

b. $b = \frac{2.33}{m}$

d. $b = 2.33m$

7. Which equation corresponds to the values in the table below?

Input, x	1	2	3	4	5
Output, y	17	26	35	44	53

a. $y = 8x + 9$

b. $y = 9x + 7$

c. $y = 9x + 8$

d. $y = 10x + 8$

8. For which value of x is the relation *not* a function?

$\{(0, 1), (x, 0), (3, 5), (2, 6)\}$

a. 1

b. 3

c. 4

d. 6

9. Find the slope of the line passing through the points $A(-1, 1)$ and $B(4, -5)$.

a. $\frac{6}{-5}$

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

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

d. $\frac{5}{-6}$

10. Find the slope of the line that contains $(-8, 2)$ and $(7, -4)$.

a. $\frac{2}{-5}$

b. $\frac{5}{-2}$

c. 0

d. undefined

11. What is the y -intercept of the line with the equation $4x + 9y = -108$?

a. -12

b. 12

c. -27

d. 27

12. State the x - and y -intercepts of the line with the equation $y = -2x + 4$.

a. x -intercept: 4; y -intercept: 2

b. x -intercept: 2; y -intercept: 4

c. x -intercept: -4; y -intercept: -2

d. x -intercept: -2; y -intercept: -4

13. Find the slope and y -intercept of the line with the equation $-9x + 3y = 54$.

a. $m = 3, b = 18$

c. $m = -3, b = -18$

b. $m = 18, b = 3$

d. $m = -18, b = -3$

Consider lines whose equations have the form $y = mx + 20$. Find the difference of the x -intercepts of lines l_1 and l_2 if their slopes are m_1 and m_2 , respectively.

14. Which statement is always a correct conclusion about the values of x and y in the function $y = x - 3$?

a. The value of x is always 3 less than the value of y .

b. The value of y is always less than the value of x .

c. When the value of x is positive, the value of y is also positive.

d. As the value of x increases, the value of y decreases.

15. Write the polynomial so that the exponents decrease from left to right.

$6x^3 - 6x + 4x^5 - 2$

a. $4x^5 + 6x^3 - 6x - 2$

c. $-4x^5 - 6x^3 + 6x + 2$

b. $-2 + 4x^5 - 6x + 6x^3$

d. $2 - 4x^5 + 6x - 6x^3$

16. Find the degree of the polynomial $-3x^4 + 2x^3 + 7$.

a. 4

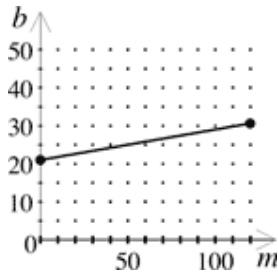
c. 6

b. 1

d. 7

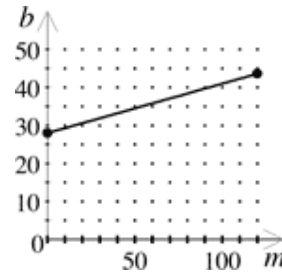
17. A monthly phone bill, $b(m)$, consists of a \$28 service fee plus \$0.13 per minute, m , of long distance calls, given by the function $b(m) = 28 + 0.13m$. Draw a graph for up to and including 120 minutes of long distance calls made in a month. Estimate the bill if 84 minutes of long distance calls are made.

a. a.



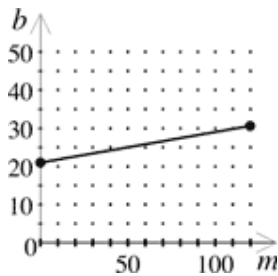
b. \$20

c. a.



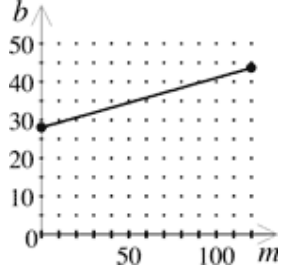
b. \$39

b. a.



b. \$29

d. a.



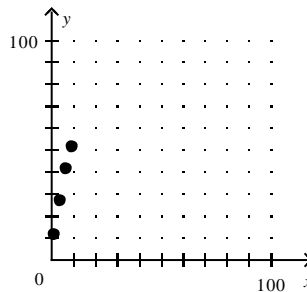
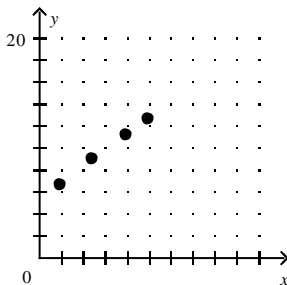
b. \$45

18. Classify the expression $-9v^9 - 7$ and state its degree.

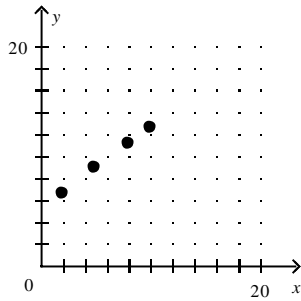
- a. binomial, 9
 b. binomial, 10
 c. trinomial, 9
 d. trinomial, 10

19. Employees earn \$5 per hour plus \$0.75 for every unit they produce per hour. Which of the following shows both an equation in which y represents the employee's wages for producing x units per hour, and the graph of the wages earned for producing 2, 5, 8, and 10 units per hour?

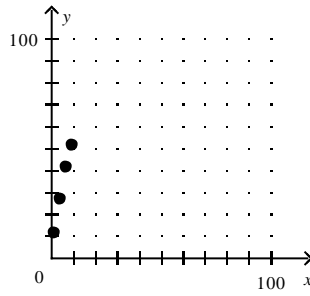
- a. $y = 5 + 0.75x$
 c. $y = 5x + 0.75$



b. $y = 5x + 0.75$



d. $y = 5 + 0.75x$



Find the sum.

20. $(2a^7 + 3a^3 - 6) + (-2a^3 + 4 + 6a^7)$

a. $8a^7 + a^3 - 2$

b. $a^7 + 8a^3 - 2$

c. $a^7 + 8a^3 + 2$

d. $8a^7 + a^3 + 2$

Simplify the expression.

21. $(5q^5 + 4) - (2q^3 + 9) + (6q^5 - q^3)$

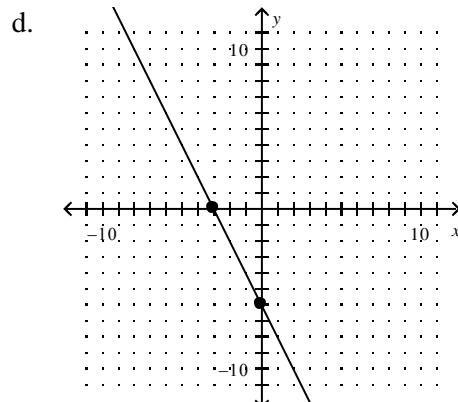
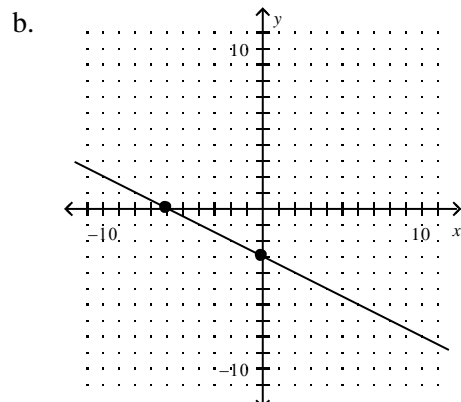
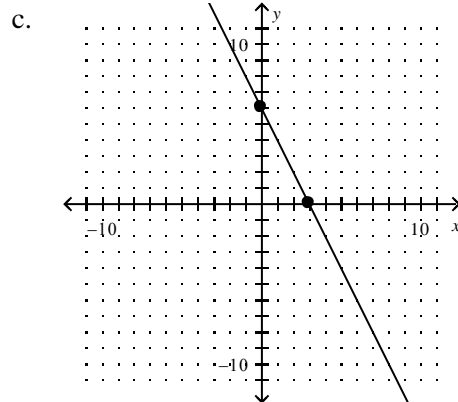
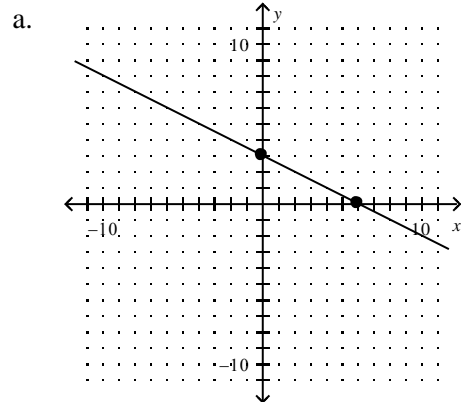
a. $11q^5 - 3q^3 - 5$

b. $-3q^5 + 11q^3 - 5$

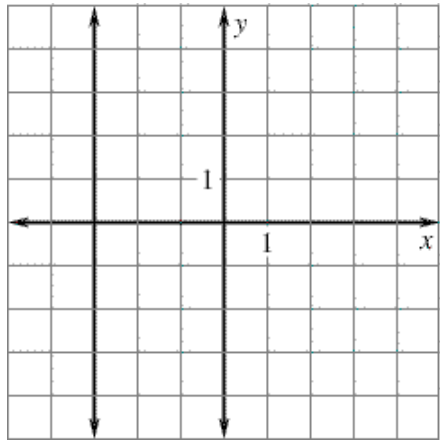
c. $11q^3 + 3q^5 + 5$

d. $11q^5 + 3q^3 + 5$

22. Graph the linear equation $3x + 6y = 18$ by finding the x - and y -intercepts.



23. Determine the slope of the line graphed below.



- a. 0 b. -3 c. $-\frac{1}{3}$ d. undefined

Find the difference.

24. $(6b^3 + 3b^2 + 8) - (2b^3 - 8b^2 + 6b - 5)$

- a. $4b^3 + 11b^2 - 6b + 13$ c. $11b^3 - 4b^2 - 6b + 3$
 b. $4b^3 + 11b^2 + 6b - 13$ d. $11b^3 + 4b^2 - 6b - 3$

25. $(-4z^4 - 4z^3 - 6) - (-6z^4 - 7z^3 - 3)$

- a. $2z^4 + 3z^3 - 3$ c. $10z^4 + 11z^3 + 9$
 b. $-10z^4 - 11z^3 - 9$ d. $-2z^4 - 3z^3 + 3$

26. A rectangle has a length of $x + 5$ and a width of $x - 7$. Write an equation that describes the area, A , of the rectangle in terms of x .

- a. $A = x^2 - 2x - 35$ c. $A = 2x - 2$
 b. $A = x^2 + 12x - 35$ d. $A = 2x + 12$

Find the product.

27. $(x + 5)(x + 2)$

- a. $x^2 + 7x + 10$ c. $x^2 - 7x + 10$
 b. $x^2 - 7x - 10$ d. $x^2 + 7x - 10$

28. $(4x + 1)(4x - 3)$

- a. $16x^2 + 8x - 3$ c. $16x^2 - 8x - 3$
 b. $16x^2 - 8x + 3$ d. $16x^2 - 16x - 3$

29. $(x + 4)(x + 7)$

- a. $x^2 + 28$ c. $x^2 + 11x + 28$
 b. $x^2 + 28x + 11$ d. $x^2 + 28x + 28$

30. $(x + 5)(x^2 - 2x + 3)$

- a. $x^3 + 3x^2 - 7x + 15$ c. $x^3 + 3x^2 - 10x + 15$
 b. $x^3 - 2x^2 + 15$ d. $x^2 - 3x + 15$

31. $(x + 7)(x^2 - 4x + 2)$

- a. $x^3 + 3x^2 - 26x + 14$
- b. $x^3 + 11x^2 - 26x + 14$

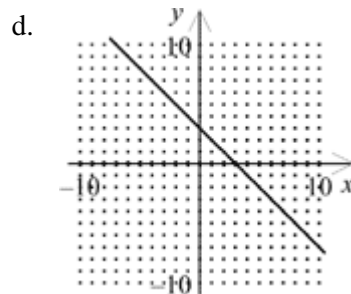
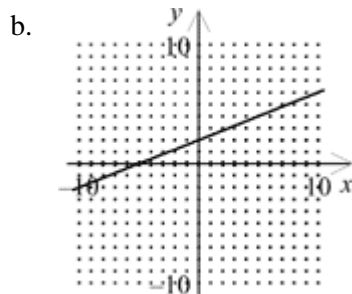
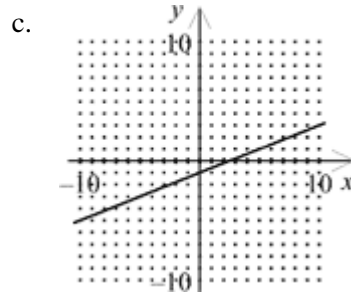
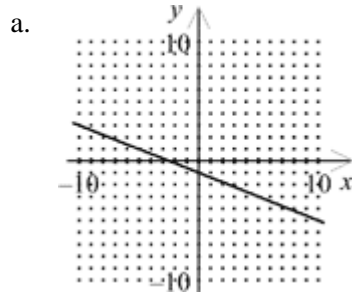
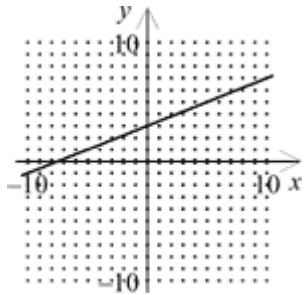
- c. $x^3 + 3x^2 - 30x + 14$
- d. $x^3 + 11x^2 - 30x + 14$

32. $(6y^2 + 3y + 2)(y - 7)$

- a. $6y^3 - 39y^2 - 19y - 14$
- b. $6y^3 - 45y^2 - 19y + 14$

- c. $6y^3 - 39y^2 - 21y - 14$
- d. $6y^3 - 45y^2 - 21y + 14$

33. The equation $y = \frac{2}{5}x + 3$ is graphed below. Which graph shows the result of changing the 3 in the equation to -1 ?



34. Write a variable expression for the area of the rectangle.



- a. $(x - 1)(x - 3)$
- b. $3(x + 1)$

- c. $(x + 3)(x + 1)$
- d. $(x)(3x)$

35. A rectangular garden, with length four times its width, is to be expanded so that both sides are increased by 3 yards.

Let x represent the original width of the garden. Write an expression that models the area of the expanded garden.

- a. $5x + 6$
b. $4x^2 + 6x + 9$
c. $4x^2 + 9$
d. $4x^2 + 15x + 9$

Find the product.

36. $(5x^2 - 5)^2$
a. $25x^4 - 25$
b. $25x^2 - 10x + 25$
c. $25x^4 - 50x^2 + 25$
d. $25x^4 - 50x^2 - 25$
37. $(5c + 6)(5c - 6)$
a. $25c^2 - 36$
b. $25c^2 + 36$
c. $25c^2 + 60c - 36$
d. $25c^2 + 60c + 36$
38. $(2v + 5)(2v - 5)$
a. $4v^2 - 25$
b. $4v^2 + 25$
c. $4v^2 + 20v - 25$
d. $4v^2 + 20v + 25$

Find the missing term.

39. $(x + 9)^2 = x^2 + 18x + \underline{\quad}$
a. 81
b. 27
c. 72
d. 90

Factor the polynomial.

40. $x^2 + 6x + 5$
a. $(x + 1)(x - 5)$
b. $(x - 1)(x - 5)$
c. $(x + 1)(x + 5)$
d. $(x - 1)(x + 5)$
41. The volume of a cylinder is given by the formula $V = \pi r^2 h$, where r is the radius of the base of the cylinder and h is the height of the cylinder. If the radius of the cylinder is increased by 1 unit and the height remains the same, the ratio for the volume of the new cylinder to the volume of the original cylinder is 4:1. Find the length of the radius of the original cylinder.
a. 2 units
b. 1 unit
c. 3 units
d. 4 units

Solve the equation.

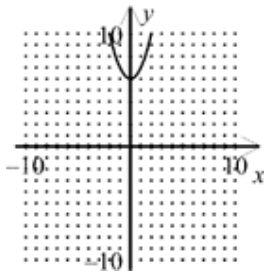
42. $16g^2 + 40g + 25 = 0$
a. $g = -\frac{4}{5}$
b. $g = \frac{4}{5}$
c. $g = -\frac{5}{4}$
d. $g = \frac{5}{4}$

Solve the equation.

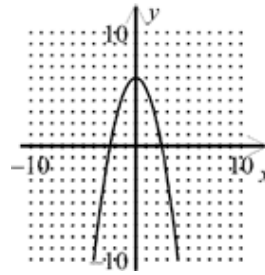
43. $x^3 + 4x^2 - 25x - 100 = 0$
a. -4, 25
b. -5, 4, 5
c. 4, 5
d. -4, -5, 5

44. Graph $y = x^2 + 6$

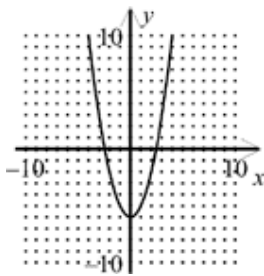
a.



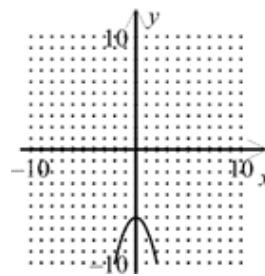
c.



b.



d.



Solve the equation.

45. $25x^2 - 9 = 0$

a. $-\frac{5}{3}, \frac{5}{3}$

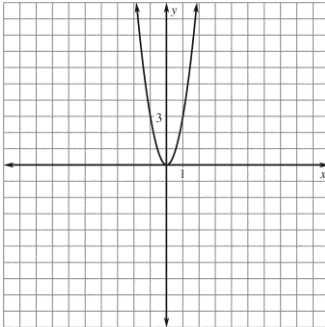
b. $-\frac{3}{5}, \frac{3}{5}$

c. $-\frac{9}{25}, \frac{9}{25}$

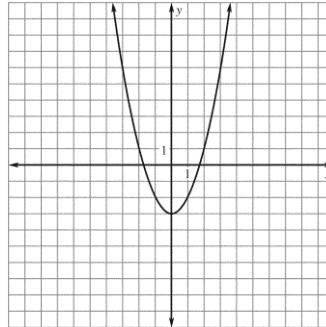
d. $-\frac{25}{9}, \frac{25}{9}$

46. Sketch the graph of the equation $y = -3x^2$.

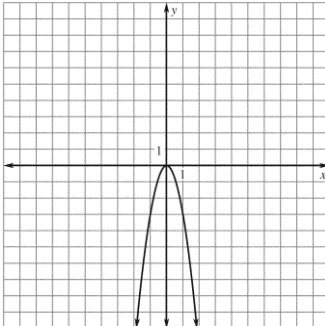
a.



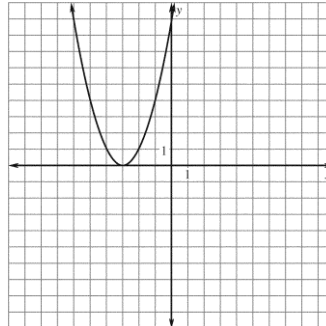
c.



b.



d.



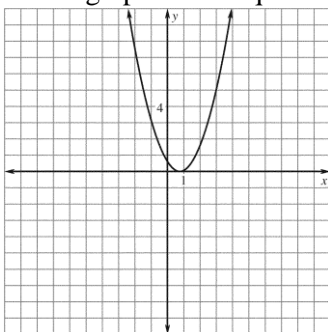
47. How would you translate the graph of $y = -x^2$ to produce the graph of $y = -x^2 - 4$?

- a. translate the graph of $y = -x^2$ down 4 units
- b. translate the graph of $y = -x^2$ up 4 units
- c. translate the graph of $y = -x^2$ left 4 units
- d. translate the graph of $y = -x^2$ right 4 units

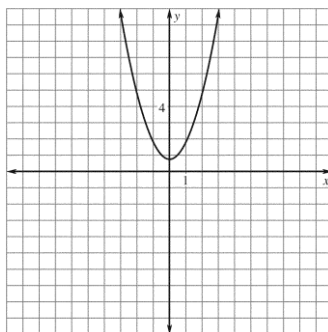
48. Predict how the graph of the equation $y=7x^2$ will compare with the graph of the equation $y = x^2$.
- The graph of $y=7x^2$ will open down because coefficient is positive. The graph will be narrower because 7 is greater than 1.
 - The graph of $y=7x^2$ will open up because the coefficient is positive. The graph will be narrower because 7 is greater than 1.
 - The graph of $y=7x^2$ will open down because coefficient is positive. The graph will be wider because 7 is greater than 1.
 - The graph of $y=7x^2$ will open up because the coefficient is positive. The graph will be wider because 7 is greater than 1.

49. Sketch the graph of the equation $y=0.75x^2$.

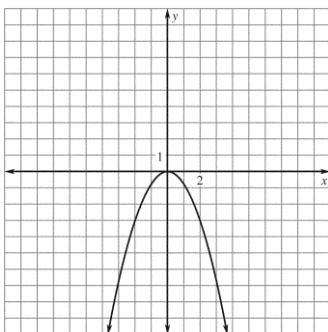
a.



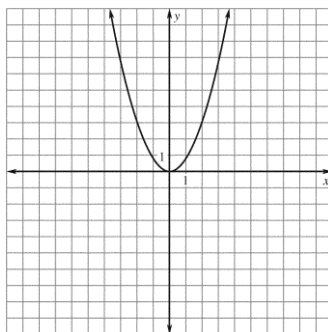
c.



b.

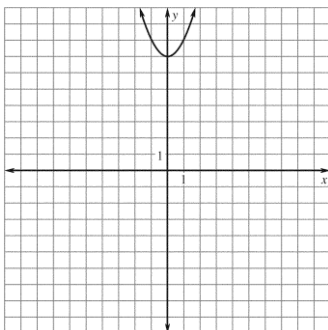


d.

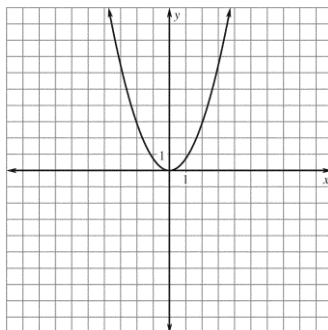


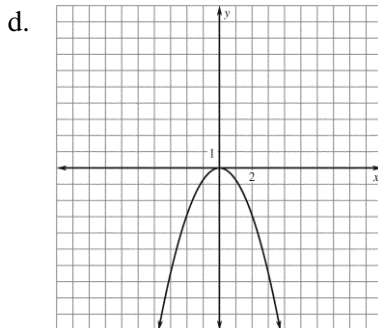
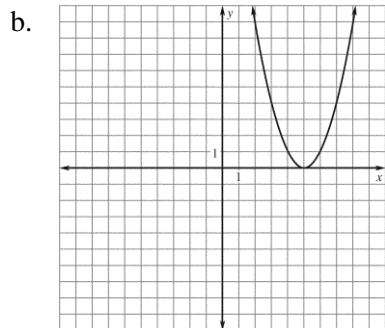
50. Sketch the graph of the equation $y=-\frac{5}{7}x^2$.

a.



c.

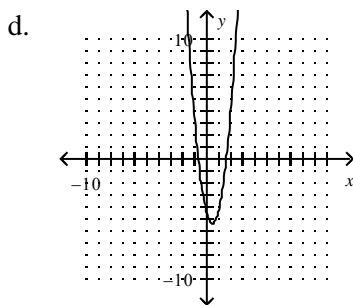
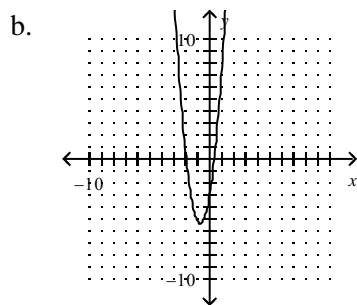
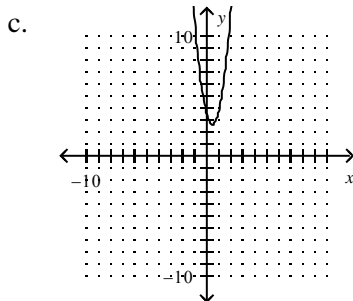
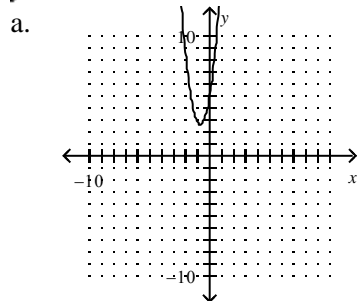




51. How would you change the graph of $y = x^2$ to produce the graph of $y = x^2 - 5$?
- shift the graph of $y = x^2$ right 5 units
 - shift the graph of $y = x^2$ down 5 units
 - shift the graph of $y = x^2$ up 5 units
 - shift the graph of $y = x^2$ left 5 units

Graph:

52. $y = 4x^2 + 5x + 4$



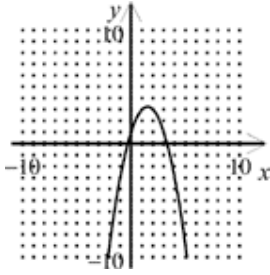
53. When does the equation $x^2 = d$ have no solutions?
- always
 - when $d < 0$
 - never
 - when $d > 0$

Simplify:

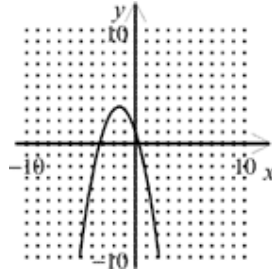
54. $\sqrt{300}$
- $10\sqrt{30}$
 - $10\sqrt{3}$
 - $\sqrt{30}$
 - $3\sqrt{10}$
55. $\sqrt{200}$
- $10\sqrt{2}$
 - $5\sqrt{2}$
 - $50\sqrt{2}$
 - $20\sqrt{2}$

56. Graph the parabola: $y = -x^2 + 3x - 1$

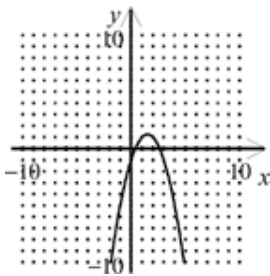
a.



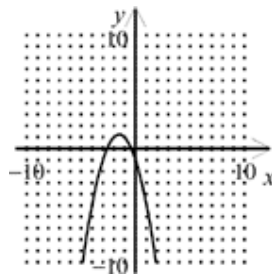
c.



b.



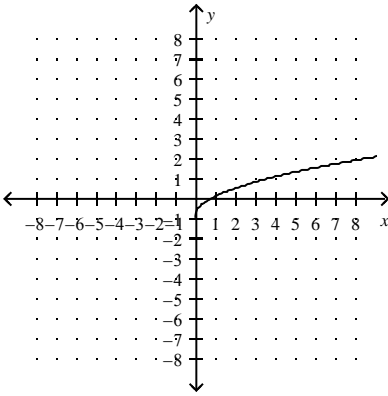
d.



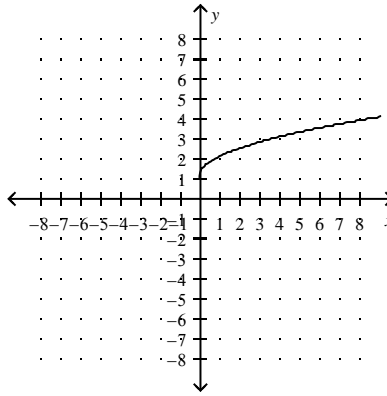
Graph:

57. $f(x) = \sqrt{x} - 1$

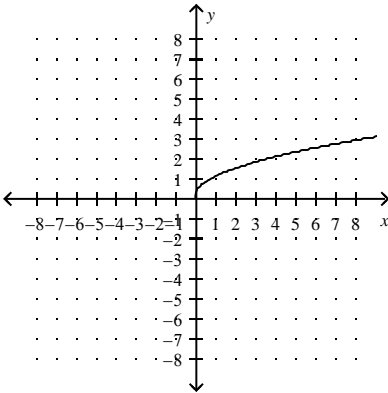
a.



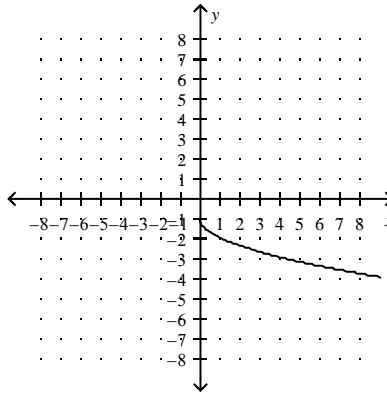
c.



b.

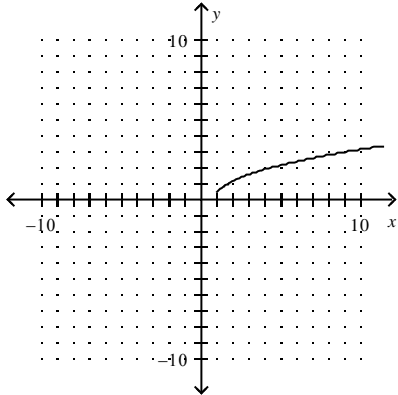


d.



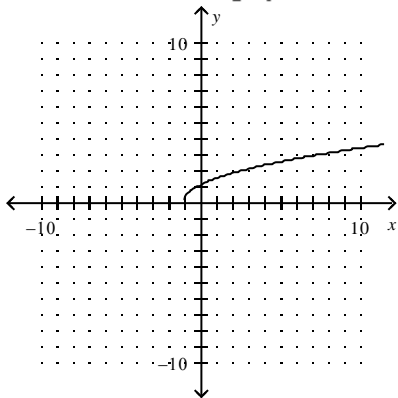
58. Graph the radical function $y = \sqrt{x-1}$ and then find the domain and range.

a.



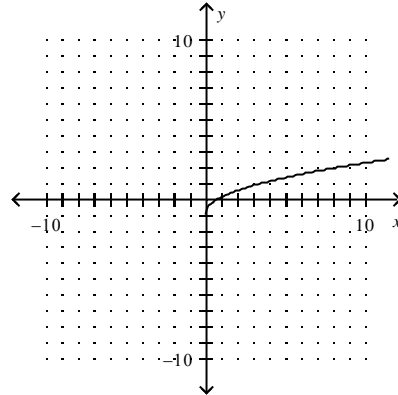
Domain: $x \geq 1$; Range: $y \geq 0$

b.



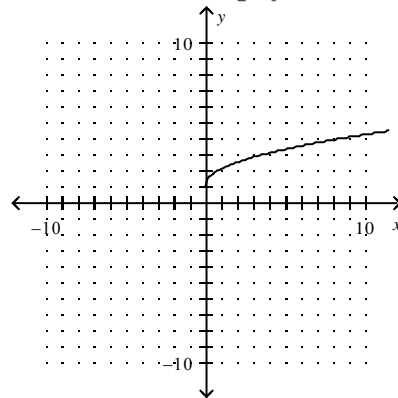
Domain: $x \geq -1$; Range: $y \geq 0$

c.



Domain: $x \geq 0$; Range: $y \geq -1$

d.



Domain: $x \geq 0$; Range: $y \geq 1$

Simplify:

59. $\sqrt{\frac{49}{100}}$

a. $\frac{7}{50}$

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

c. $\frac{7}{100}$

d. $\frac{7}{10}$

60. What is the simplified form of $2\sqrt{7} - (-8\sqrt{7}) - 3\sqrt{7}$?

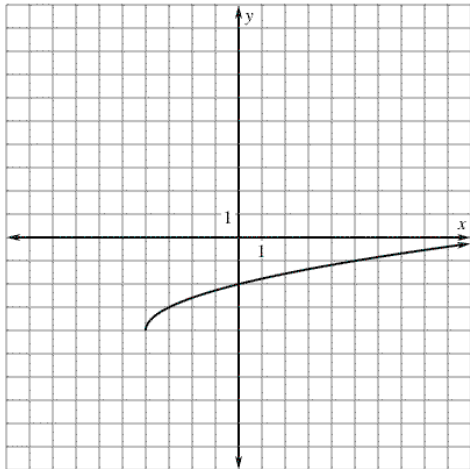
a. $13\sqrt{7}$

b. 49

c. $7\sqrt{7}$

d. $\sqrt{49}$

61. Which function matches the graph?



a. $f(x) = \sqrt{x+4} + 4$

b. $f(x) = \sqrt{x-4} + 4$

c. $f(x) = \sqrt{x-4} - 4$

d. $f(x) = \sqrt{x+4} - 4$

Simplify:

62. $\sqrt{10} \cdot \sqrt{4}$

a. $2\sqrt{10}$

b. $4\sqrt{5}$

c. $2\sqrt{5}$

d. $\sqrt{40}$

63. $\sqrt{30} \cdot \sqrt{12}$

a. $9\sqrt{20}$

b. $12\sqrt{10}$

c. $6\sqrt{10}$

d. $3\sqrt{40}$

64. $11\sqrt{25}$

a. 137.5

b. 16

c. 55

d. 27.5

Simplify:

65. $7\sqrt{6} + 8\sqrt{6} - 3\sqrt{6}$

a. $\sqrt{72}$

b. $12\sqrt{6}$

c. 72

d. $18\sqrt{6}$

66. $\sqrt{32} + \sqrt{72}$

a. $2\sqrt{10}$

b. $46\sqrt{2}$

c. $\sqrt{104}$

d. $10\sqrt{2}$

67. $2\sqrt{6} - \sqrt{81} - 4\sqrt{24}$

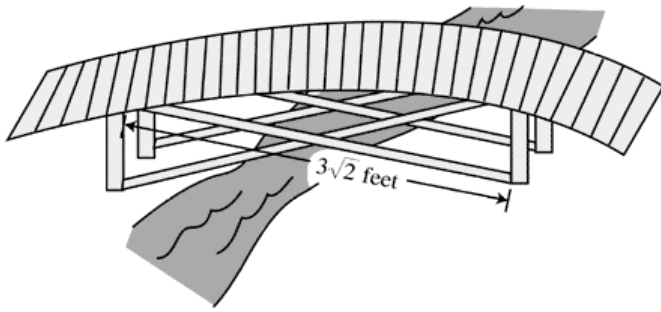
a. $-6\sqrt{6} - 9$

b. $-11\sqrt{6} - 9 - 4\sqrt{24}$

c. $-5\sqrt{24}$

d. $-15\sqrt{6}$

68. A bridge over a stream in a garden is to be braced as shown in the figure below. The contractor determines that each of the identical braces must be $3\sqrt{2}$ feet long.



What is the approximate total length of all 4 braces?

- a. 8.5 feet b. 17.0 feet c. 24.0 feet d. 9.8 feet
69. Simplify the expression $\sqrt{500}$.
- a. $50\sqrt{10}$ b. $10\sqrt{5}$ c. $5\sqrt{10}$ d. $10\sqrt{50}$

Solve:

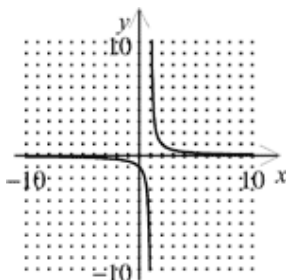
70. $\sqrt{x+3} = -6$
- a. 33 c. no real number solutions
b. 33, -39 d. -39

Solve:

71. $\sqrt{x+9} - 9 = 2$
- a. 112 b. no solution c. -68 d. -16
72. $\sqrt{6x+4} = 25$
- a. $\frac{207}{2}$ c. $\frac{207}{2}, \frac{209}{2}$
b. 1 d. $\frac{599}{6}$
6 6
73. $\sqrt{x+72} = x$
- a. 9 b. no solution c. 9, -8 d. -8

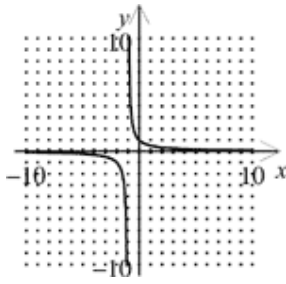
74. Graph the rational function $f(x) = \frac{1}{x-1}$. Then find its domain and range.

a.



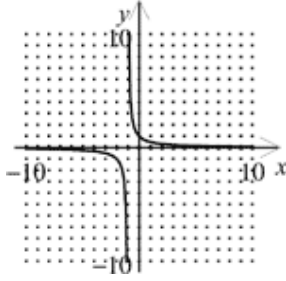
Domain: all real numbers except 1
Range: all real numbers except 0

b.



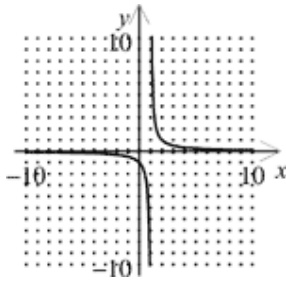
Domain: all real numbers except -1
 Range: all real numbers except 0

c.



Domain: all real numbers except -1
 Range: all real numbers except 1

d.



Domain: all real numbers except 1
 Range: all real numbers except 0

Divide:

75. $\frac{x^2 + 5x + 3}{x}$

a. $x + 5 + \frac{3}{x}$

b. $x + 5$

c. $x^2 + 5 + \frac{3}{x}$

d. $x + 3$

76. $(k^3 + 8) \div (k + 2)$

a. $k^2 - 2k + 4$

b. $k^2 - 4$

c. $k^2 + 8k + 4$

d. $k^2 + 4$

77. $\frac{b^2 - 3b + 3}{b - 5}$

a. $2b - 2 + \frac{7}{b - 5}$

b. $b + 2 + \frac{13}{b - 5}$

c. $b - 8 + \frac{49}{b - 5}$

d. $b + 2 + \frac{-13}{b - 5}$

78. $\frac{d^2 + 5d - 5}{d + 3}$

- a. $d + 2$, remainder -11
 b. $d + 2$, remainder 11

- c. $d + 8$, remainder 49
 d. $2d - 2$, remainder -1

79. Divide $-2x^3 - 4x - 3$ by $x - 2$.

- a. $-2x^2 - 4x - 12 - \frac{27}{x - 2}$
 b. $-2x^2 - 4x - 13 - \frac{25}{x - 2}$

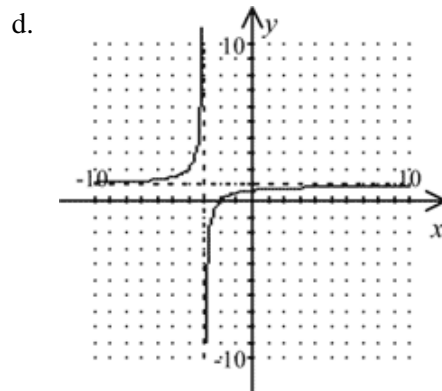
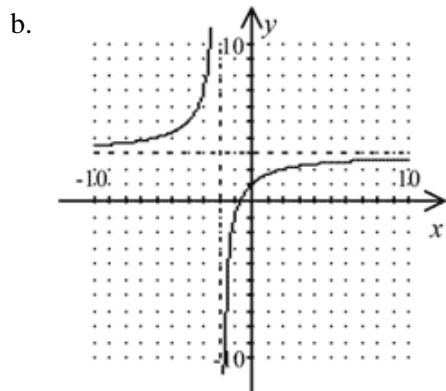
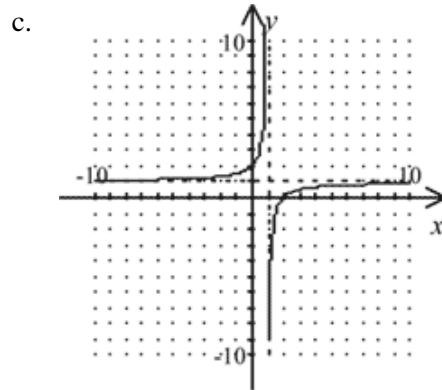
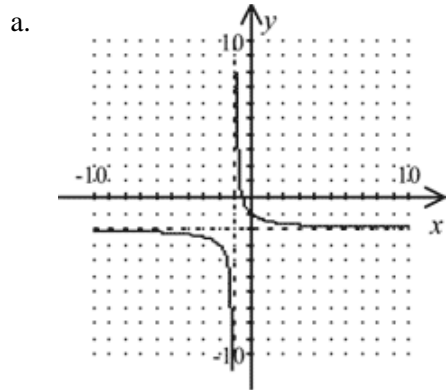
- c. $-2x^2 - 4x - 13 - \frac{12}{x - 2}$
 d. $-2x^2 - 4x - 12 + \frac{27}{x - 2}$

80. Divide $24x^2 - 9x^3 + 12 - 27x$ by $3x - 5$.

- a. $-3x^2 + 3x - 4 - \frac{8}{3x - 5}$
 b. $-3x^2 + 3x - 9 - \frac{2}{x - 5}$

- c. $-3x^2 + 3x - 9 - \frac{16}{x - 5}$
 d. $-3x^2 + 3x - 4 + \frac{8}{x - 5}$

81. Graph $f(x) = \frac{x - 2}{x - 1}$.



Simplify:

82. $\frac{-3x + 3x^2}{-24x + 24}$

- a. $-\frac{x}{8}$
 b. $\frac{x - x^2}{8x - 8}$
 c. $\frac{x^2}{16}$
 d. $\frac{1 - x}{16}$

Find the product.

83. $\frac{4y^2}{3} \cdot \frac{9}{12y}$

- a. y
b. $\frac{2}{9}y^2$

- c. $12y$
d. $\frac{1}{4}$

84. $(x-2) \cdot \frac{x+4}{x^2-4}$

- a. $\frac{x+4}{x+2}$
b. $\frac{x+4}{(x-2)(x^2-4)}$

- c. $\frac{x+4}{x-2}$
d. 2

Find the quotient.

85. $\frac{x+4}{x-4} \div \frac{x^2-16}{4-x}$

- a. $\frac{x+4}{x-4}$
b. $\frac{1}{4-x}$

- c. $\frac{1}{x-4}$
d. $\frac{1}{2-x}$

Find the difference.

86. $\frac{c+2}{d} - \frac{c-1}{d}$

- a. $\frac{1}{d}$
b. $\frac{3}{d}$

- c. $\frac{2c+3}{d}$
d. $\frac{2c+1}{d}$

87. $\frac{5}{x+3} - \frac{9}{x-3}$

- a. $\frac{-4x-42}{x^2-9}$
b. $\frac{-4}{x-3}$

- c. $\frac{1}{x^2-9}$
d. $\frac{-4x-42}{x+3}$

88. $\frac{5}{x^2-15x+56} - \frac{2}{x-7}$

- a. $\frac{3}{x^2-16x+63}$
b. $\frac{-2x-3}{x^2-15x+56}$

- c. $\frac{-2x+21}{x^2-15x+56}$
d. $\frac{-2x-11}{x^2-15x+56}$

Find the sum.

89. $\frac{4}{x+9} + \frac{3}{x-9}$

a. $\frac{7}{x+9}$

b. $\frac{7x-9}{x^2-81}$

c. $\frac{7}{x^2-81}$

d. $\frac{7x-9}{7}$

90. The production rate of a small factory is modeled by $\frac{x+21}{2x(x+5)}$, while the production rate of another factory is modeled by $\frac{9x+16}{2x(x+5)}$. Which is a model for the combined production rate of the two factories?

a. $\frac{x+21}{9x+16}$

b. $\frac{10x+37}{2x^2+10}$

c. $\frac{10x+37}{2x(x+5)}$

d. $\frac{9x^2+37}{2x^2+10}$

Solve the equation:

91. $\frac{x-6}{x-3} = \frac{x+8}{x-2}$

a. $\frac{36}{13}$

b. $\frac{12}{13}$

c. 12

d. 4

92. $\frac{1}{w+3} - \frac{3}{w-2} = 0$

a. $\frac{11}{2}$

b. $\frac{7}{2}$

c. $\frac{11}{4}$

d. none of these

Solve the equation and check your answer.

93. $\frac{x}{x-8} + \frac{6}{x-4} = \frac{x^2}{x^2-12x+32}$

a. 20

b. 8

c. 24

d. 27

94. $\frac{x}{x^2-49} + \frac{7}{x-7} = \frac{1}{x+7}$

a. -8

b. 7

c. 8

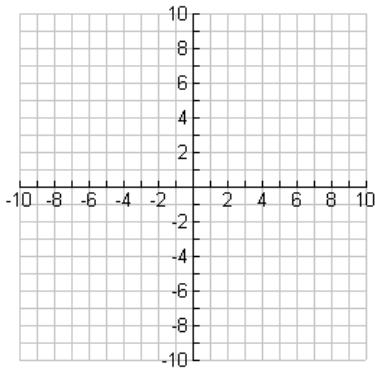
d. no solution

Short answer:

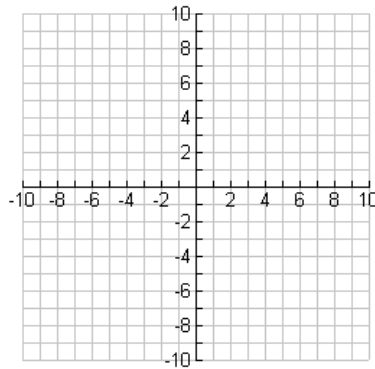
95. Expand the following $(x-5)^3$

96. Graph the following:

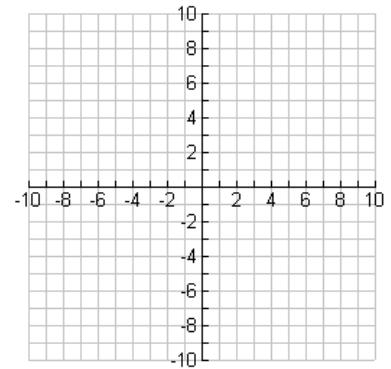
a. $f(x) = |x|$



b. $f(x) = |x - 2| + 1$

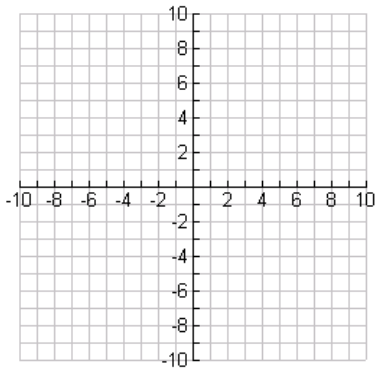


c. $f(x) = 3|x|$

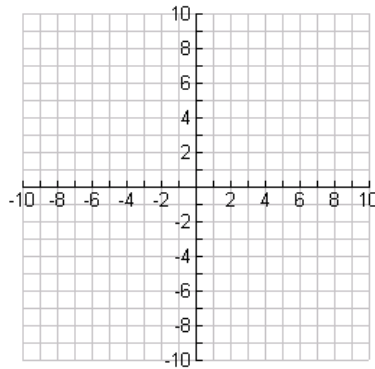


97. Graph the following:

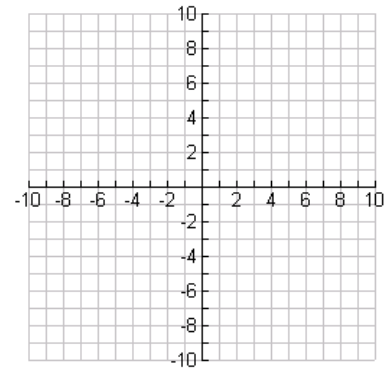
a. $f(x) = x^3$



b. $f(x) = x^3 - 1$



c. $f(x) = -x^3 + 3$



98. Factor the following:

a. $8x^3 - 16x^2 + 32x - 64$

b. $x^3 + 3x^2 + 9x + 27$

