

Section 1.2 The Real Number Line

1. If $x \in [-3, \infty)$, then

(a) $x > -3$

(b) $x \geq -3$

(c) $x < -3$

(d) $x \leq -3$

2. If x is positive, then

(a) $x > 0$

(b) $x \geq 0$

(c) $x < 0$

(d) $x \leq 0$

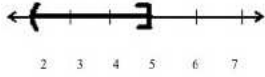
3. If $x \in (-2, 1]$, then

(a) $-2 \leq x < 1$

(b) $-2 < x \leq 1$

(c) $-2 > x \geq 1$

(d) $-2 < x \geq 1$



4. Which inequality corresponds to this graph?

- (a) $2 \leq x \leq 5$
- (b) $2 < x \leq 5$
- (c) $2 \leq x < 5$
- (d) $2 < x < 5$

5. Translate: x is greater than -15 and at most 13 .

- (a) $-15 > x \geq 13$
- (b) $-15 \leq x \leq 13$
- (c) $-15 < x < 13$
- (d) $-15 < x \leq 13$

6. If $-2 < x \geq 3$, then

- (a) $x \in (-2, 3]$
- (b) $x \in (-\infty, -2) \cup [3, \infty)$
- (c) $x \in [-2, 3)$
- (d) this is not possible

7. **Sense or Nonsense:** $-4 > x < 1$

- (a) I am confident that this makes sense.

- (b) I think this makes sense, but I am not certain.
- (c) I think this is nonsense, but I am not certain.
- (d) I am confident that this is nonsense.

8. **Sense or Nonsense:** $0 \geq x \geq 2$

- (a) I am confident that this makes sense.
- (b) I think this makes sense, but I am not certain.
- (c) I think this is nonsense, but I am not certain.
- (d) I am confident that this is nonsense.

9. **Sense or Nonsense:** $-4 < x \leq 1$

- (a) I am confident that this makes sense.
- (b) I think this makes sense, but I am not certain.
- (c) I think this is nonsense, but I am not certain.
- (d) I am confident that this is nonsense.

10. If $-4 > x \geq 3$, then

- (a) $x \in (-4, 3]$
- (b) $x \in (-\infty, -4) \cup [3, \infty)$
- (c) $x \in [-4, 3)$
- (d) this is not possible

11. **Sense or Nonsense:** $[-8, 2]$

- (a) I am confident that this makes sense.
- (b) I think this makes sense, but I am not certain.
- (c) I think this is nonsense, but I am not certain.
- (d) I am confident that this is nonsense.

12. **Sense or Nonsense:** $(-\infty, 2]$

- (a) I am confident that this makes sense.
- (b) I think this makes sense, but I am not certain.
- (c) I think this is nonsense, but I am not certain.
- (d) I am confident that this is nonsense.

13. **Sense or Nonsense:** $(\infty, 10]$

- (a) I am confident that this makes sense.
- (b) I think this makes sense, but I am not certain.
- (c) I think this is nonsense, but I am not certain.
- (d) I am confident that this is nonsense.

14. **True or False:** $8 + 6 \div 2 \times 3^2 = 35$

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident

(d) False, and I am very confident

15. What does 2^5 equal?

(a) 10

(b) 16

(c) 20

(d) 32

16. What is the square of -4?

(a) 16

(b) -16

(c) both (a) and (b) are correct

17. Evaluate: $3x^2 - 7xy + 4y^2$ when $x = -2$ and $y = 3$.

(a) 66

(b) 90

(c) -18

(d) 174

18. Find the value of $\frac{5ab^2}{2a^2 - 3b}$ when $a = 5, b = -1$.

(a) $\frac{-25}{103}$

- (b) $\frac{25}{97}$
- (c) $\frac{-125}{103}$
- (d) $\frac{25}{53}$

19. Write an expression for the quantity “2 less than three times x .”

- (a) $2 - 3x$
- (b) $2 < 3x$
- (c) $3x - 2$
- (d) $3x - 2 = 0$

20. Translate the sentence into algebra: Seven less than the product of 2 and a number.

- (a) $7 - 2n$
- (b) $2n - 7$
- (c) Both are OK

21. Translate the sentence into algebra: Five more than the product of 3 and the square of a number.

- (a) $5 + 3n^2$
- (b) $3n^2 + 5$

(c) Both are OK

22. Translate the sentence into algebra: The sum of 11 and the square of a number all divided by 2.

(a) $11 + \frac{n^2}{2}$

(b) $n^2 + \frac{11}{2}$

(c) $\frac{11 + n^2}{2}$

(d) all of the above

23. Translate the sentence into algebra: The square of the ratio of a number and 5.

(a) $\frac{n^2}{5}$

(b) $\left(\frac{n}{5}\right)^2$

(c) $\frac{n}{5^2}$

(d) all of the above

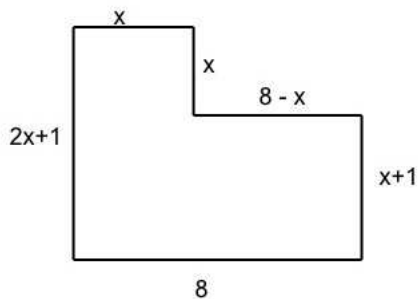
24. Translate the sentence into algebra and simplify: The sum of two consecutive integers.

- (a) $n + 1$
- (b) $2n + 1$
- (c) $n + 2$
- (d) $2n + 2$

25. Translate the sentence into algebra and simplify: The sum of three consecutive even integers.

- (a) $3n + 6$
- (b) $6n + 6$
- (c) $3n + 9$
- (d) $4n + 8$

26. Write and simplify an expression for the perimeter of this figure.



- (a) $5x + 16$
- (b) $6x + 10$
- (c) $5x + 18$

(d) $4x + 18$

27. Write an expression for the cash value of d dimes and q quarters.

(a) $d + q$

(b) $(0.10d)(0.25q)$

(c) $0.10d + 0.25q$

(d) $0.025dq$

28. For any integer n , the expression $2n + 1$ yields an odd integer. What are the next two consecutive odd integers after $2n + 1$?

(a) $2n + 2, 2n + 3$

(b) $2n + 3, 2n + 4$

(c) $2n + 3, 2n + 5$

(d) $2n + 3, 2n + 5$

29. Joan has \$5000 to invest and plans to put part of the money into a stock fund and the rest into a bond fund. If she puts x dollars into the stock fund, how much will she put into the bond fund?

(a) $x - \$5000$

(b) $\$5000 - x$

(c) x

(d) The amount cannot be expressed in terms of x .

30. If d stands for distance, t stands for time, and r stands for rate, then which of the following is not true?

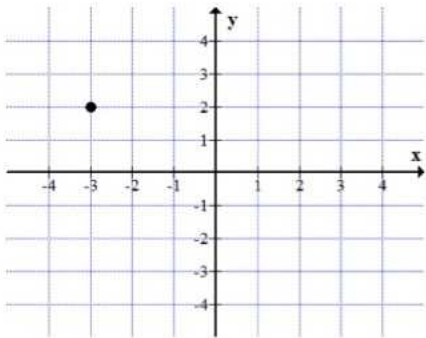
(a) $r = \frac{d}{t}$

(b) $t = \frac{d}{r}$

(c) $d = rt$

(d) $r = \frac{t}{d}$

31. Name the coordinates of the point.



(a) (2, -3)

(b) (-2, 3)

(c) (3, -2)

(d) (-3, 2)

32. Find the coordinates of the point: The point is 3 units below the x-axis and 4 units to the right of the y-axis.

- (a) (3, 4)
- (b) (-3, 4)
- (c) (4, -3)
- (d) (-4, -3)

33. In which quadrant is the point (8, -11)?

- (a) I
- (b) II
- (c) III
- (d) IV

34. In which quadrant is $x < 0$ and $y < 0$?

- (a) I
- (b) II
- (c) III
- (d) IV

35. Find the distance between (2, -5) and (6, -2).

- (a) 25
- (b) 5

(c) $\sqrt{113}$

(d) $\sqrt{23}$

36. What can you say about the points $(1, 4)$, $(-2, 0)$, and $(5, 1)$?

(a) They are collinear

(b) They are the vertices of an isosceles triangle

(c) They are the vertices of an equilateral triangle

(d) They are the vertices of a right triangle

(e) More than one of the above

37. The endpoints of a line segment are $(1, -5)$ and $(-7, 4)$. What are the coordinates of the midpoint?

(a) $(-6, -1)$

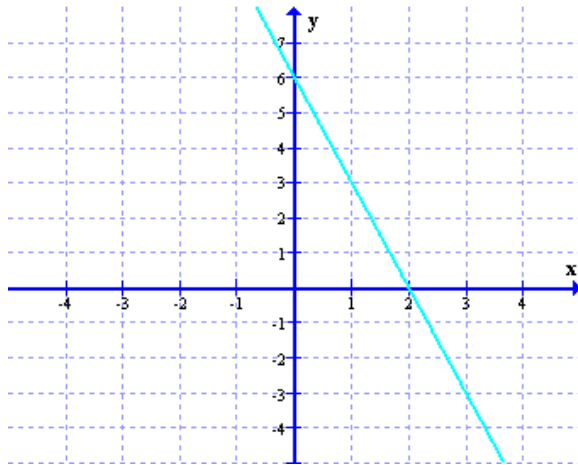
(b) $(-4, 4.5)$

(c) $(8, -9)$

(d) $(-3, -0.5)$

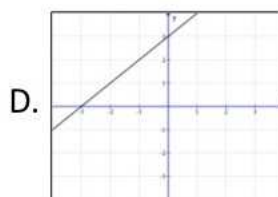
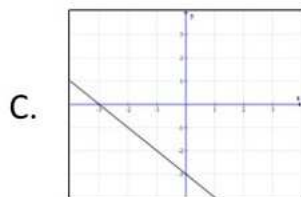
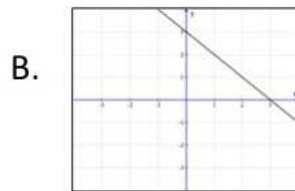
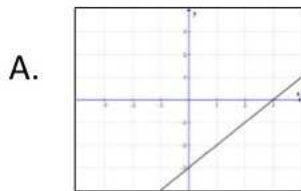
Section 2.3 Graphs of Linear Equations in Two Variables

38. What is the x -intercept of the graph shown below?



- (a) (0,2)
- (b) (2,0)
- (c) (0, -3)
- (d) (6, 0)
- (e) (0, 6)

39. Which shows the graph of $y = x - 3$?



Section 2.4 Solving Linear Equations in One Variable Using the Addition-Subtraction Principle

40. If I add 3 to a number and the result is 12, what number did I start with?

- (a) 3
- (b) 9
- (c) 12
- (d) 15

41. If I subtract 5 from a number and the result is 6, what number did I start with?

- (a) 1
- (b) 5
- (c) 6
- (d) 11

42. Solve for x : $x + 7 = 8$

- (a) $x = 1$
- (b) $x = 7$
- (c) $x = 8$
- (d) $x = 15$

43. Solve for t : $t - 2 = 10$

- (a) $t = 2$
- (b) $t = 8$
- (c) $t = 10$
- (d) $t = 12$

44. True or False: The solutions to $x + 3 = 7$ are the same as the solutions to $x + 3 - 3 = 7 - 3$.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

45. True or False: The solutions to $y - 8 = 20$ are the same as the solutions to $y - 8 + 8 = 20 - 8$.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

46. What is the solution set: $2(x - 3) = 5x - 3(x + 2)$?

- (a) $\{0\}$

- (b) $\{6\}$
- (c) $\{12\}$
- (d) $\{\text{all real numbers}\}$
- (e) no solution

47. **True or False:** $5(3x - 2) = 5$ and $3(5x - 2) = 9$ are equivalent equations.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

48. Nadia gives Amy \$3. If Amy now has \$17, how much money did Amy start with? Set up and solve an equation.

- (a) \$3
- (b) \$14
- (c) \$17
- (d) \$20

Section 2.5 Solving Linear Equations in One Variable Using the Multiplication-Division Principle

49. If I multiply a number by 4 and the result is 20, what number did I start with?

- (a) 5
- (b) 16
- (c) 24
- (d) 80

50. If I divide a number by 3 and the result is 7, what number did I start with?

- (a) $\frac{7}{3}$
- (b) 4
- (c) 11
- (d) 21

51. Solve for x : $2x = 18$

- (a) $x = 9$
- (b) $x = 16$
- (c) $x = 20$
- (d) $x = 36$

52. Solve for x : $5x = -10$

- (a) $x = 2$
- (b) $x = -2$
- (c) $x = 50$
- (d) $x = -50$

53. True or False: $\frac{x}{8}$ means the same thing as $x \div 8$.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

54. Solve for x : $\frac{x}{6} = 5$

- (a) $x = -1$
- (b) $x = \frac{5}{6}$
- (c) $x = 11$
- (d) $x = 30$

55. Solve for x : $-\frac{x}{3} = 6$

- (a) $x = -2$
- (b) $x = 2$
- (c) $x = -18$

(d) $x = 18$

56. True or False: The solutions to $4x = 28$ are the same as the solutions to $\frac{4x}{4} = \frac{28}{4}$.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

57. On Wednesday Frank ate twice as many grapes as he ate on Monday. If he ate 28 grapes on Wednesday, how many did he eat on Monday? Set up and solve an equation.

- (a) 14 grapes
- (b) 26 grapes
- (c) 28 grapes
- (d) 56 grapes

58. The area of a triangle is $A = \frac{1}{2}b \cdot h$

- (a) $b = \frac{2A}{h}$
- (b) $b = \frac{A - h}{2}$

(c) $b = \frac{1}{2}A \cdot h$

(d) $b = \frac{A}{2h}$

59. Find the x-intercept of the graph of $2x - 3y + 12 = 0$.

(a) (2, 0)

(b) (-3, 0)

(c) (-4, 0)

(d) (-6, 0)

60. Find the y-intercept of the graph $2x - 3y + 12 = 0$.

(a) (0, -3)

(b) (0, -6)

(c) (0, 4)

(d) (0, -4)

61. What is the decimal form of 7%?

(a) 0.7

(b) 0.70

(c) 0.07

(d) 0.007

62. What is the fractional form of 44%?

(a) $\frac{44}{100}$

(b) $\frac{22}{50}$

(c) $\frac{11}{25}$

(d) all of the above

63. Find the ratio of 24 inches to 2 yards using the same units.

(a) 12 to 1

(b) 1 to 1

(c) 1 to 3

(d) 3 to 1

64. Use unit prices to determine which is the the better buy

(a) 10 $\frac{1}{2}$ -ounce box of cookies for \$2.50

(b) 16 -ounce box of cookies for \$4.00

(c) same unit price

65. A Coach handbag costs Macy's \$140, and the selling price is \$252. What is the mark up rate?

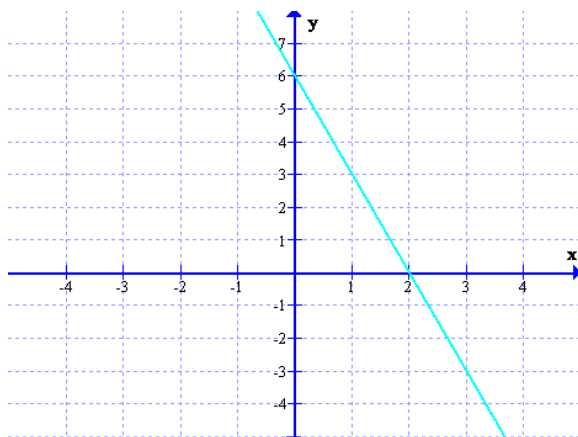
- (a) 44%
- (b) 54%
- (c) 60%
- (d) 80%

66. The list price of a memory card is \$29.99. The selling price is \$18.99. What is the discount rate?

- (a) 66.7%
- (b) 63.3%
- (c) 36.7%
- (d) 33.3%

Section 3.1 Slope of a Line and Applications of Slope

67. What is the slope of the line shown in the graph below?

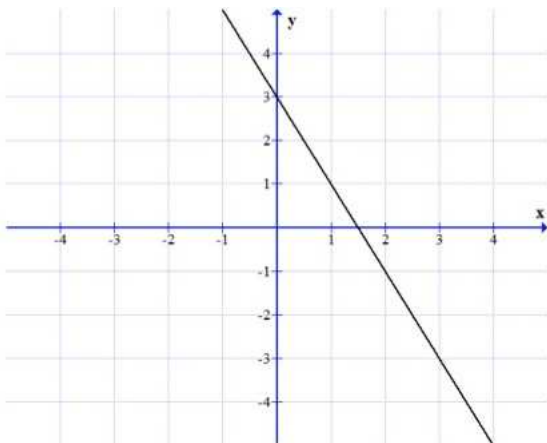


- (a) 3
- (b) -3
- (c) $\frac{1}{3}$
- (d) $-\frac{1}{3}$
- (e) This line has no slope.

68. What is the slope of the line that passes through the points $(0, 2)$ and $(-2, -4)$?

- (a) 1
- (b) -1
- (c) $\frac{1}{3}$
- (d) 3
- (e) Undefined

69. What is the slope of this line?



- (a) $\frac{1}{2}$

- (b) 2
- (c) $\frac{-1}{2}$
- (d) -2

70. Calculate the slope of the line through the points (4, -3) and (1, 3).

- (a) 2
- (b) -2
- (c) $\frac{1}{2}$
- (d) $\frac{-1}{2}$

71. Calculate the slope of the line through the points (6, -8) and (6, 2).




- (a) 10
- (b) $\frac{1}{10}$
- (c) 0
- (d) undefined

72. True or False: All vertical lines have slope 0.

- (a) True, and I am very confident

- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

73. What does this line look like $2x + 1 = 7$?

- (a) horizontal 
- (b) vertical
- (c) up and to the right 
- (d) down and to the right 

74. Which of the following functions represents a linear function with slope 3 and y -intercept -4 ?

- (a) $y = -4x + 3$
- (b) $y = 3x - 4$
- (c) $y - 2 = 3(x - 2)$
- (d) Both (a) and (b)
- (e) Both (b) and (c)

75. Which equation describes the linear function that has slope 3 and x -intercept 4?

- (a) $y = 3x + 4$

- (b) $y = 4x + 3$
- (c) $y = 3x - 12$
- (d) $y = 3x + 12$

76. The relationship between the latitude L of a city in the Northern Hemisphere and its average annual temperature T is modeled by the function $T = -0.68L + 89.5$. The slope of this linear function means

- (a) That temperature at the equator would be 89.5° .
- (b) For every degree increase in latitude the average annual temperature increases by 89.5° .
- (c) For every degree increase in latitude the average annual temperature increases by 0.68° .
- (d) For every degree increase in latitude the average annual temperature decreases by 0.68° .

77. The relationship between the latitude L of a city in the Northern Hemisphere and its average annual temperature T is modeled by the function $T = -0.68L + 89.5$. The vertical intercept of this linear function means

- (a) That temperature at the equator would be 89.5° .
- (b) For every degree increase in latitude the average annual temperature increases by 89.5° .
- (c) That temperature at the equator would be -0.68° .

- (d) For every degree increase in latitude the average annual temperature decreases by 0.68° .

78. Which equation describes a line that is parallel to the graph of $y = -2x + 4$?

- (a) $y = \frac{1}{2}x - 3$
- (b) $y = 2x - 3$
- (c) $y = \frac{1}{2}x + 4$
- (d) $y = -\frac{1}{2}x - 3$
- (e) $y = -2x - 3$

79. Are the given lines parallel, perpendicular, or neither?

Line 1: $2x + 4y = 12$

Line 2: $2x - x = 4$

- (a) parallel
- (b) perpendicular
- (c) neither

80. Which equation describes a line that is perpendicular to the graph of $y = -2x + 4$?

- (a) $y = -\frac{1}{2}x - 3$
- (b) $y = 2x - 3$
- (c) $y = -\frac{1}{2}x + 4$

(d) $y = \frac{1}{2}x - 3$

(e) $y = -2x - 3$

81. Find the equation of the line that passes through the point $(1, 4)$ and is perpendicular to the line given by $3x - 2y = 6$.

(a) $y = \frac{3}{2}x + \frac{5}{2}$

(b) $y = \frac{3}{2}x - \frac{11}{2}$

(c) $y = -\frac{2}{3}x + \frac{14}{3}$

(d) $y = -\frac{2}{3}x - \frac{10}{3}$

82. Name the slope and y-intercept of $4x + 2y = 8$

(a) slope = 4, y-intercept = 8

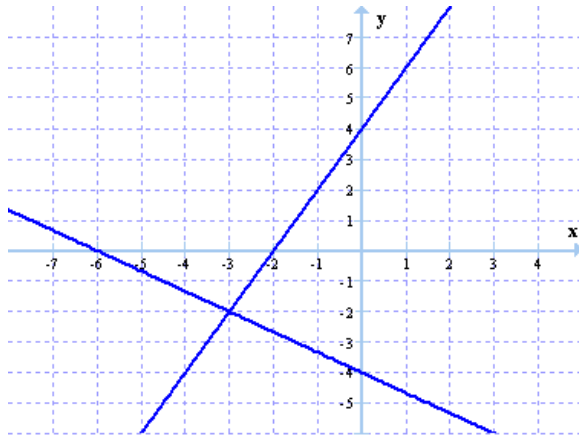
(b) slope = -4, y-intercept = 8

(c) slope = 2, y-intercept = 4

(d) slope = -2, y-intercept = 4

Section 3.3 Solving Systems of Linear Equations in Two Variables Graphically and Numerically

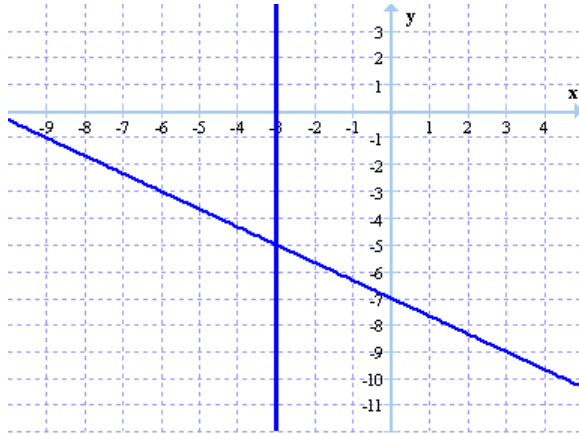
83. The graph of a system of linear equations is given below.



Which of the following is the solution to the system?

- (a) $(-237, 318)$
- (b) $(-3, -2)$
- (c) $(-6, 0)$
- (d) No solution
- (e) Infinitely many solutions

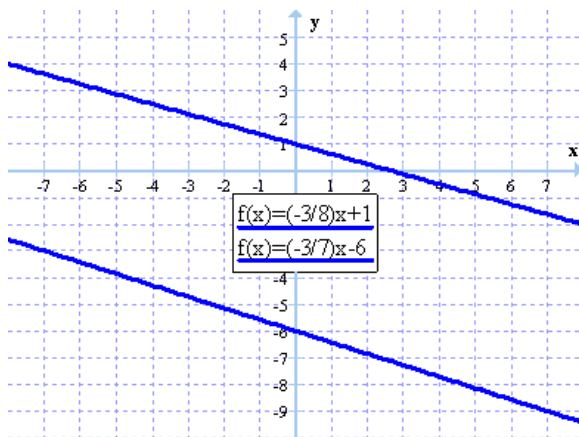
84. The graph of a system of linear equations is given below.



Which of the following is the solution to the system?

- (a) $(-3, -5)$
- (b) $(-3, -7)$
- (c) No solution
- (d) Infinitely many solutions

85. The graph of a system of linear equations is given below, along with the equations themselves.



Which of the following is the solution to the system?

- (a) $(0, -6)$

- (b) $(0, 1)$
- (c) $(3, 0)$
- (d) $(-392/3, 50)$
- (e) No solution
- (f) Infinitely many solutions

86. A table of values for a system of linear equations is given below.

x	-8	-6	-4	-2	0	2	4	6
y_1	-6	-3	0	3	6	9	12	15
y_2	2	1	0	-1	-2	-3	-4	-5

Which of the following is the solution to the system?

- (a) $(0, 0)$
- (b) $(-4, 0)$
- (c) $(0, 6, -2)$
- (d) No solution
- (e) Infinitely many solutions

87. A table of values for a system of linear equations is given below.

x	-2	-1	0	1	2	3	4	5
y_1	-3	-1	1	3	5	7	9	11
y_2	5	3	1	-1	-3	-5	-7	-9

Which of the following is the solution to the system?

- (a) $(0, 1)$
- (b) $(-1, -1)$
- (c) $(-1, 3)$
- (d) No solution
- (e) Infinitely many solutions

88. A table of values for a system of linear equations is given below.

x	-2	-1	0	1	2	3	4	5
y_1	0	-1	-2	-3	-4	-5	-6	-7
y_2	-10	-9	-8	-7	-6	-5	-4	-3

Which of the following is the solution to the system?

- (a) $(-5, -5)$
- (b) $(3, -5)$
- (c) $(3, -5, -5)$
- (d) No solution
- (e) Infinitely many solutions

89. A table of values for a system of linear equations is given below.

x	-4	-3	-2	-1	0	1	2	3
y_1	5	5	5	5	5	5	5	5
y_2	-4	-3	-2	-1	0	1	2	3

Which of the following is the solution to the system?

- (a) $(-4, 5)$
- (b) $(0, 0)$
- (c) $(5, 5)$
- (d) No solution
- (e) Infinitely many solutions

90. A table of values for a system of linear equations is given below.

x	4	7	10	13	16	19	22	25
y_1	3	0	-3	-6	-9	-12	-15	-18
y_2	3	0	-3	-6	-9	-12	-15	-18

Which of the following is the solution to the system?

- (a) $(4, 3)$
- (b) $(0, 0)$
- (c) No solution
- (d) Infinitely many solutions

91. Which of the following ordered pairs is a solution to the system

$$f(x) = \begin{cases} -2x + 3y = 11 \\ -2x + 2y = 4 \end{cases} ?$$

(a) $(-4, 1)$

(b) $(1, 3)$

(c) $(5, 7)$

(d) $(-1, 3)$

92. What is the solution to the following system of equations?

$$2x + y = 3$$

$$3x - y = 7$$

(a) $x = 4$ and $y = -5$

(b) $x = 4$ and $y = 5$

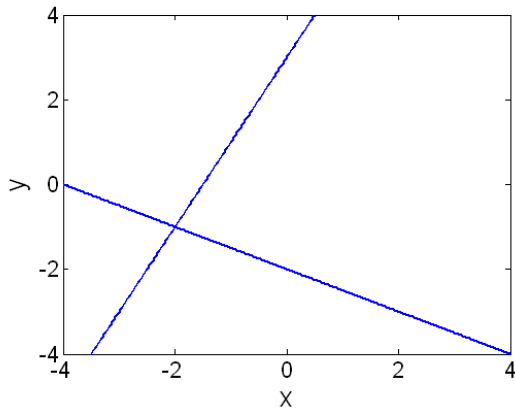
(c) $x = 2$ and $y = -1$

(d) $x = 2$ and $y = 1/2$

(e) There are an infinite number of solutions to this system.

(f) There are no solutions to this system.

93. Which of the following systems of equations could be represented in the graph below?



- (a) $3x + 3y = -6, x + 2y = 3$
- (b) $x - y = -5, 2x + y = 4$
- (c) $-8x + 4y = 12, 2x + 4y = -8$
- (d) $-x + 3y = 9, 2x - y = 4$

94. What is the solution to the following system of equations?

$$\begin{aligned} 2x + y &= 3 \\ 4x + 2y &= 6 \end{aligned}$$

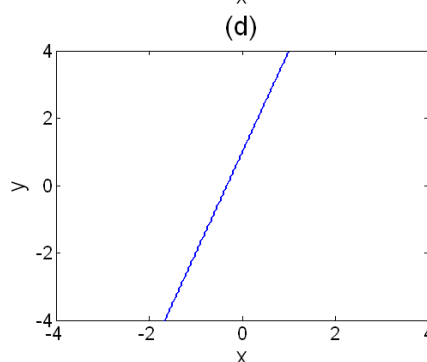
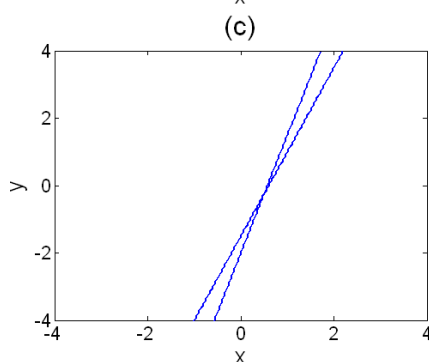
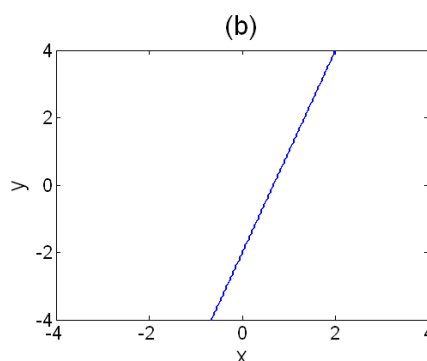
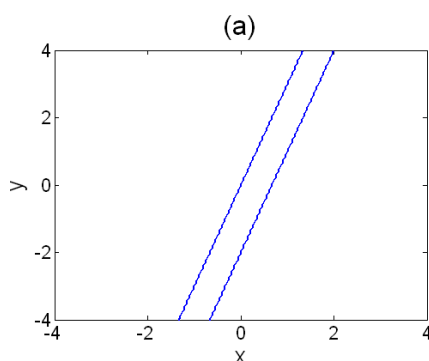
- (a) $x = 0$ and $y = 0$
- (b) $x = 2$ and $y = -1$
- (c) $x = 0$ and $y = 1$
- (d) $x = 0$ and $y = 3$
- (e) There are an infinite number of solutions to this system.
- (f) There are no solutions to this system.

95. Without actually solving, what can you say about the system $f(x) = \begin{cases} y = 3x + 7 \\ y = 3x - 2 \end{cases}$?

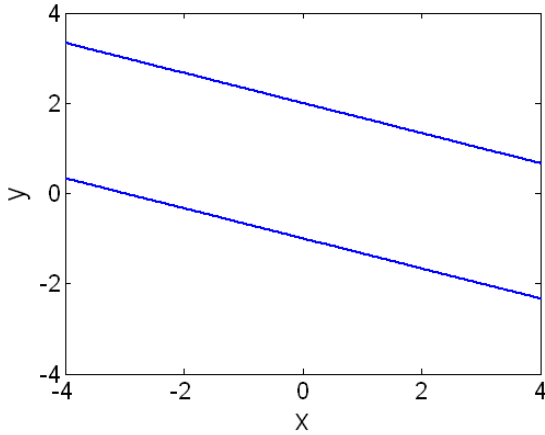
- (a) consistent, one solution
- (b) consistent, dependent (infinitely many solutions)
- (c) inconsistent

96. Which of the graphs below could represent the following linear system?

$$\begin{aligned} 3x - y &= 2 \\ -9x + 3y &= -6 \end{aligned}$$



97. Which of the following systems of equations could be represented in the graph below?



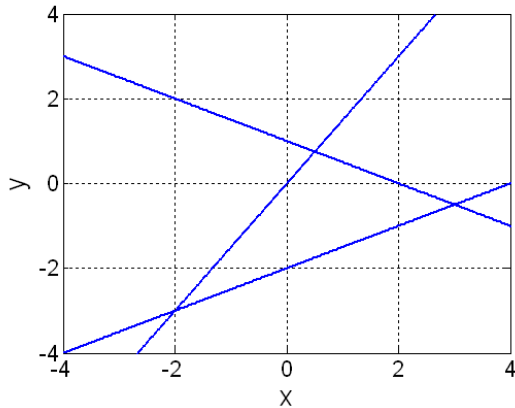
- (a) $-x + 3y = 6, 2x + 6y = -6$
- (b) $-x + 3y = 6, 2x + 6y = 12$
- (c) $x + 3y = 6, 2x + 6y = 12$
- (d) $x + 3y = 6, x + 3y = -3$

98. What is the solution to the following system of equations?

$$\begin{aligned} -3x + 2y &= 4 \\ 12x - 8y &= 10 \end{aligned}$$

- (a) $x = -4/3$ and $y = 0$
- (b) $x = 1/2$ and $y = -1/2$
- (c) $x = 0$ and $y = 2$
- (d) $x = 1/3$ and $y = 5/2$
- (e) There are an infinite number of solutions to this system.
- (f) There are no solutions to this system.

99. We have a system of three linear equations with two unknowns, as plotted in the graph below. How many solutions does this system have?



- (a) 0
- (b) 1
- (c) 2
- (d) 3
- (e) Infinite

100. A system of linear equations could *not* have exactly _____ solutions.

- (a) 0
- (b) 1
- (c) 2
- (d) infinite
- (e) All of these are possible numbers of solutions to a system of linear equations.

101. Is the ordered triple $(2, -1, 3)$ a solution of the following linear system?

$$\begin{cases} 5x + 3y - 2z = 1 \\ x - y + z = 6 \\ 2x + 2y - z = -1 \end{cases}$$

- (a) Yes, and I am very confident.
- (b) Yes, but I am not very confident.
- (c) No, but I am not very confident.
- (d) No, and I am very confident.

102. Solve the following linear system.

$$\begin{cases} x + 5y + 3z = 7 \\ 2x + 11y - 4z = 6 \end{cases}$$

- (a) $\{(7z + 47, -2z - 8, z)\}$
- (b) $\{(-53z + 47, 10z - 8, z)\}$
- (c) $\{(47z + 47, -10z - 8, z)\}$
- (d) There is no solution. (The solution set is the empty set.)

Section 4.2 Solving Linear Inequalities Using the Multiplication - Division Principle

103. True or False: If $-x < 0$ then $x < 0$.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

104. Which of the following inequalities is equivalent to $-x > 6$?

- (a) $x < 6$
- (b) $x < -6$
- (c) $x > 6$
- (d) $x > -6$

Section 4.3 Solving Compound Inequalities

105. Which of the following is equivalent to $3 < x + 5 < 9$?

- (a) $3 < x < 4$
- (b) $-2 < x < 9$

- (c) $-2 < x < 4$
- (d) $-2 < x < 14$
- (e) $8 < x < 4$

106. Solve the inequality: $4 < 2 - 2x \leq 14$

- (a) $-1 > x \geq -6$
- (b) $1 > x \geq -6$
- (c) $-2 > x \geq -12$
- (d) $-1 > x \geq -12$

107. Solve: $x^2 - 7x + 10 > 0$.

- (a) $(-\infty, 2] \cup [5, \infty)$
- (b) $(-\infty, 2) \cup (5, \infty)$
- (c) $[2, 5]$
- (d) $(2, 5)$

108. Solve: $\frac{x + 2}{x + 1} \geq 4$.

- (a) $[-\frac{2}{3}, \infty)$
- (b) $(-\infty, -\frac{2}{3}]$
- (c) $[-1, -\frac{2}{3}]$

(d) $(-1, -\frac{2}{3}]$

109. Solve: $\frac{(x+1)(2-x)(x-3)^2}{(x^2+16)(x+5)} \geq 0.$

(a) $(-\infty, -5] \cup [-1, 2] \cup \{3\}$

(b) $(-\infty, -5] \cup [-1, 2]$

(c) $(-\infty, -5) \cup [-1, 2] \cup \{3\}$

(d) $(-\infty, -5) \cup [-1, 2]$

110. **True or False:** $2(3x^4)(5y^2) = (2 \cdot 3x^4) \cdot (2 \cdot 5y^2)$

(a) True, and I am very confident

(b) True, but I am not very confident

(c) False, but I am not very confident

(d) False, and I am very confident

111. What does $3^2 \cdot 3^4$ equal?

(a) 3^6

(b) 3^8

(c) 9^6

(d) 9^8

112. What does $(5x^4)^2$ equal?

- (a) $5x^6$
- (b) $10x^8$
- (c) $25x^6$
- (d) $25x^8$

113. What does $(3x^2y)(8x^4y^2)$ equal?

- (a) $24x^6y^2$
- (b) $24x^6y^3$
- (c) $24x^8y^2$
- (d) $24x^8y^3$

114. What does $5^6/5^2$ equal?

- (a) 5^3
- (b) 5^4
- (c) 1^3
- (d) 1^4

115. Simplify: $\frac{24a^6b^3}{4a^2b}$

- (a) $6a^4b^2$
- (b) $6a^3b^3$
- (c) $6a^8b^4$

(d) $6a^3b^2$

116. What is $5x^0 + (6y)^0$?

(a) 2

(b) 6

(c) 11

(d) $5x + 1$

Section 5.3 Negative Exponents and Scientific Notation

117. Which of the following expressions is equivalent to

$$\frac{x^{-2}y^3z^{-4}}{x^{-3}y^5z^5}$$

(a) $x^{2/3}y^{3/5}z^{-4/5}$

(b) xy^2z^9

(c) $x^{-5}y^8z$

(d) $\frac{x}{y^2z^9}$

118. Simplify: $\left(\frac{x^2}{y}\right)^{-3}$

(a) $\frac{x^6}{y^3}$

(b) $\frac{y^3}{x^6}$

(c) $-\frac{y^3}{x^6}$

(d) $\frac{-3x^2}{y}$

119. Simplify: $\frac{5x^6y^{-3}}{30x^2y^{-2}}$

(a) $\frac{x^4}{6y^5}$

(b) $\frac{x^3y^5}{6}$

(c) $\frac{6x^4}{y}$

(d) $\frac{x^4}{6y}$

Section 5.4: Adding and Subtracting Polynomials

120. Which of the following is NOT a polynomial expression?

- (a) $3x^2 - 4x - \sqrt{17}$
- (b) $5x^{1/2} + 7$
- (c) $mx + b$
- (d) 15
- (e) More than one of the above are not polynomial expressions.

121. What are the terms of the algebraic expression $3y^2 - 5xy + 7$?

- (a) y^2 , xy , and 7
- (b) $3y^2$ and $5xy$
- (c) $3y^2$ and $-5xy$
- (d) $3y^2$, $5xy$, and 7
- (e) $3y^2$, $-5xy$, and 7

122. What is the degree of the polynomial $y = 3x^2 + 2x^7 + 10x$?

- (a) 2
- (b) 3
- (c) 7
- (d) 10

123. What is the degree of $7x^3 - 4x^6 + 9x^2 + 2$?

- (a) 3
- (b) 4
- (c) 6
- (d) 7

124. What is the leading term of the polynomial $y = 3x^2 + 2x^7 - 11x$?

- (a) $3x^2$
- (b) $2x^7$
- (c) $-11x$
- (d) x^7
- (e) 2

125. What is the leading coefficient of the polynomial $y = 3x^2 + 2x^7 + 10x$?

- (a) 2
- (b) 3
- (c) 7
- (d) 10

126. **True or False:** The coefficients of $-4x^3 + 6x^2 - x + 9$ are $-4, 6, -1,$ and 9 .

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

127. What property is illustrated by $5x^2 + 11x^2 = (5 + 11)x^2$?

- (a) Associative property of addition
- (b) Commutative property of multiplication
- (c) Distributive property
- (d) Associative property of multiplication

128. Which of the following shows a pair of like terms?

- (a) $3x^2$ and $3x$
- (b) $3x^2$ and $4x^2$
- (c) $3x^2$ and $2x^3$
- (d) $3x^2$ and 3
- (e) All of the above

129. Simplify: $2x^2y - 3xy^2 + 7xy^2 + 8x^2y$

- (a) $14x^2y^2$
- (b) $-x^2y + 15xy^2$

(c) $9x^2y + 5xy^2$

(d) $10x^2y + 4xy^2$

130. Simplify completely: $(3x^4 - x^2 + 7) + (-9x^2 + 1)$

(a) $3x^4 - x^2 + 7 + 9x^2 - 1$

(b) $-27x^6 + 12x^4 - 64x^2 + 7$

(c) $-27x^8 + 12x^4 - 64x^2 + 7$

(d) $3x^4 - 10x^2 + 8$

131. Find the sum $(-6x^2 - 7x + 16) + (-8x^3 - 9x^2 - 16)$.

(a) $-14x^5 - 16x^3$

(b) $-14x^5 - 16x^3 + 32$

(c) $-14x^3 - 16x^2 + 32$

(d) $-8x^3 - 15x^2 - 7x$

132. Simplify completely: $(3x^4 - x^2 + 7) - (-9x^2 + 1)$

(a) $3x^4 - x^2 + 7 + 9x^2 - 1$

(b) $3x^4 + 8x^2 + 6$

(c) $3x^4 - 8x^2 + 6$

(d) $3x^4 - 10x^2 + 8$

133. Find the difference: $(7x^2 - 2x + 11) - (9x^3 + 9x^2 + 11)$.

- (a) $-9x^3 - 2x^2 - 2x$
- (b) $-9x^3 + 16x^2 - 2x + 22$
- (c) $-2x^3 - 11x^2 + 22$
- (d) $-9x^3 + 16x^2 - 2x$

134. Perform the indicated operations and simplify:

$$(9x^2 + 8x - 2) - [(-6x^3 + 3x^2 + 7) + (-2x + 15)]$$

- (a) $-6x^3 + 6x^2 + 6x + 20$
- (b) $6x^3 + 6x^2 + 10x - 24$
- (c) $6x^3 + 12x^2 + 6x + 20$
- (d) $-6x^3 + 12x^2 + 10x - 24$
- (e) $6x^3 + 6x^2 + 6x + 20$

135. $P(x) = -x^2 + 17x - 30$ represents the profit, in Euros, gained from selling x units of a product. What is the value of $P(5)$?

- (a) -30
- (b) 12
- (c) 30
- (d) 80

136. $P(x) = -x^2 + 17x - 30$ represents the profit, in Euros, gained from selling x units of a product. What is the contextual meaning of $P(5) = 30$?

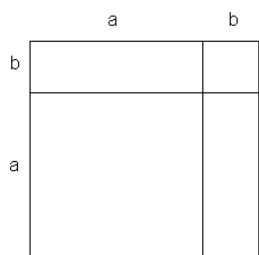
- (a) When 30 units are sold, the profit is 5 Euros.
- (b) When 5 units are sold, the profit is 30 Euros.
- (c) When 30 people sell units, their profit is 5 Euros.
- (d) When 5 people sell units, their profit is 30 Euros.

137. What is the polynomial expression for “Eight less than the opposite of four y ”?

- (a) $8 - (-4y)$
- (b) $-8 + 4y$
- (c) $8 - (-yyyyy)$
- (d) $-4y - 8$
- (e) $-yyyyy - 8$

Section 5.5: Multiplying Polynomials

138. Which are valid representations of the area of the outer square?



- (a) $(a + b)^2$
- (b) $a^2 + b^2$
- (c) $a^2 + 2ab + b^2$
- (d) Both (a) and (b)
- (e) Both (a) and (c)
- (f) All of (a), (b), and (c)

139. Using the distributive law, simplify: $x(4x - 3) + 6(x^2 + 5x) =$

- (a) $10x^2 + 27x$
- (b) $7x^2 + 30x$
- (c) $37x^2$
- (d) $10x^2 + 30x - 3$

140. Simplify by removing parentheses: $5x - 2x[3 + 2(x - 7)] =$

(a) $15x^2 - 105x$

(b) $6x^2 - 33x$

(c) $-4x^2 + 27x$

(d) $-4x^2 - 17x$

141. Find the product: $3x^2(5x^3 - 11x^2 + 4x - 7)$

(a) $15x^6 - 33x^4 + 12x^2 - 21x^2$

(b) $15x^6 - 33x^4 - 9x^2$

(c) $15x^5 - 33x^4 + 12x^3 - 21x^2$

(d) $15x^5 - 33x^4 + 12x^2 - 21x^2$

142. Find the product: $(8n^2 + 9n - 1) \cdot 5n =$

(a) $40n^2 + 45n - 1$

(b) $40n^3 + 45n^2 - 5n$

(c) $40n^2 + 45n - 5n$

(d) $40n^3 + 9n - 1$

143. Simplify completely: $(3x^4 - x^2 + 7)(-9x^2 + 1)$

(a) $3x^4 - x^2 + 7 + 9x^2 - 1$

(b) $-27x^6 + 12x^4 - 64x^2 + 7$

(c) $-27x^8 + 12x^4 - 64x^2 + 7$

(d) $3x^4 - 10x^2 + 8$

144. Find the product and simplify: $(2x + 5)(3x + 2)$

(a) $6x^2 + 10$

(b) $6x^2 + 19x + 10$

(c) $6x^2 + 17x + 10$

(d) $6x^2 + 5x + 10$

145. Multiply and simplify: $(7x + 2)(x^2 + 8x - 3)$

(a) $7x^3 + 2x^2 + 37x - 6$

(b) $7x^3 + 58x^2 + 8x - 3$

(c) $7x^3 + 58x^2 - 5x - 6$

(d) $7x^3 + 2x^2 + 16x - 6$

Section 5.6 Special Products of Binomials

146. What is $(3x - 5)^2$?

(a) $9x^2 - 25$

(b) $9x^2 - 15x - 25$

(c) $9x^2 - 15x + 25$

(d) $9x^2 - 30x + 25$

147. Find the product and simplify: $(3x - 4)^2$

(a) $9x^2 - 16$

(b) $9x^2 + 16$

(c) $9x^2 - 24x + 16$

(d) $9x^2 + 24x - 16$

148. What is $(2x - 7)^2$?

(a) $4x^2 - 49$

(b) $4x^2 - 14x - 49$

(c) $4x^2 - 28x + 49$

(d) $4x^2 - 14x + 49$

149. Multiply and simplify: $(7x + 2)^2$

(a) $49x^2 - 28x + 4$

(b) $49x^2 + 28x + 4$

(c) $49x^2 + 4$

(d) $49x^2 - 4$

150. Find the product and simplify: $(3x - 4)(3x + 4)$

(a) $9x^2 - 16$

- (b) $9x^2 + 16$
- (c) $9x^2 - 24x - 16$
- (d) $9x^2 + 24x + 16$

151. Multiply and simplify: $(7x + 2)(7x - 2)$

- (a) $49x^2 - 28x + 4$
- (b) $49x^2 + 28x + 4$
- (c) $49x^2 + 4$
- (d) $49x^2 - 4$

152. Find the quotient: $(x^3 - 5x^2 + 2x - 10) \div (x - 5)$

- (a) $x^2 + 2$
- (b) $x^2 + 2x - 10$
- (c) $x^3 + 2x$
- (d) $x^2 - x + 2$

153. Use synthetic division to find the quotient and remainder of $(5x^3 + 6x + 8) \div (x + 2)$.

- (a) $5x^2 - 4x + 16$
- (b) $5x^2 - 16x + 40$
- (c) $5x^2 - 10x + 26 - \frac{44}{x + 2}$
- (d) $5x^2 + 10x + 26 - \frac{60}{x + 2}$

Section 6.1: An Introduction to Factoring Polynomials

154. What is x if $(x - 14) = 0$?

- (a) $x = 14$
- (b) $x = -14$
- (c) $x = 0$
- (d) None of the above

155. What is x if $(2x + 5) = 0$?

- (a) $x = 5$
- (b) $x = -5$
- (c) $x = \frac{5}{2}$
- (d) $x = -\frac{5}{2}$

156. If $x = c$ is a zero, then the corresponding factor is:

- (a) $(x - c)$
- (b) $(x + c)$
- (c) $x = c$
- (d) $xc = 0$

157. If $x = -c$ is a zero, then the corresponding factor is:

- (a) $(x - c)$
- (b) $(x + c)$
- (c) $x = c$
- (d) $xc = 0$

158. If $x = 8$ is a zero, then the corresponding factor is:

- (a) $(x - 8)$
- (b) $(x - 8)^2$
- (c) $(x + 8)$
- (d) $(x + 8)^2$

159. If $x = 0$ is a zero, then the corresponding factor is:

- (a) $(x - 0)$
- (b) x
- (c) $(x + 0)$
- (d) All of the above

160. If $x = -\frac{5}{10}$ is a zero, then the corresponding factor is:

- (a) $(x - \frac{5}{10})$
- (b) $(x - 2)$
- (c) $(2x + 1)$
- (d) $(x - \frac{1}{2})$

(e) None of the above

161. If $x = -\frac{3}{2}$ is a zero, then the corresponding factor is:

(a) $(x - \frac{3}{2})$

(b) $(2x + 3)$

(c) $(3x + 2)$

(d) $(2x - 3)$

(e) None of the above

162. Determine the zeros of $f(x) = (2x - 5)(x + 3)$.

(a) $x = 5, 3$

(b) $x = 5, -3$

(c) $x = \frac{5}{2}, -3$

(d) $x = -2, 5, -3$

(e) None of the above

163. Determine the zeros of $f(x) = x(x + 8)$.

(a) $x = 0, -8$

(b) $x = -8$

(c) $x = 8$

(d) $x = \pm 8$

(e) None of the above

164. $f(x)$ has zeros $x = 3, -5$. What are the factors?

- (a) $(3x)(-5x)$
- (b) $(x + 3)(x - 5)$
- (c) $(x - 3)(x + 5)$
- (d) $(-3x + 5)$

165. $f(x)$ has zeros $x = \frac{5}{7}, -1$. What are the factors?

- (a) $(x + 1)(5x - 7)$
- (b) $(x - 1)(5x + 7)$
- (c) $(x + 1)(7x - 5)$
- (d) $(x - 1)(7x + 5)$

166. True or False: If a value is an x -intercept then it is a root of the polynomial equation.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

167. True or False: The expression $2ax - 7z - 3bx + 7b$ should be grouped as $(2ax - 7a) - (2bx + 7b)$ in preparation for factoring by grouping.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

168. When we talk about “the zeros of a function” we mean:

- (a) The input value(s) for which the output value is zero.
- (b) x -intercepts and y -intercepts
- (c) The output value(s) for which the input value is zero.
- (d) The pieces of a function that have a slope of zero.

169. The graph and table of values for $y = x^3 - 3x^2 - 10x + 24$ are given below. What are the coordinates of the intercepts of the function?

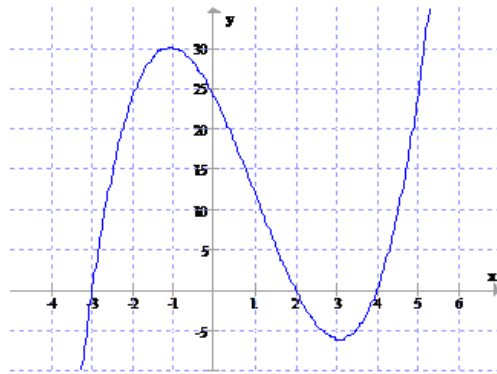


x	y
-3	0
-2	24
-1	30
0	24
1	12
2	0
3	-6
4	0

- (a) $-3, 24, 2, 4$

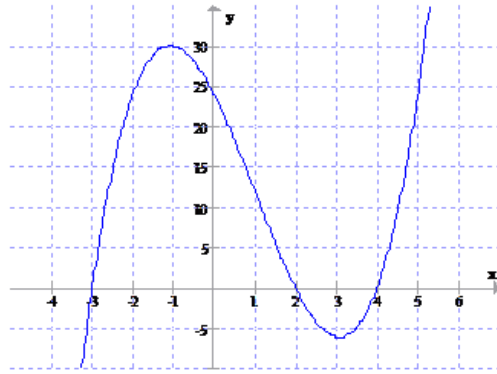
- (b) $(-3, 0), (0, 24), (2, 0), (4, 0)$
- (c) $(-3, 0), (2, 0), (4, 0)$
- (d) $(0, 24)$

170. The graph and table of values for $y = x^3 - 3x^2 - 10x + 24$ are given below. What are the zeros of the function?



x	y
-3	0
-2	24
-1	30
0	24
1	12
2	0
3	-6
4	0

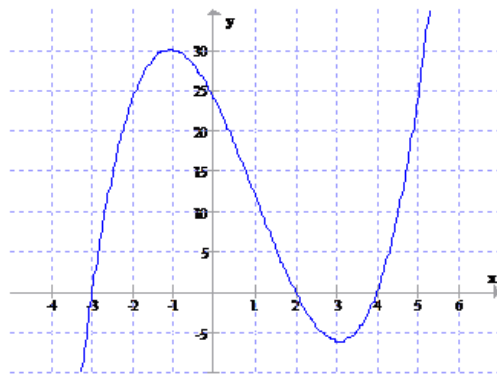
- (a) $-3, 24, 2, 4$
 - (b) $-3, 2, 4$
 - (c) 24
 - (d) $(0, 0)$
171. The graph and table of values for $y = x^3 - 3x^2 - 10x + 24$ are given below. What is a correct factorization of the function?



x	y
-3	0
-2	24
-1	30
0	24
1	12
2	0
3	-6
4	0

- (a) $y = x - 3, x - 24, x - 2, x - 4$
- (b) $x + 3, x - 2, x - 4$
- (c) $y = (x - (-3))(x - 2)(x - 4)$
- (d) $(x + 3)(x - 24)(x - 2)(x - 4)$

172. The graph and table of values for $y = x^3 - 3x^2 - 10x + 24$ are given below. What are the factors of the function?



x	y
-3	0
-2	24
-1	30
0	24
1	12
2	0
3	-6
4	0

- (a) $y = x - 3, x - 24, x - 2, x - 4$
- (b) $x + 3, x - 2, x - 4$
- (c) $y = (x - (-3))(x - 2)(x - 4)$

(d) $(x + 3)(x - 24)(x - 2)(x - 4)$

173. What is the prime factorization of 140?

(a) $(2)(70)$

(b) $(4)(5)(7)$

(c) $(2)(5)(7)$

(d) $(2)(2)(5)(7)$

174. What is the greatest common factor of the terms of $20x^2 + 28x$?

(a) $2x$

(b) $4x^2$

(c) $4x$

(d) $7x$

(e) 1

175. What is the greatest common factor of the terms of $21a^3b - 15a^2b^2$?

(a) $3a^2b$

(b) $105a^3b^2$

(c) $3a^3b^2$

(d) 1

176. Factor out the greatest common factor: $16x^3y^2 - 24x^4y + 32x^2y$

(a) $4xy(4x^2y - 6x^3 + 8x)$

(b) $8x^2y(2xy - 3x^2 + 4)$

(c) $16x^3y^2(1 - 2x + 2y)$

(d) $8xy^2(2x - 3x^2 + 4y)$

177. Factor -1 out of $20 - x^2$

(a) $-1(20 - x^2)$

(b) $-1(x^2 - 20)$

(c) $-1(20 + x^2)$

(d) $-1(-x^2 + 20)$

178. What is the complete factorization of $21x^2 - 18x$?

(a) $(3x + 2x)(7x - 2)$

(b) $x(21x - 18)$

(c) $3x(21x^2 - 18x)$

(d) $3x(7x - 6)$

(e) This expression is already completely factored.

179. What is the complete factorization of $4x(2x - 1) - 3(2x - 1)$?

- (a) $4x - 3(2x - 1)$
- (b) $(4x - 3)(2x - 1)$
- (c) $8x^2 - 10x + 3$
- (d) This expression is already completely factored.

Section 6.2: Factoring Trinomials of the Form $x^2 + bx + c$

180. What two integers c_1 and c_2 have a product of 12 and a sum of -7 ?

- (a) $c_1 = -2$ and $c_2 = -6$
- (b) $c_1 = 3$ and $c_2 = -4$
- (c) Integers not listed here
- (d) There are no such integers.

181. Factor: $x^2 - 7x + 12$

- (a) $(x + 3)(x + 4)$
- (b) $(x - 3)(x - 4)$
- (c) $(x + 6)(x + 2)$
- (d) $(x - 6)(x - 2)$
- (e) This cannot be factored.

182. What two integers c_1 and c_2 have a product of -11 and a sum of 10 ?

- (a) $c_1 = -11$ and $c_2 = -1$
- (b) $c_1 = 11$ and $c_2 = -1$
- (c) Integers not listed here
- (d) There are no such integers.

183. Factor: $x^2 + 10x - 11$

- (a) $(x + 1)(x - 11)$
- (b) $(x + 1)(x + 11)$
- (c) $(x - 1)(x - 11)$
- (d) $(x - 1)(x + 11)$
- (e) This cannot be factored.

184. What two integers c_1 and c_2 have a product of 24 and a sum of -10 ?

- (a) $c_1 = 6$ and $c_2 = 4$
- (b) $c_1 = -12$ and $c_2 = 2$
- (c) Integers not listed here
- (d) There are no such integers.

185. Factor: $x^2 - 10x + 24$

- (a) $(x + 2)(x + 12)$
- (b) $(x - 2)(x - 12)$
- (c) $(x + 6)(x + 4)$
- (d) $(x - 6)(x - 4)$
- (e) This cannot be factored.

186. What two integers c_1 and c_2 have a product of 12 and a sum of -11 ?

- (a) $c_1 = -12$ and $c_2 = 1$
- (b) $c_1 = -12$ and $c_2 = -1$
- (c) Integers not listed here
- (d) There are no such integers.

187. Factor: $x^2 - 11x + 12$

- (a) $(x + 12)(x + 1)$
- (b) $(x + 12)(x - 1)$
- (c) $(x - 12)(x + 1)$
- (d) $(x - 12)(x - 1)$
- (e) This cannot be factored.

188. Factor: $45m^2 - 20$

- (a) $(7m - 5)(7m + 5)$

- (b) $5(9m - 4)(9m + 4)$
- (c) $5(3m - 4)(3m + 4)$
- (d) $5(3m - 2)(3m + 2)$

189. Factor: $64u^3 - 125$

- (a) $(8u - 5)(8n + 25)$
- (b) $(4u - 5)(16u^2 - 20u + 25)$
- (c) $(4u - 5)(4u^2 + 20u - 25)$
- (d) $(4u - 5)(16u^2 + 20u + 25)$

Section 6.5: Factoring by Grouping and a General Strategy for Factoring Polynomials

190. Which of the following is equivalent to $x^2 + x + 0$?

- (a) $x(x)$
- (b) $x(x + 0)$
- (c) $x(x + 1)$
- (d) $2x^2$
- (e) $3x$

191. Factor: $3y^3 - 12y^2 - 2y + 8$

- (a) $(3y^2 - 2)(y - 4)$

- (b) $(y^2 - 4)(3y - 2)$
- (c) $(y^2 - 2)(3y^2 - 4)$
- (d) $(3y^2 - 2)(y + 4)$

Section 6.6 Solving Equations by Factoring

192. If $(x - 2)(x + 1) = 10$, then

- (a) $x - 2 = 10$ or $x + 1 = 10$
- (b) $x = 4$ or $x = -3$
- (c) $x = 2$ or $x = -1$
- (d) $x = 5$ or $x = -2$

193. If $(x - 3)(x + 4) = 18$, then

- (a) $x - 3 = 18$ or $x + 4 = 18$
- (b) $x = 3$ or $x = -4$
- (c) $x = 5$ or $x = -6$
- (d) $x = -3$ or $x = 4$

194. If $(x - 3)(x + 2) = 14$, then

- (a) $x - 3 = 14$ or $x + 2 = 14$
- (b) $x = 3$ or $x = -2$

(c) $x = 5$ or $x = -4$

(d) $x = 4$ or $x = -5$

195. True or False: When solving the equation $(x + 6)(x - 3) = 0$ we can say either $x + 6 = 0$ or $x - 3 = 0$.

(a) True, and I am very confident

(b) True, but I am not very confident

(c) False, but I am not very confident

(d) False, and I am very confident

196. True or False: When solving the equation $(x + 6)(x - 3) = 5$ we can say either $x + 6 = 5$ or $x - 3 = 5$.

(a) True, and I am very confident

(b) True, but I am not very confident

(c) False, but I am not very confident

(d) False, and I am very confident

197. Solve by factoring: $5x^2 - 8x = 2x^2 + 16$

(a) $x = 24$ or $\frac{16}{3}$

(b) $x = 8$ or $\frac{16}{3}$

(c) $x = 4$ or $-\frac{4}{3}$

(d) $x = -4$ or $\frac{4}{3}$

198. Solve $x^3 + 2x^2 - 9x - 18 = 0$.

(a) $x = 18, x = -1 \pm \sqrt{10}$

(b) $x = 3, x = -3, x = -2$

(c) $x = -2$

(d) There is no solution.

Section 7.1: Extraction of Roots and Properties of Square Roots

199. What number(s) squared give(s) 25?

(a) 5

(b) 5 and -5

(c) $\frac{25}{2}$

(d) $\frac{25}{2}$ and $-\frac{25}{2}$

200. Find all solutions to $x^2 = 25$.

(a) $x = 5$

(b) $x = 5$ and $x = -5$

(c) $x = \frac{25}{2}$

(d) $x = \frac{25}{2}$ and $x = -\frac{25}{2}$

201. What is $\sqrt{-25}$?

- (a) -5
- (b) 5
- (c) not a real number

202. What is $-\sqrt{25}$?

- (a) -5
- (b) 5
- (c) not a real number

203. **True or False:** 7 and -7 are both square roots of 49.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

204. **True or False:** $\sqrt{49} = -7$

- (a) True, and I am very confident
- (b) True, but I am not very confident

- (c) False, but I am not very confident
- (d) False, and I am very confident

205. **True or False:** $-\sqrt{64} = -8$

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

206. Simplify: $\sqrt{-9^2}$

- (a) -9
- (b) 9
- (c) not a real number

207. Simplify: $\sqrt{(-9)^2}$

- (a) -9
- (b) 9
- (c) not a real number

208. Simplify: $\sqrt{24}$

- (a) $12\sqrt{2}$
- (b) $4\sqrt{6}$

(c) $8\sqrt{3}$

(d) $2\sqrt{6}$

209. Simplify: $\sqrt{250}$

(a) $5\sqrt{50}$

(b) $5\sqrt{10}$

(c) $10\sqrt{5}$

(d) $2\sqrt{125}$

210. True or False: The solution to $x^2 = 10$ is $x = \sqrt{10}$.

(a) True, and I am very confident

(b) True, but I am not very confident

(c) False, but I am not very confident

(d) False, and I am very confident

211. Find all solutions to $(x - 3)^2 = 25$.

(a) $x = 5$ and $x = -5$

(b) $x = \sqrt{28}$ and $x = -\sqrt{28}$

(c) $x = 8$

(d) $x = 8$ and $x = -2$

212. Find all solutions to $4x^2 = 36$.

- (a) $x = \frac{3}{2}$ and $x = -\frac{3}{2}$
- (b) $x = 6$ and $x = -6$
- (c) $x = 3$ and $x = -3$

213. Find all solutions to $4(x - 2)^2 = 100$.

- (a) $x = 7$ and $x = -3$
- (b) $x = \frac{9}{2}$ and $x = -\frac{1}{2}$
- (c) $x = 18$ and $x = -2$
- (d) $x = 5$ and $x = -5$

214. A home-owner wishes to build an addition. The addition will be a rectangular room with an area of 120 square feet, with the length equal to twice the width. If w is the width of the addition, which equation must be true?

- (a) $3w = 120$
- (b) $w^2 = 120$
- (c) $\frac{1}{2}w^2 = 120$
- (d) $2w^2 = 120$

215. True or False: All quadratic equations have two solutions.

- (a) True, and I am very confident

- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

216. Assuming that the goal is to solve the quadratic equation $x^2 - 6x = 8$ by completing the square, what should be added to both sides of the equation so that the left-hand side becomes a perfect square?

- (a) 3
- (b) -8
- (c) 9
- (d) -9

217. Solve by completing the square: $x^2 + 8x + 25 = 0$

- (a) $x = -5$
- (b) $x = -4 + 3i, -4 - 3i$
- (c) $x = -1, -7$
- (d) $x = -4 + 5i, -4 - 5i$

218. Solve using the quadratic formula: $3y^2 - 5y + 1 = 0$

- (a) $y = 5 + \frac{\sqrt{13}}{6}, 5 - \frac{\sqrt{13}}{6}$

$$(b) y = 5 + \frac{i\sqrt{13}}{6}, 5 - \frac{i\sqrt{13}}{6}$$

$$(c) y = \frac{-5 + \sqrt{13}}{6}, \frac{-5 - \sqrt{13}}{6}$$

$$(d) y = \frac{5 + \sqrt{13}}{6}, \frac{5 - \sqrt{13}}{6}$$

219. Solve: $x^2 + 2x + 13 = 0$.

(a) $-1 \pm 2\sqrt{3}i$

(b) $-1 \pm 4\sqrt{3}i$

(c) $-1 \pm 24i$

(d) There is no solution.

220. Use the discriminant to determine whether $5x^2 + 3x + 1 = 0$ has

(a) 2 real solutions

(b) 1 real solution

(c) 2 complex solutions

221. Use the discriminant to determine whether $16m^2 - 40m + 25 = 0$ has

(a) 2 real solutions

(b) 1 real solution

(c) 2 complex solutions

Section 7.5: Complex Numbers and Solving Quadratic Equations with Complex Solutions

222. True or False: The roots and the x-intercepts of an equation are the same.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

223. True or False: The real zeros and the x-intercepts of a polynomial equation are the same.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

224. Evaluate: $-\sqrt{-100}$

- (a) $-10i$
- (b) -10
- (c) $10i$
- (d) 10

225. Evaluate: $\sqrt{-250}$

- (a) $5i$
- (b) $-5i\sqrt{10}$
- (c) $5i\sqrt{10}$
- (d) $-5\sqrt{10}$

226. Find i^{27} .

- (a) i
- (b) -1
- (c) $-i$
- (d) 1

227. Solve by the Square Root Method: $(2x - 6)^2 + 16 = 0$

- (a) $x = 5, 1$
- (b) $x = 5i, i$
- (c) $x = 3 + 2i, 3 - 2i$
- (d) $x = 3 + 4i, 3 - 4i$

228. Simplify: $\sqrt{-64} - \sqrt{16} + \sqrt{-4} =$

- (a) $14i$
- (b) $6i$
- (c) $-12 + 2i$

(d) $-4 + 10i$

229. Find $(3 + \sqrt{-9}) - (5 + \sqrt{-16})$.

(a) $-2 - \sqrt{-7}$

(b) $-2 + 7i$

(c) $-2 - i$

(d) $-2 + i$

230. Find $(3 + \sqrt{-9})(5 + \sqrt{-16})$.

(a) $27 - 27i$

(b) $27 + 27i$

(c) $3 - 27i$

(d) $3 + 27i$

231. Express in the form $a + bi$, where a and b are real

numbers: $\frac{4 - i}{3 + 2i}$

(a) $\frac{14}{13} - \frac{11}{13}i$

(b) $\frac{10}{13} - \frac{11}{13}i$

(c) $\frac{14}{5} - \frac{11}{5}i$

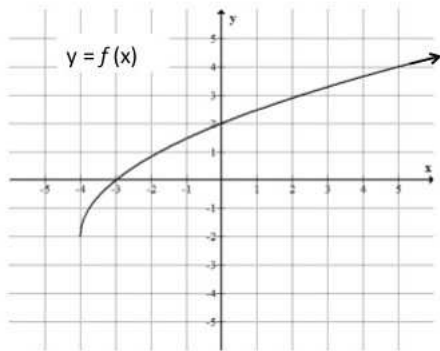
(d) $\frac{10}{5} - \frac{11}{5}i$

Section 8.1 Functions and Representations of Functions

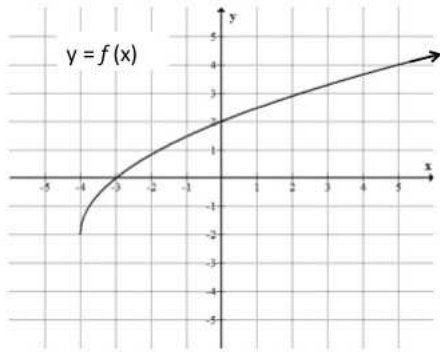
232. True or False: A function is a relationship in which every element of the range corresponds to exactly **one** element of the domain.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

233. What is the value of $f(0)$?



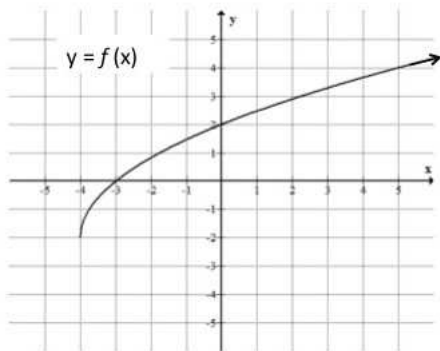
- (a) -3
- (b) 0
- (c) 2
- (d) 3



234. What is the domain of the function?

- (a) $(-\infty, \infty)$
- (b) $[-4, \infty)$
- (c) $[-3, \infty)$
- (d) $[-2, \infty)$

235. What is the range of the function?



- (a) $(-\infty, \infty)$
- (b) $[-4, \infty)$
- (c) $[-3, \infty)$
- (d) $[-2, \infty)$

236. Find the domain of the function $f(x) = \sqrt{x + 3}$.

(a) $(-\infty, \infty)$

(b) $[0, \infty)$

(c) $(-3, \infty)$

(d) $[-3, \infty)$

237. Let $f(x) = \begin{cases} 2x + 5 & \text{if } x \leq -1 \\ x^2 - 1 & \text{if } x > 1 \end{cases}$ What is the value of $f(3) + f(-2)$?

(a) 9

(b) 11

(c) 12

(d) 18

Section 8.2 Linear Functions

238. True or False: The table of data below could represent a linear function.

x	$f(x)$
0	4
2	10
5	19
10	34

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

Section 8.3 Absolute Value Functions

239. What are the domain and range of the function $y = |x|$?
- (a) Domain: $(-\infty, \infty)$; Range: $[0, \infty)$
 - (b) Domain: $(-\infty, \infty)$; Range: $(-\infty, \infty)$
 - (c) Domain: $[0, \infty)$; Range: $(-\infty, \infty)$
 - (d) Domain: $(-\infty, \infty)$; Range: $[0, \infty]$
 - (e) Domain: $[0, \infty)$; Range: $[0, \infty)$
240. The two equations to write when solving the equation $|3x + 5| = 8$ are:
- (a) $3x + 5 = 8$ and $3x - 5 = 8$
 - (b) $3x + 5 = 8$ and $-3x + 5 = 8$
 - (c) $3x + 5 = 8$ and $-3x - 5 = -8$
 - (d) $3x + 5 = 8$ and $-3x - 5 = 8$
 - (e) We do not need to write two equations to solve this problem.

241. Solve $|3 - 4x| > 9$.

(a) $(-\infty, -\frac{3}{2}) \cup (3, \infty)$

(b) $(-\infty, 3) \cup (-\frac{3}{2}, \infty)$

(c) $(-\infty, -\frac{3}{2}) \cup (-\infty, 3)$

(d) $(-\infty, -3)$

Section 8.4 Quadratic Functions

242. True or False: All quadratic functions have domain $(-\infty, \infty)$.

(a) True, and I am very confident

(b) True, but I am not very confident

(c) False, but I am not very confident

(d) False, and I am very confident

243. True or False: All quadratic functions have range $(-\infty, \infty)$.

(a) True, and I am very confident

(b) True, but I am not very confident

- (c) False, but I am not very confident
- (d) False, and I am very confident

244. True or False: All quadratic functions have at least one x -intercept.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

245. True or False: Quadratic functions may have more than one y -intercept.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

246. True or False: The table of data below could represent a quadratic function.

x	$f(x)$
-2	1
0	-3
1	-2
4	13

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

247. True or False: If a linear function and a quadratic function are graphed on the same coordinate axes, there must be at least one point of intersection.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

Section 9.1 Graphs of Rational Functions and Reducing Rational Expressions

248. $\frac{x^2-2x-15}{x+3} =$

- (a) $x - 5$
- (b) $x^2 - 7$
- (c) $x - 7$
- (d) This cannot be simplified.

249. Simplify: $\frac{15x^8 - 5x^6 + 30x^4}{5x^2}$

(a) $10x^4 - x^3 + 25x^2$

(b) $3x^4 - x^3 + 6x^2$

(c) $10x^6 - x^4 + 25x^2$

(d) $3x^6 - x^4 + 6x^2$

250. $\frac{x+5}{x^2+3x-10} =$

(a) $x - 2$

(b) $\frac{1}{x-2}$

(c) $\frac{1}{x^2+1}$

(d) This cannot be simplified.

251. $\frac{x^2+2}{2} =$

(a) x^2

(b) $x^2 + 1$

(c) $\frac{x^2}{2} + 1$

(d) This cannot be simplified.

252. $\frac{x^2+6}{3} =$

(a) $\frac{x^2}{3} + 2$

- (b) $x^2 + 2$
- (c) $x^2 + \frac{1}{2}$
- (d) This cannot be simplified.

253. $\frac{3x^2+6}{3} =$

- (a) $\frac{x^2}{3} + 2$
- (b) $x^2 + 2$
- (c) $3x^2 + 2$
- (d) $x^2 + 6$

254. Let $f(x) = \frac{x - 4}{(x + 6)(x - 3)}$ What is the domain of f ?

- (a) $(-\infty, \infty)$
- (b) $\{4, -6, 3\}$
- (c) $\{-6, -3\}$
- (d) All reals except -6, 3

Section 9.2: Multiplying and Dividing Rational Expressions

255. Compute:

$$\frac{x^2 + 7x + 12}{x^2 + 9x + 18} \div \frac{x^2 + 6x + 8}{x^2 + 15x + 56}$$

- (a) $\frac{(x+6)(x+2)}{(x+7)(x+8)}$
- (b) $\frac{x+6}{(x+2)(x+7)(x+8)}$
- (c) $\frac{(x+7)(x+8)}{(x+6)(x+2)}$
- (d) $\frac{(2x+7)(7x+15)}{3(x+3)(x+6)}$

256. Subtract and simplify: $\frac{x^2 - 4x}{x + 4} - \frac{28 - x}{x + 4} = ?$

- (a) $x - 7$
- (b) $\frac{x^2 - 5x - 28}{x + 4}$
- (c) $x + 7$
- (d) $x(28 - x)$

257. Find the lowest common denominator: $\frac{x}{x^2 - 9} - \frac{3}{x^2 - 5x + 6}$

- (a) $(x - 3)(x - 2)$
- (b) $(x + 3)(x - 2)$
- (c) $(x - 3)(x + 3)(x - 2)$
- (d) $(x - 3)^2(x + 3)(x - 2)$

258. Combine and simplify: $\frac{2}{x + 3} - \frac{2x + 10}{x^2 + 8x + 15} + \frac{x}{x + 5}$

$$(a) \frac{x}{x+5}$$

$$(b) \frac{x+10}{(x+3)(x+5)}$$

$$(c) \frac{x-8}{x+3}$$

$$(d) \frac{-x-8}{(x+3)(x+5)}$$

259. Perform the operations and simplify: $\frac{x}{x-2} - \frac{2}{x+2} + \frac{3}{x^2-4}$

$$(a) \frac{x^2+7}{x^2-4}$$

$$(b) \frac{x^2-1}{x^2-4}$$

$$(c) -\frac{7}{4}$$

$$(d) \frac{x+1}{x^2-8}$$

Section 9.4 Combining Operations and Simplifying Complex Rational Expressions

260. The reciprocal of $\frac{1}{x} + \frac{1}{y}$ is

- (a) $x + y$
- (b) $\frac{x+y}{xy}$
- (c) $\frac{xy}{x+y}$
- (d) $\frac{1}{x+y}$

261. The reciprocal of $\frac{2}{x} + \frac{3}{y}$ is

- (a) $\frac{3x+2y}{xy}$
- (b) $\frac{x+y}{5}$
- (c) $\frac{x}{2} + \frac{y}{3}$
- (d) $\frac{xy}{3x+2y}$

262. The reciprocal of $\frac{1}{4} + \frac{1}{q}$ is

- (a) $\frac{1}{4+q}$
- (b) $\frac{4q}{4+q}$
- (c) $\frac{4+q}{4q}$
- (d) $4 + q$

263. Simplify: $\frac{\left(\frac{5x}{x+7}\right)}{\left(\frac{10}{x^2+8x+7}\right)}$

$$(a) \frac{50x}{x+1}$$

$$(b) \frac{x(x+1)}{2}$$

$$(c) \frac{2x}{(x+7)^2(x+1)}$$

$$(d) \frac{x}{2(x^2+8)}$$

264. Simplify:
$$\frac{\left(4 + \frac{16}{x-4}\right)}{\left(5 + \frac{20}{x-4}\right)}$$

$$(a) \frac{4}{5}$$

$$(b) \frac{5}{4}$$

$$(c) \frac{4x+12}{5x+16}$$

$$(d) \frac{20}{(x-4)^2}$$

265. Simplify: $\frac{\begin{pmatrix} x & y \\ y & x \end{pmatrix}}{\begin{pmatrix} 1 & 1 \\ y & x \end{pmatrix}}$

- (a) $x - y$
- (b) $x + y$
- (c) $x^2 - y^2$
- (d) $x^2 + y^2$

266. Solve for x : $\frac{1}{x+1} + \frac{1}{x-1} = \frac{2}{x^2-1}$

- (a) $x = 1$
- (b) $x = -1$
- (c) $x = 1$ or -1
- (d) no solution

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

- (a) $x = \frac{5}{3}$
- (b) $x = 1$
- (c) All real numbers are solutions.

(d) There is no solution.

268. Solve for a : $\frac{1}{r} = \frac{1}{a} + \frac{1}{b}$

(a) $a = r - b$

(b) $a = \frac{ra + rb}{b}$

(c) $a = \frac{r(a + b)}{b}$

(d) $\frac{rb}{b - r}$

Section 10.1 Evaluating Radical Expressions and Graphing Square Root and Cube Root Functions

269. $\sqrt{4x^2 + 16} =$

(a) $2x + 4$

(b) $|2x + 4|$

(c) $2\sqrt{x^2 + 4}$

(d) This cannot be simplified.

270. $\sqrt{x^2 + 81} =$

(a) $x + 9$

- (b) $|x + 9|$
- (c) $3\sqrt{x^2 + 9}$
- (d) This cannot be simplified.

271. $\sqrt{9x^2 + 81} =$

- (a) $3x + 9$
- (b) $|3x + 9|$
- (c) $3\sqrt{x^2 + 9}$
- (d) This cannot be simplified.

272. $\sqrt{x^2 + 100} =$

- (a) $|x| + 10$
- (b) $|x + 10|$
- (c) $x + 10$
- (d) This cannot be simplified.

273. $\sqrt{4x^2 + 100} =$

- (a) $2x + 10$
- (b) $|2x + 10|$
- (c) $2\sqrt{x^2 + 25}$
- (d) This cannot be simplified.

274. Simplify: $\sqrt[3]{-9^3}$

- (a) -9
- (b) 9
- (c) not a real number

275. Find $\sqrt[3]{-8}$.

- (a) 2
- (b) -2
- (c) $2i$
- (d) The expression does not exist.

276. Simplify: $\sqrt{x^3}$

- (a) $x\sqrt{x}$
- (b) $x\sqrt{x^2}$
- (c) $x^2\sqrt{x}$
- (d) x

277. Assuming $x > 0$, simplify $\sqrt{50x^2}$.

- (a) $5x\sqrt{2x}$
- (b) $5x\sqrt{2}$
- (c) $5\sqrt{2x^2}$

(d) $25x\sqrt{2}$

278. Simplify: $\sqrt{75a^4}$

(a) $5a^2\sqrt{3}$

(b) $3a^2\sqrt{5}$

(c) $25a\sqrt{3a}$

(d) $3a^2\sqrt{25}$

279. Simplify $\sqrt[3]{54x^4}$.

(a) $3x\sqrt[3]{6x^2}$

(b) $27x^3\sqrt[3]{2x}$

(c) $3x\sqrt[3]{2x}$

(d) The expression cannot be simplified.

280. Combine and simplify: $5\sqrt{12} - \sqrt{27}$

(a) $\sqrt{33}$

(b) $17\sqrt{3}$

(c) $-10\sqrt{12}$

(d) $7\sqrt{3}$

281. Simplify: $\frac{21}{\sqrt{7}}$

- (a) 3
- (b) 147
- (c) $3\sqrt{7}$
- (d) $\frac{3\sqrt{7}}{7}$

282. Multiply and simplify: $(5 + \sqrt{3})(5 - \sqrt{3})$

- (a) 28
- (b) 22
- (c) $28 + 10\sqrt{3}$
- (d) $22 - 10\sqrt{3}$

283. What is the conjugate of $8 + \sqrt{10}$?

- (a) $8 + \sqrt{10}$
- (b) $8 - \sqrt{10}$
- (c) 18
- (d) -2

284. What is the product when $8 + \sqrt{10}$ is multiplied by its conjugate?

- (a) -36
- (b) 164

(c) 54

(d) 74

285. Simplify: $\frac{4q}{\sqrt{7} - \sqrt{5}}$

(a) $2q$

(b) $2q(\sqrt{7} - \sqrt{5})$

(c) $\frac{q(\sqrt{7} + \sqrt{5})}{6}$

(d) $2q(\sqrt{7} + \sqrt{5})$

286. Rationalize the denominator: $\frac{1}{\sqrt[3]{x}}$

(a) $\frac{\sqrt[3]{x}}{x^3}$

(b) $\frac{\sqrt[3]{x}}{x}$

(c) $\frac{\sqrt[3]{x^2}}{x}$

(d) The denominator cannot be rationalized.

Section 10.4: Solving Equations Containing Radical Expressions

287. Solve $3\sqrt{x+2} = 12$.

- (a) $x = 14$
- (b) $x = 0$
- (c) $x = 0$ and $x = -4$
- (d) $x = -\frac{2}{3}$

288. Evaluate: $(-27)^{\frac{2}{3}}$

- (a) -9
- (b) 3
- (c) 9
- (d) -18

289. Simplify $16^{-3/2}$.

- (a) -24
- (b) 64
- (c) $\frac{1}{64}$
- (d) $-\frac{1}{64}$

290. Evaluate: $\left(\frac{16}{25}\right)^{-\frac{1}{2}}$

- (a) $\frac{-8}{25}$

(b) $\frac{-4}{5}$

(c) $\frac{4}{5}$

(d) $\frac{5}{4}$

291. Simplify: $\sqrt{160x^2y^5}$

(a) $16|x|y^4\sqrt{10y}$

(b) $4xy^4\sqrt{10y}$

(c) $4|x|y^2\sqrt{10y}$

(d) $10|x|y^2\sqrt{16y}$

292. Simplify $(4x^4)^{3/2}$.

(a) $8x^6$

(b) $4x^6$

(c) $8x^{11/2}$

(d) $4x^{11/2}$

293. The equation $x^{2/5} - x^{1/5} - 2 = 0$ is a quadratic equation in

(a) x

(b) $x^{1/5}$

(c) $x^{2/5}$

(d) The equation cannot be viewed as a quadratic in any variable.

294. Solve $x^{2/5} - x^{1/5} - 2 = 0$.

(a) $x = 32$

(b) $x = -1$

(c) $x = 32, x = -1$

(d) There is no solution.

295. Describe how to obtain the graph of $g(x) = 2^x - 3$ from the graph of $f(x) = 2^x$.

(a) Shift the graph of $f(x)$ up 3.

(b) Shift the graph of $f(x)$ down 3.

(c) Shift the graph of $f(x)$ to the right 3.

(d) Shift the graph of $f(x)$ to the left 3.

296. The graph of which function below is the graph of $f(x) = 2^x$ shifted to the right 3?

(a) $g(x) = 2^x + 3$

(b) $g(x) = 2^x - 3$

(c) $g(x) = 2^{x+3}$

(d) $g(x) = 2^{x-3}$

297. Carmen deposited \$1000 into an investment that returns 8% per year compounded quarterly. Which expression gives the amount of money the investment will be worth after 5 years?

(a) $\$1000(1.02)^{20}$

(b) $\$1000(1.04)^{20}$

(c) $\$1000(1.08)^{20}$

(d) $\$1000e^{20}$

298. What are the domain and range of $f(x) = \log_2 x$?

(a) Domain: $(-\infty, \infty)$; Range: $(0, \infty)$

(b) Domain: $(0, \infty)$; Range: $(-\infty, \infty)$

(c) Domain: $(1, \infty)$; Range: $(-\infty, \infty)$

(d) Domain: $(-\infty, \infty)$; Range: $(-\infty, \infty)$

299. For $x > 1$, where is the graph of $f(x) = \ln x$?

(a) Below the graph of $g(x) = \log_2 x$.

(b) Between the graphs of $g(x) = \log_2 x$ and $h(x) = \log_3 x$.

(c) Above the graph of $h(x) = \log_3 x$.

(d) The graph of f does not exist for $x > 1$.

300. Solve: $2^x = 5$.

(a) $x = \sqrt{5}$

(b) $x = \frac{\ln 5}{\ln 2}$

(c) $x = \ln \frac{5}{2}$

(d) $x = \frac{5}{2}$

301. Solve: $3^{x-2} = 5^{4x}$.

(a) $x = \frac{2 \log 3}{\log 3 - 4 \log 5}$

(b) $x = \frac{2 \log 3}{1 - 4 \log 5}$

(c) $x = -\frac{2}{3}$

(d) $x = \log 1875$