ANS: A | REF: 6-6 Function Operations |
| 7. ANS: D | REF: 6-7 Inverse Relations and Functions |
| 8. ANS: D | REF: 6-7 Inverse Relations and Functions |
| 9. ANS: C | REF: 6-8 Graphing Radical Functions |
| 10. ANS: B | REF: 6-8 Graphing Radical Functions |
| 11. ANS: B | REF: 7-1 Exploring Exponential Models |
| 12. ANS: A | REF: 7-2 Properties of Exponential Functions |
| 13. ANS: A | REF: 7-2 Properties of Exponential Functions |
| 14. ANS: D | REF: 7-2 Properties of Exponential Functions |
| 15. ANS: D | REF: 7-3 Logarithmic Functions as Inverses |
| 16. ANS: A | REF: 7-3 Logarithmic Functions as Inverses |
| 17. ANS: A | REF: 7-3 Logarithmic Functions as Inverses |
| 18. ANS: C | REF: 7-4 Properties of Logarithms |
| 19. ANS: A | REF: 7-4 Properties of Logarithms |
| 20. ANS: A | REF: 7-5 Exponential and Logarithmic Equations |
| 21. ANS: C | REF: 8-2 The Reciprocal Function Family |
| 22. ANS: C | REF: 8-2 The Reciprocal Function Family |
| 23. ANS: C | REF: 8-2 The Reciprocal Function Family |
| 24. ANS: D | REF: 8-2 The Reciprocal Function Family |
| 25. ANS: B | REF: 8-3 Rational Functions and Their Graphs |
| 26. ANS: B | REF: 8-3 Rational Functions and Their Graphs |
| 27. ANS: D | REF: 8-3 Rational Functions and Their Graphs |
| 28. ANS: B | REF: 8-3 Rational Functions and Their Graphs |
| 29. ANS: B | REF: 8-4 Rational Expressions |
| 30. ANS: A | REF: 8-5 Adding and Subtracting Rational Expressions |
| 31. ANS: B | REF: 8-5 Adding and Subtracting Rational Expressions |
| 32. ANS: A | REF: 8-6 Solving Rational Equations |
| 33. ANS: A | REF: 10-2 Parabolas |
| 34. ANS: D | REF: 10-3 Circles |
| 35. ANS: A | REF: 10-4 Ellipses |
| 36. ANS: D | REF: 10-4 Ellipses |
| 37. ANS: B | REF: 11-1 Permutations and Combinations |
| 38. ANS: D | REF: 11-1 Permutations and Combinations |
| 39. ANS: C | REF: 11-2 Probability |
| 40. ANS: C | REF: 11-2 Probability |
| 41. ANS: B | REF: 11-6 Analyzing Data |

42. ANS: B REF: 11-6 Analyzing Data
43. ANS: A REF: 11-6 Analyzing Data
44. ANS: B REF: 11-7 Standard Deviation
45. ANS: A REF: 11-8 Samples and Surveys
46. ANS: C REF: 13-2 Angles and the Unit Circle
47. ANS: C REF: 13-2 Angles and the Unit Circle
48. ANS: B REF: 13-2 Angles and the Unit Circle
49. ANS: A REF: 13-3 Radian Measure
50. ANS: B REF: 13-4 The Sine Function
51. ANS: B REF: 13-5 The Cosine Function
52. ANS: C REF: 13-6 The Tangent Function
53. ANS: D REF: 13-7 Translating Sine and Cosine Functions
54. ANS: D REF: 13-8 Reciprocal Trigonometric Functions
55. ANS: A REF: 14-1 Trigonometric Identities
56. ANS: B REF: 14-2 Solving Trigonometric Equations Using Inverses
57. ANS: A REF: 14-3 Right Triangles and Trigonometric Ratios
58. ANS: A REF: 14-3 Right Triangles and Trigonometric Ratios
59. ANS: D REF: 14-4 Area and the Law of Sines
60. ANS: A REF: 14-5 The Law of Cosines