

I Linear Equations and Lines

1 Variables, Expressions, and Equations

1.1 Variables and Evaluating Expressions

1.1.6 Exercises

1. Answer 1. $d, D, x,$ or y

Answer 2. feet or meters

Answer 3. $w, W, x,$ or y

Answer 4. pounds or kilograms

2.

Evaluating Expressions

3. -10

6.

9. 54

12.

15. Answer 1. 8

Answer 2. -27

18.

19. -120

21. $\frac{33}{20}$

23. -24

25. $-\frac{1}{30}$

27. $\frac{2}{9}$

29. 9

31. -13

33. -2744

35. 100

37. 2

39. -35

41. 16

43. -64

45. $\frac{9}{5}$

47. 10

4.

7. 14

10.

13. Answer 1. -25

Answer 2. -16

16.

5. 3

8.

11. Answer 1. 36

Answer 2. 49

14.

17. Answer 1. 20

Answer 2. 100

20.

22.

24.

26.

28.

30.

32.

34.

36.

38.

40.

42.

44.

46.

48.

17. Answer 1. $4.5t, 4.9t$ 18.
 Answer 2. $0.7s^2, 2.4t, -8.1x$
 Answer 3. $7.4t, 5.1y, 5.1s, -5x^2$
 Answer 4. $-6.5z$
19. Answer 1. $3.2t, 7.7, -6.3y^2$ 20.
 Answer 2. $9t, 8.9s, 8.6s, 7.5$
 Answer 3. $2.3z^2, 7t, -1.6s$
 Answer 4. $-7.5t^2, -6.1t^2$
21. Answer 1. $-6t$ 22.
 Answer 2. $11z$
 Answer 3. $3z$
 Answer 4. $3x^2 + 9y^2$
23. Answer 1. $-z$ 24.
 Answer 2. $3x - 9x^2$
 Answer 3. $-6s$
 Answer 4. $4z + 7z^2 - 7s^2$
25. Answer 1. $-8z - 21s^2$ 26.
 Answer 2. $121s + 94s^2$
 Answer 3. $-101z$
 Answer 4. $44 - 122y$
27. Answer 1. $-1.1z + 4.6z^2$ 28.
 Answer 2. $6.5x + 3.9x^2$
 Answer 3. $3.3z^2$
 Answer 4. $0.1z$
29. Answer 1. $\frac{69}{7}z$ 30.
 Answer 2. $\frac{7}{3}y + -\frac{1}{2}y^2$
 Answer 3. $\frac{2}{7}x + \frac{7}{10}x^2 + \frac{3}{7}t^2$
 Answer 4. $\frac{43}{8}y$
31. Answer 1. $\frac{64}{15}z$ 32.
 Answer 2. $\frac{8}{5}z - \frac{8}{3}x^2 + \frac{3}{2}z^2$
 Answer 3. $-x - s + \frac{7}{2}t$
 Answer 4. $\frac{5}{9}z - 6t$

1.3 Comparison Symbols and Notation for Intervals

1.3.4 Exercises

Review and Warmup

1. $\frac{13}{20}$ 2.
 3. $8\frac{17}{20}$ 4.
 5. $\frac{27}{250}$ 6.

7. Answer 1. 0.8
 Answer 2. 0.875
 8.
 9. Answer 1. 3.3125
 Answer 2. 1.55
 10.

Ordering Numbers

11. $7 > 5 > -1 > -5 > -10$
 12.
 13. $9.02 > -3.9 > -4.17 > -4.71 > -4.81$
 14.
 15. $5 > 3 > \frac{-33}{7} > -7 > \frac{-39}{5}$
 16.
 17. $9 > \pi > \frac{\pi}{2} > \frac{2}{3} > \frac{1}{3} > -2$
 18.

True/False

19. Answer 1. False
 Answer 2. False
 Answer 3. False
 Answer 4. True
 Answer 5. True
 Answer 6. True
 20.
 21. Answer 1. False
 Answer 2. False
 Answer 3. False
 Answer 4. True
 Answer 5. False
 Answer 6. False
 22.

Comparisons

23. $>$
 24.
 25. $>$
 26.
 27. $>$
 28.
 29. $<$
 30.
 31. $<$
 32.
 33. $=$
 34.

Set-builder and Interval Notation

35. Answer 1. $\{x \mid x < 2\}$
 Answer 2. $(-\infty, 2)$
 Answer 3. $\{x \mid x \geq -3\}$
 Answer 4. $[-3, \infty)$
 Answer 5. $\{x \mid x \leq 4\}$
 Answer 6. $(-\infty, 4]$
 36.
 37. Answer 1. $\{a \mid a > 1\}$
 Answer 2. $(1, \infty)$
 38.
 39. Answer 1. $\{t \mid t < 3\}$
 Answer 2. $(-\infty, 3)$
 40.
 41. Answer 1. $\{A \mid A \geq -4\}$
 Answer 2. $[-4, \infty)$
 42.

43. Answer 1. $\{n \mid n \leq -2\}$ 44.
 Answer 2. $(-\infty, -2]$

Convert to Interval Notation

- | | | | |
|-----------------------------|-----|-------------------------------|-----|
| 45. $(-\infty, -7]$ | 46. | 47. $[5, \infty)$ | 48. |
| 49. $(-\infty, 9)$ | 50. | 51. $(-7, \infty)$ | 52. |
| 53. $(-\infty, -3)$ | 54. | 55. $(-\infty, 2]$ | 56. |
| 57. $[7, \infty)$ | 58. | 59. $(-10, \infty)$ | 60. |
| 61. $(\frac{3}{7}, \infty)$ | 62. | 63. $(-\infty, -\frac{5}{3}]$ | 64. |
| 65. $(-\infty, 0]$ | 66. | | |

1.4 Equations and Inequalities as True/False Statements**1.4.4 Exercises****Review and Warmup**

- | | |
|--------|-----|
| 1. 6 | 2. |
| 3. -27 | 4. |
| 5. -35 | 6. |
| 7. 0 | 8. |
| 9. -64 | 10. |

Identifying Linear Equations and Inequalities

- | | |
|----------------------|-----|
| 11. Answer 1. is | 12. |
| Answer 2. is not | |
| Answer 3. is not | |
| Answer 4. is not | |
| Answer 5. is | |
| Answer 6. is | |
| 13. Answer 1. is | 14. |
| Answer 2. is | |
| Answer 3. is not | |
| Answer 4. is not | |
| Answer 5. is not | |
| Answer 6. is | |
| 15. Answer 1. is not | 16. |
| Answer 2. is | |
| Answer 3. is not | |
| 17. Answer 1. is | 18. |
| Answer 2. is not | |
| Answer 3. is | |

Checking a Solution for an Equation

- | | |
|---------|-----|
| 19. No | 20. |
| 21. Yes | 22. |

- | | |
|---------|-----|
| 23. Yes | 24. |
| 25. No | 26. |
| 27. No | 28. |
| 29. No | 30. |
| 31. No | 32. |
| 33. No | 34. |
| 35. No | 36. |

Checking a Solution for an Inequality

- | | |
|----------------------|-----|
| 37. Answer 1. is not | 38. |
| Answer 2. is | |
| Answer 3. is | |
| Answer 4. is not | |
| 39. Answer 1. is not | 40. |
| Answer 2. is not | |
| Answer 3. is | |
| Answer 4. is | |
| 41. Answer 1. is | 42. |
| Answer 2. is not | |
| Answer 3. is | |
| Answer 4. is | |

Checking Solutions for Application Problems

- | | |
|---------|-----|
| 43. Yes | 44. |
| 45. No | 46. |
| 47. No | 48. |
| 49. No | 50. |
| 51. No | 52. |
| 53. No | 54. |
| 55. Yes | 56. |

1.5 Solving One-Step Equations**1.5.6 Exercises****Review and Warmup**

- | | | | |
|--------------------|----|-------------------|----|
| 1. Answer 1. -11 | 2. | 3. Answer 1. -7 | 4. |
| Answer 2. -10 | | Answer 2. 7 | |
| Answer 3. -9 | | Answer 3. 0 | |
| 5. Answer 1. -5 | 6. | 7. Answer 1. 9 | 8. |
| Answer 2. 4 | | Answer 2. -7 | |
| Answer 3. 0 | | Answer 3. -8 | |

9. Answer 1. 6
 Answer 2. 8
 Answer 3. 10

10.

11. Answer 1. 8
 Answer 2. -7
 Answer 3. -1
 Answer 4. 1
 Answer 5. undefined
 Answer 6. 0

12.

Solving One-Step Equations with Addition/Subtraction13. $\{10\}$

14.

15. $\{-4\}$

16.

17. $\{-5\}$

18.

19. $\{-3\}$

20.

21. $\{-79\}$

22.

23. $\{2\}$

24.

25. $\{59\}$

26.

27. $\{-3\}$

28.

29. $\{4\}$

30.

31. $\{-8\}$

32.

33. $\{-9\}$

34.

35. $\{1\}$

36.

37. $\{-1/3\}$

38.

39. $\{2\}$

40.

41. $\{1/2\}$

42.

43. $\{-53/40\}$

44.

Solving One-Step Equations with Multiplication/Division45. $\{6\}$

46.

47. $\{-12\}$

48.

49. $\{0\}$

50.

51. $\{48\}$

52.

53. $\{-45\}$

54.

55. $\{24\}$

56.

57. $\{9/2\}$

58.

59. $\{-80/3\}$

60.

61. $\{-7/2\}$

62.

63. $\{8/5\}$

64.

65. $\{28\}$

66.

67. $\{-12\}$

68.

69. $\{20\}$

70.

71. $\{-10/21\}$

72.

73. $\{45\}$

74.

75. $\{45\}$

76.

Comparisons77. Answer 1. $\{6\}$

78.

79. Answer 1. $\{-4\}$ Answer 2. $\{30\}$ Answer 2. $\{25\}$

80.

81. Answer 1. $\{-6\}$

82.

Answer 2. $\{6\}$ 83. Answer 1. $\{-14\}$

84.

85. Answer 1. $\{-21\}$ Answer 2. $\{14\}$ Answer 2. $\{21\}$

86.

87. Answer 1. $\{3\}$

88.

Answer 2. $\{(16/9)\}$ 89. Answer 1. $\{-5\}$

90.

Answer 2. $\{-16/7\}$ **Challenge**91. $x + 1 = 6$

92.

1.6 Solving One-Step Inequalities

1.6 Exercises

Review and Warmup

1. Answer 1. -12

Answer 2. -13

Answer 3. -11

4.

7. Answer 1. 3

Answer 2. -7

Answer 3. -5

10.

2.

5. Answer 1. -1

Answer 2. 5

Answer 3. 0

8.

11. Answer 1. 5

Answer 2. -9

Answer 3. -1

Answer 4. 1

Answer 5. undefined

Answer 6. 0

3. Answer 1. -4

Answer 2. 8

Answer 3. 0

6.

9. Answer 1. 9

Answer 2. 12

Answer 3. 15

12.

Solving One-Step Inequalities using Addition/Subtraction

13. Answer 1. $\{x \mid x > 1\}$ or $\{x \mid 1 < x\}$

Answer 2. $(1, \infty)$

17. Answer 1. $\{x \mid x \geq -7\}$ or $\{x \mid -7 \leq x\}$

Answer 2. $[-7, \infty)$

14.

18.

15. Answer 1. $\{x \mid x \leq 8\}$ or $\{x \mid 8 \geq x\}$

Answer 2. $(-\infty, 8]$

19. Answer 1. $\{x \mid x < 13\}$ or $\{x \mid 13 > x\}$

Answer 2. $(-\infty, 13)$

16.

20.

Solving One-Step Inequalities using Multiplication/Division

21. Answer 1. $\{x \mid x \leq 2\}$ or $\{x \mid 2 \geq x\}$

Answer 2. $(-\infty, 2]$

25. Answer 1. $\{x \mid x \leq -4\}$ or $\{x \mid -4 \geq x\}$

Answer 2. $(-\infty, -4]$

29. Answer 1. $\{x \mid x < -7\}$ or $\{x \mid -7 > x\}$

Answer 2. $(-\infty, -7)$

33. Answer 1. $\{x \mid x > 6\}$ or $\{x \mid 6 < x\}$

Answer 2. $(6, \infty)$

37. Answer 1. $\{x \mid x > -14\}$ or $\{x \mid -14 < x\}$

Answer 2. $(-14, \infty)$

22.

26.

30.

34.

38.

23. Answer 1. $\{x \mid x > \frac{10}{7}\}$

Answer 2. $(\frac{10}{7}, \infty)$

27. Answer 1. $\{x \mid x \geq -2\}$ or $\{x \mid -2 \leq x\}$

Answer 2. $[-2, \infty)$

31. Answer 1. $\{x \mid x \geq -9\}$ or $\{x \mid -9 \leq x\}$

Answer 2. $[-9, \infty)$

35. Answer 1. $\{x \mid x \geq -10\}$ or $\{x \mid -10 \leq x\}$

Answer 2. $[-10, \infty)$

39. Answer 1. $\{x \mid x < 14\}$ or $\{x \mid 14 > x\}$

Answer 2. $(-\infty, 14)$

24.

28.

32.

36.

40.

41. Answer 1. $\{x \mid x > -3\}$ or $\{x \mid -3 < x\}$

Answer 2. $(-3, \infty)$

45. Answer 1. $\{x \mid x \leq 10\}$

Answer 2. $(-\infty, 10]$

42.

46.

43. Answer 1. $\{x \mid x < 3\}$ or $\{x \mid 3 > x\}$

Answer 2. $(-\infty, 3)$

47. Answer 1. $\{z \mid z > 15\}$

Answer 2. $(15, \infty)$

44.

48.

Challenge

49. Answer 1. $<$

Answer 2. $>$

Answer 3. $<$

Answer 4. $>$

1.7 Algebraic Properties and Simplifying Expressions

1.7.7 Exercises

Review and Warmup

1. Answer 1. 2

Answer 2. 2

Answer 3. 4

Answer 4. 4

2.

3. Answer 1. $-2.9t, -5x, 5.7y$

Answer 2. $-7.7z, 0.6s$

Answer 3.

$6.9y, 4.5z, -8.5, 1.6t$

Answer 4. $5.1z, -6y$

6.

4.

5. Answer 1.

$0.3t, -6.7s^2, 1.7t, 7.9t^2$

Answer 2. $-0.9x, -5.7x^2, 6.5$

Answer 3. $5.5y^2, 6.7z^2$

Answer 4. $0.6t^2, -7.2s, -5s^2$

8.

7. Answer 1. $-9 - 2s + 4t$

Answer 2. $7x + t$

Answer 3. $-7 - 6s$

Answer 4. $-6x$

9. 7

12.

15. $(7 + 13) + n$

18.

21. $11 + 4t$

24.

27. $14 + r \cdot 7$

30.

33. $-10n + 80$

36.

39. $56q + 39$

42.

45. $-9r - \frac{54}{7}$

10.

13. $(x + 51) + m$

16.

19. $92 + a$

22.

25. $q \cdot 84$

28.

31. $4m + 24$

34.

37. $45t + 88$

40.

43. $6q + 12$

46.

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

14.

17. $(7 \cdot 5) x$

20.

23. $10(53 + m)$

26.

29. $(b + 45) \cdot 5$

32.

35. $-x + 3$

38.

41. $-5m + 5$

44.

47. $\frac{9}{40}b - \frac{27}{10}$

48.

49. Answer 1. $(c + m) + r$

50.

Answer 2. $c + (m + r)$

51. Answer 1. distributive property

Answer 2. commutative property of addition

Answer 3. associative property of addition

Answer 4. distributive property

Answer 5. commutative property of addition

52.

53. $T = 0.75x + 7.7$

54.

55. $-2x + 2$

56.

57. $-6x - 10$

58.

59. $6x + 3$

60.

61. $-8x + 103$

62.

63. $47x + 7$

64.

65. $-12x + 28$

66.

67. $9x - 25$

68.

1.8 Modeling with Equations and Inequalities

1.8.6 Exercises

Review and Warmup

1. Answer 1. a, A, x , years, or z Answer 2. ft^2 Answer 3. a, A, x , years, or z

Answer 4. years

Answer 5. t, T, x , years, or z

Answer 6. hours

2.

Modeling with Linear Equations

3. $s + 0.013s = 38494$

4.

5. $p + 0.063p = 180.71$

6.

7. $p - 0.25p = 172.5$

8.

9. $b + 0.1b = 110$

10.

11. $p + 0.005p = 904.5$

12.

13. $41h = 123$

14.

15. $0.89m + 31.9 = 182.31$

16.

17. $24 \cdot 12h = 5184$

18.

19. $\frac{0.75}{30} = \frac{1}{50}$

20.

21. $\frac{2832}{2400} = \frac{t}{1600}$

22.

Modeling with Linear Inequalities

- | | |
|------------------------------|-----|
| 23. $8.3454g + 74 \leq 1800$ | 24. |
| 25. $6.8 - 0.8t \leq 0.56$ | 26. |
| 27. $100 + 9m \leq 334$ | 28. |
| 29. $33 \leq 9\pi h$ | 30. |

Translating English Phrases into Math Expressions and Equations

- | | | |
|--|---------------------------------------|-------------------------|
| 31. $b + 5$ | 32. | 33. $B + 8$ |
| 34. | 35. $1 - n$ | 36. |
| 37. $x - 4$ | 38. | 39. $7 - t$ |
| 40. | 41. $c - 10$ | 42. |
| 43. $4C - 5$ | 44. | 45. $4p - 6$ |
| 46. | 47. $\frac{3}{y} - 9$ | 48. |
| 49. $3b = 24$ | 50. | 51. $40 + B = 56$ |
| 52. | 53. $\frac{n}{3} = \frac{13}{3}$ | 54. |
| 55. $\frac{3}{x} = \frac{1}{8}$ | 56. | 57. $4t + 10 = 194$ |
| 58. | 59. $6c - 2 = 64$ | 60. |
| 61. $8C + 8 = 344$ | 62. | 63. $3(p + 7) = 69$ |
| 64. | 65. $\frac{1}{7}y$ | 66. |
| 67. $\frac{27}{42}a$ | 68. | 69. $B - \frac{2}{12}B$ |
| 70. | 71. $n - \frac{2}{3} = \frac{3}{11}n$ | 72. |
| 73. $\frac{3}{11}x - 1 = \frac{2}{9}x$ | 74. | |

Challenge

75. \$10.75

1.9 Variables, Expressions, and Equations Chapter Review**1.9.9 Exercises****Variables and Evaluating Expressions**

- | | |
|------------------|-----|
| 1. Answer 1. 64 | 2. |
| Answer 2. 9 | |
| 3. $\frac{1}{3}$ | 4. |
| 5. -1 | 6. |
| 7. -15 degC | 8. |
| 9. 25% | 10. |

Combining Like Terms

- | | |
|-----------------|-----|
| 11. Answer 1. 3 | 12. |
| Answer 2. 2 | |
| Answer 3. 2 | |
| Answer 4. 4 | |

13. Answer 1. $-6.9t, -1.1x, 3.4x^2$ 14.

Answer 2. $0.7s^2, 5.3y^2, -1.5$

Answer 3. $-3.4x^2, -2.1t$

Answer 4. $-7.9s, -8.6t^2$

15. Answer 1. $-\frac{3}{7} + -\frac{1}{2}t + -\frac{11}{2}t^2$ 16.

Answer 2. $\frac{1}{6}s + 9z^2 - \frac{11}{6}s^2$

Answer 3. $\frac{5}{8}z - 2t$

Answer 4. $\frac{6}{7} - \frac{17}{7}y^2$

Comparison Symbols and Notation for Intervals

17. Answer 1. False 18.

Answer 2. False

Answer 3. False

Answer 4. True

Answer 5. True

Answer 6. False

19. $>$

20.

21. Answer 1. $\{x \mid x \leq 3\}$

Answer 2. $(-\infty, 3]$

Answer 3. $\{x \mid x \geq -4\}$

Answer 4. $[-4, \infty)$

Answer 5. $\{x \mid x < 1\}$

Answer 6. $(-\infty, 1)$

22.

23. $(-\infty, 6]$

24.

Equations and Inequalities as True/False Statements

25. Yes

26.

27. No

28.

29. No

30.

Solving One-Step Equations

31. $\{8\}$

34.

37. Answer 1. $\{8\}$

Answer 2. $\{14\}$

32.

35. $\{45\}$

38.

33. $\{(-83/56)\}$

36.

39. Answer 1. $\{-6\}$

Answer 2. $\{63\}$

40.

41. Answer 1. $\{-21\}$

42.

Answer 2. $\{21\}$ **Solving One-Step Inequalities**

43. Answer 1.

$\{x \mid x < 11\}$ or $\{x \mid 11 > x\}$

Answer 2. $(-\infty, 11)$

46.

44.

47. Answer 1.

$\{x \mid x \leq -4\}$ or $\{x \mid -4 \geq x\}$

Answer 2. $(-\infty, -4]$

50.

45. Answer 1.

$\{x \mid x \leq 3\}$ or $\{x \mid 3 \geq x\}$

Answer 2. $(-\infty, 3]$

48.

49. Answer 1.

$\{x \mid x > 2\}$ or $\{x \mid 2 < x\}$

Answer 2. $(2, \infty)$

52.

51. Answer 1.

$\{x \mid x \geq -5\}$ or $\{x \mid -5 \leq x\}$

Answer 2. $[-5, \infty)$ **Algebraic Properties and Simplifying Expressions**

53. 8

54.

55. $-\frac{1}{4}$

56.

57. $(a + 19) + y$

58.

59. $(7 \cdot 5)m$

60.

61. $91 + 4q$

62.

63. $r \cdot 21$

64.

65. $6c + 60$

66.

67. $49n + 71$

68.

69. $50p^3 - 32p$

70.

71. $26x + 28$

72.

Modeling with Equations and Inequalities

73. $p + 0.072p = 139.36$

74.

75. $p - 0.05p = 180.5$

76.

77. $53h = 106$

78.

79. $8q - 7$

81. $\frac{z}{r} + 10$

83. $3b - 1 = 68$

85. $5(C + 3) = 125$

87. $p + \frac{3}{4} = \frac{3}{10}p$

80.

82.

84.

86.

88.

2 Linear Equations and Inequalities

2.1 Solving Multistep Linear Equations

2.1.6 Exercises

Warmup and Review

- | | | | |
|-------------|----|-------------------|----|
| 1. $\{-3\}$ | 2. | 3. $\{8\}$ | 4. |
| 5. $\{-7\}$ | 6. | 7. $\{\{12/5\}\}$ | 8. |

Solving Two-Step Equations

- | | | | |
|--------------|-----|---------------|-----|
| 9. $\{3\}$ | 10. | 11. $\{-10\}$ | 12. |
| 13. $\{-3\}$ | 14. | 15. $\{4\}$ | 16. |
| 17. $\{-6\}$ | 18. | 19. $\{-3\}$ | 20. |
| 21. $\{-7\}$ | 22. | 23. $\{-10\}$ | 24. |

Application Problems for Solving Two-Step Equations

25. 19
26.
27. 440
28.
29. 39
30.

Solving Equations with Variable Terms on Both Sides

- | | | |
|-------------------|--------------|--|
| 31. $\{6\}$ | 32. | 33. $\{10\}$ |
| 34. | 35. $\{-7\}$ | 36. |
| 37. $\{\{2/3\}\}$ | 38. | 39. Answer 1. $\{4\}$
Answer 2. $\{3\}$ |
| 40. | | |

Application Problems for Solving Equations with Variable Terms on Both Sides

41. 11
42.
43. 92
44.

45. 10

46.

Solving Linear Equations with Like Terms

47. {2}

48.

49. {6}

50.

51. {-9}

52.

53. {-7}

54.

55. {7}

56.

57. {-5}

58.

59. {5}

60.

61. {0}

62.

63. {-6}

64.

65. {-1}

66.

67. {0}

68.

69. {-7}

70.

Application Problems for Solving Linear Equations with Like Terms71. **Answer 1.** 60 m**Answer 2.** 70 m

72.

73. 157

74.

75. **Answer 1.** \$610**Answer 2.** \$115

76.

77. 900

78.

Solving Linear Equations Involving Distribution

79. {5}

80.

81. {-6}

82.

83. {-9}

84.

85. {5}

86.

87. {-1}

88.

89. {1}

90.

91. {7}

92.

93. {3}

94.

95. {5}

96.

97. {-6}

98.

99. {3}

100.

101. {-9}

102.

103. {1}

104.

105. {10}

106.

107. **Answer 1.** {-10}

108.

Answer 2. {0}

109. {-1}

110.

6.

7. Answer 1.

$$\{x \mid x \geq -3\} \text{ or } \{x \mid -3 \leq x\}$$

Answer 2.

$$[-3, \infty)$$

8.

9. Answer 1.

$$\{x \mid x > 14\} \text{ or } \{x \mid 14 < x\}$$

Answer 2.

$$(14, \infty)$$

10.

11. $70 + 10m = 230$

12.

Solving Multistep Linear Inequalities

13. Answer 1.

$$\{x \mid x > 3\} \text{ or } \{x \mid 3 < x\}$$

Answer 2. $(3, \infty)$

16.

19. Answer 1.

$$\{x \mid x > 7\} \text{ or } \{x \mid 7 < x\}$$

Answer 2. $(7, \infty)$

22.

25. Answer 1.

$$\{x \mid x \geq 2\} \text{ or } \{x \mid 2 \leq x\}$$

Answer 2. $[2, \infty)$

28.

31. Answer 1. $\{a \mid a > 6\} \text{ or } \{a \mid 6 < a\}$ Answer 2. $(6, \infty)$ 33. Answer 1. $\{p \mid p \leq 0\} \text{ or } \{p \mid 0 \geq p\}$ Answer 2. $(-\infty, 0]$ 35. Answer 1. $\{p \mid p < -4\} \text{ or } \{p \mid -4 > p\}$ Answer 2. $(-\infty, -4)$ 37. Answer 1. $\{x \mid x \leq -6\} \text{ or } \{x \mid -6 \geq x\}$ Answer 2. $(-\infty, -6]$ 39. Answer 1. $\{z \mid z \leq 10\} \text{ or } \{z \mid 10 \geq z\}$ Answer 2. $(-\infty, 10]$ 41. Answer 1. $\{y \mid y > 6\} \text{ or } \{y \mid 6 < y\}$ Answer 2. $(6, \infty)$ 43. Answer 1. $\{x \mid x < 5\} \text{ or } \{x \mid 5 > x\}$ Answer 2. $(-\infty, 5)$

14.

17. Answer 1.

$$\{x \mid x \leq -9\} \text{ or } \{x \mid -9 \geq x\}$$

Answer 2. $(-\infty, -9]$

20.

23. Answer 1.

$$\{x \mid x > 9\} \text{ or } \{x \mid 9 < x\}$$

Answer 2. $(9, \infty)$

26.

29. Answer 1.

$$\{z \mid z \geq 9\} \text{ or } \{z \mid 9 \leq z\}$$

Answer 2. $[9, \infty)$

15. Answer 1.

$$\{x \mid x \leq 10\} \text{ or } \{x \mid 10 \geq x\}$$

Answer 2. $(-\infty, 10]$

18.

21. Answer 1.

$$\{x \mid x \geq 0\} \text{ or } \{x \mid 0 \leq x\}$$

Answer 2. $[0, \infty)$

24.

27. Answer 1.

$$\{t \mid t < 3\} \text{ or } \{t \mid 3 \geq t\}$$

Answer 2. $(-\infty, 3)$

30.

32.

34.

36.

38.

40.

42.

44.

Applications

45. **Answer 1.** $25 + 2.6x \leq 155$

Answer 2. 50 miles

Answer 3. $[0, 50]$

46.

47. **Answer 1.** 106.25

Answer 2. $(106.25, \infty)$

48.

49. **Answer 1.** \$6,000.00

Answer 2. $(6000, \infty)$

50.

2.3 Linear Equations and Inequalities with Fractions

2.3.6 Exercises

Review and Warmup

1. $\frac{8}{3}$

4.

2.

5. **Answer 1.** 20

Answer 2. 25

Answer 3. 30

3. -30

6.

Solving Linear Equations with Fractions

7. $\{50\}$

10.

13. $\{9\}$

16.

19. $\{16\}$

22.

25. $\{-5\}$

28.

31. $\{5\}$

34.

37. $\{40\}$

40.

43. $\{(-24/7)\}$

46.

49. $\{9\}$

52.

55. $\{(77/4)\}$

58.

61. $\{6\}$

64.

8.

11. $\{30\}$

14.

17. $\{18\}$

20.

23. $\{(-3/28)\}$

26.

29. $\{(2/7)\}$

32.

35. $\{18\}$

38.

41. $\{(-64/245)\}$

44.

47. $\{-50\}$

50.

53. $\{42\}$

56.

59. $\{3\}$

62.

65. $\{(-1/3)\}$

9. $\{16\}$

12.

15. $\{12\}$

18.

21. $\{(7/19)\}$

24.

27. $\{-10\}$

30.

33. $\{(-63/10)\}$

36.

39. $\{(-3/194)\}$

42.

45. $\{28\}$

48.

51. $\{(-27/56)\}$

54.

57. $\{22\}$

60.

63. $\{60\}$

66.

67. $\{-72/77\}$

70.

73. $\{-14/85\}$

75. Answer 1. $\{25\}$

Answer 2. $\{25\}$

Answer 3. $\{25\}$

Answer 4. $\{-25\}$

68.

71. $\{-32/51\}$

69. $\{90\}$

72.

74.

76.

Applications

77. 32

78.

79. 20

80.

81. 68

82.

83. \$324

84.

85. \$1,650.32

86.

87. 179.55 mi

88.

89. \$9.24

90.

91. 2241

92.

93. \$2,054.00

94.

95. 182

96.

97. 1705.2 lb

98.

Solving Inequalities with Fractions

99. Answer 1. $\{x \mid x \leq 18\}$ or $\{x \mid 18 \geq x\}$ 100.

Answer 2. $(-\infty, 18]$

103. Answer 1. $\{t \mid t < 60\}$ 104.

Answer 2. $(-\infty, 60)$

107. Answer 1. $\{z \mid z > 12\}$ 108.

Answer 2. $(12, \infty)$

101. Answer 1. $\{y \mid y > -\frac{7}{8}\}$ 102.

Answer 2. $(-\frac{7}{8}, \infty)$

105. Answer 1. $\{x \mid x \leq 36\}$ 106.

Answer 2. $(-\infty, 36]$

109. Answer 1. $\{x \mid x \geq -21\}$ 110.

Answer 2. $[-21, \infty)$

111. Answer 1. 112.

$$\{y \mid y \leq -19\}$$

Answer 2.

$$(-\infty, -19]$$

113. Answer 1. $\{x \mid x > 3\}$

114.

Answer 2. $(3, \infty)$

Applications

115. Answer 1. $\frac{162+x}{3} \geq 82$

Answer 2. 84

Answer 3. $[84, 100]$

116.

Challenge

117. 14

2.4 Special Solution Sets

2.4.4 Exercises

Review and Warmup

1. $\{2\}$

2.

3. $\{7\}$

4.

5. $\{2\}$

6.

7. $\{2\}$

8.

Solving Equations with Special Solution Sets

9. no solution

10.

11. all real numbers

12.

13. all real numbers

14.

15. no solution

16.

17. no solution

18.

19. no solution

20.

21. all real numbers

22.

23. Answer 1. $\{0\}$

24.

Answer 2. all real numbers

Answer 3. no solution

Solving Inequalities with Special Solution Sets

25. no solution

26.

27. no solution

28.

29. $(-\infty, \infty)$ or all real numbers

30.

31. no solution

32.

33. no solution

34.

35. $(-\infty, \infty)$ or all real numbers

36.

37. $(-\infty, \infty)$ or all real numbers

38.

39. $(-\infty, \infty)$ or all real numbers

40.

Challenge41. Answer 1. $15x + 66$ Answer 2. $16(x + 4)$ **2.5 Isolating a Linear Variable****2.5.3 Exercises****Review and Warmup**1. $\{6\}$

2.

3. $\{-3\}$

4.

5. $\{6\}$

6.

7. $\{10\}$

8.

Solving for a Variable9. Answer 1. $t = 8$

10.

Answer 2. $y = p - r$ 11. Answer 1. $x = 2$

12.

Answer 2. $y = C - 7$ 13. Answer 1. $y = 10$

14.

Answer 2. $r = A - a$ 15. Answer 1. $r = 10$

16.

Answer 2. $t = \frac{m}{a}$ 17. Answer 1. $r = 30$

18.

Answer 2. $x = yn$ 19. Answer 1. $t = 8$

20.

Answer 2. $y = \frac{n-C}{x}$ 21. Answer 1. $x = \frac{n}{t}$

22.

Answer 2. $t = \frac{n}{x}$ 23. Answer 1. $y = C - x$

24.

Answer 2. $x = C - y$ 25. Answer 1. $B = q - br$

26.

Answer 2. $b = \frac{q-B}{r}$ 27. Answer 1. $n = \frac{y-c}{C}$

28.

Answer 2. $C = \frac{y-c}{n}$ 29. Answer 1. $b = 10$

30.

Answer 2. $b = \frac{2A}{h}$ 31. Answer 1. $y = 10$

32.

Answer 2. $y = xa - 10x$ 33. $x = \frac{y+b}{m}$

34.

35. $r = \frac{C}{2\pi}$

36.

37. $t = xC - xA$

38.

39. $x = 2a - 2r$

40.

41. $b = \left(-\frac{nA-nr}{9}\right)$

42.

43. $x = \frac{C-By}{A}$

44.

45. $y = (-7x) - 2$

46.

47. $y = 15 - 4x$

48.

49. $y = 4x - 18$

50.

51. $y = \frac{2}{3}x + 6$

52.

53. $y = \frac{3}{7}x + \frac{5}{7}$

54.

55. $y = -\frac{7}{29}x + \frac{110}{87}$

56.

2.6 Linear Equations and Inequalities Chapter Review

2.6.6 Exercises

1. Answer 1. $\{7\}$

2.

Answer 2. 35

Answer 3. $3x + 14$ 3. $\{1\}$

4.

5. $\{1\}$

6.

7. no solution

8.

9. $\{30\}$

10.

11. $\{16\}$

12.

13. Answer 1.

14.

 $\{y \mid y > 8\}$ or $\{y \mid 8 < y\}$ Answer 2. $(8, \infty)$

15.

16.

17. Answer 1.

 $(-\infty, \infty)$ or all real numbers $\{x \mid x < 4\}$ or $\{x \mid 4 > x\}$ Answer 2. $(-\infty, 4)$

18.

19. Answer 1. $\{t \mid t < 24\}$

20.

Answer 2. $(-\infty, 24)$

21. $x = \frac{C-By}{A}$

22.

23. $B = \left(-\frac{xC-xa}{7}\right)$

24.

25. 12

26.

27. 11

28.

29. 15

30.

31. Answer 1. 15 ft

Answer 2. 58 ft

32.

3 Graphing Lines

3.1 Cartesian Coordinates

3.1 Exercises

Identifying Coordinates

1. Answer 1. $(6, 4)$

2.

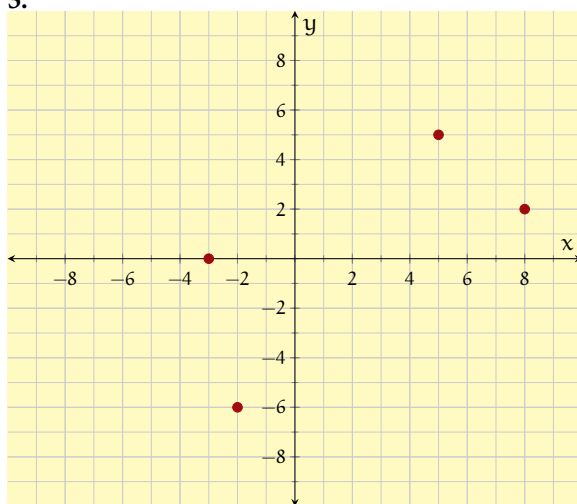
Answer 2. $(-7, 0)$

Answer 3. $(0, -4)$

Answer 4. $(7, 0)$

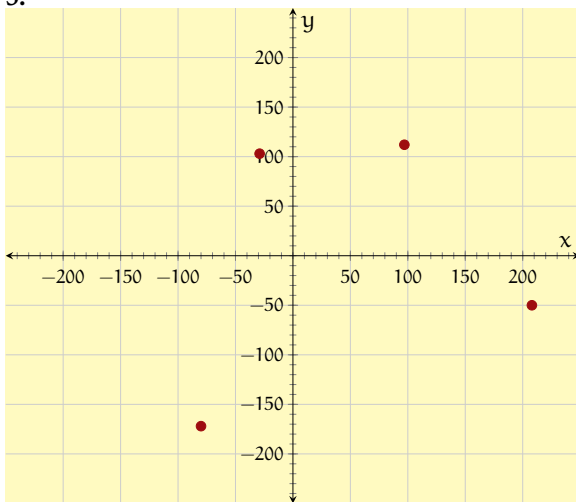
Creating Sketches of Graphs

3.



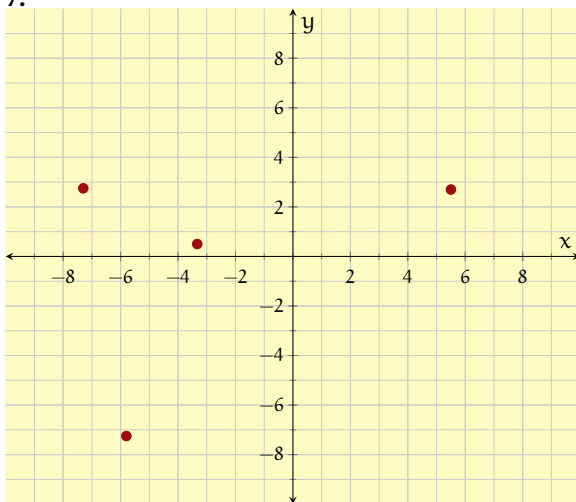
4.

5.



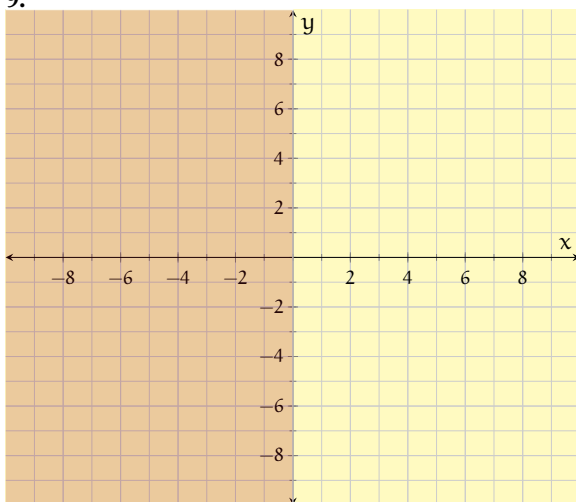
6.

7.



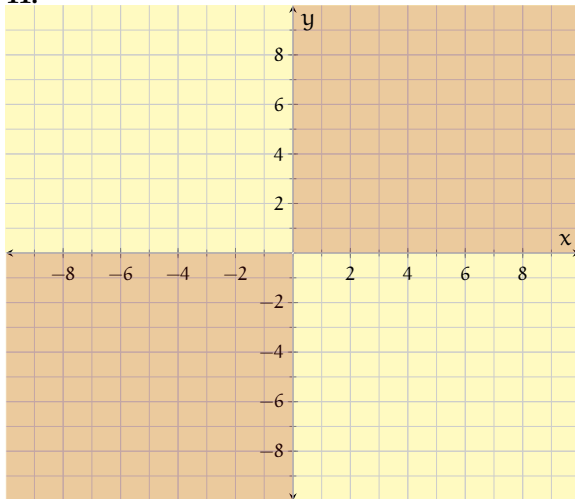
8.

9.



10.

11.



12.

Cartesian Plots in Context

13. Answer 1. (2011, 35)

Answer 2. 16

Answer 3. (2008, 5), (2010, 19), (2012, 51)

14.

Regions in the Cartesian Plane

15. Answer 1. IV

Answer 2. II

Answer 3. I

Answer 4. III

16.

17. Answer 1. I

Answer 2. III

Answer 3. IV

18.

19. Answer 1. Quadrant I

Answer 2. Quadrant IV

Answer 3. the x-axis

Answer 4. Quadrant III

Answer 5. the y-axis

Answer 6. Quadrant II

3.2 Graphing Equations**3.2 Exercises****Tables for Equations**

- 17. Answer 1. 14
- Answer 2. $(-8, 14)$
- Answer 3. 9
- Answer 4. $(-4, 9)$
- Answer 5. 4
- Answer 6. $(0, 4)$
- Answer 7. -1
- Answer 8. $(4, -1)$
- Answer 9. -6
- Answer 10. $(8, -6)$
- 19. $-1; -7; 0; 0; 1; 7; 2; 14; 3; 21$
- 21. $-1; 0; 0; 8; 1; 16; 2; 24; 3; 32$
- 23. $-3; -13; 0; -8; 3; -3; 6; 2; 9; 7$
- 25. $-9; 1; 0; -4; 9; -9; 18; -14; 27; -19$

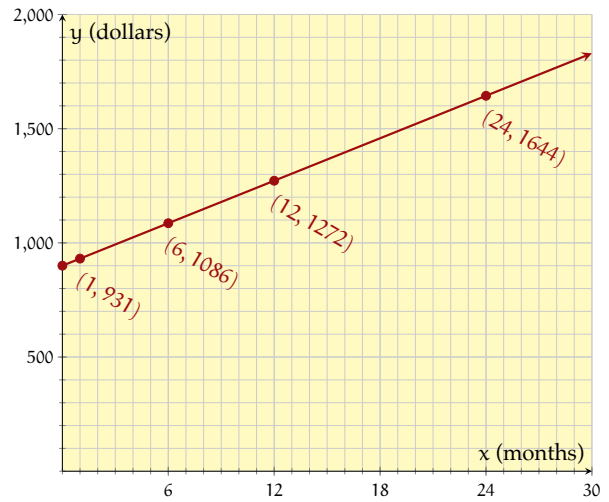
18.

- 20.
- 22.
- 24.
- 26.

Cartesian Plots in Context

27.

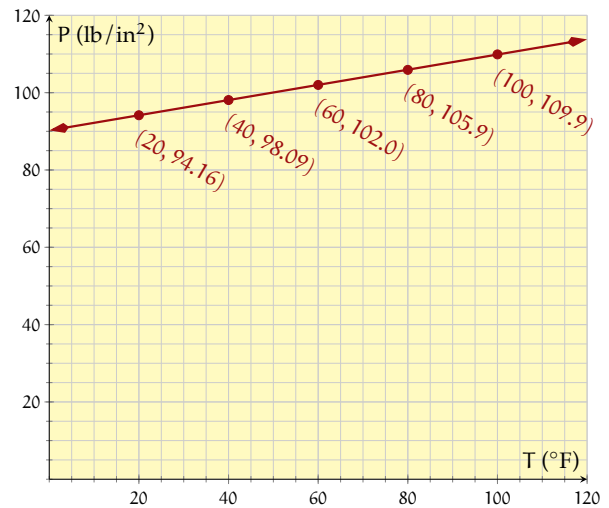
x	y	Point
0	900	$(0, 900)$
1	931	$(1, 931)$
6	1086	$(6, 1086)$
12	1272	$(12, 1272)$
24	1644	$(24, 1644)$



28.

29.

T	P	Point
20	≈ 94.16	$(20, 94.16)$
40	≈ 98.09	$(40, 98.09)$
60	≈ 102.0	$(60, 102.0)$
80	≈ 105.9	$(80, 105.9)$
100	≈ 109.9	$(100, 109.9)$

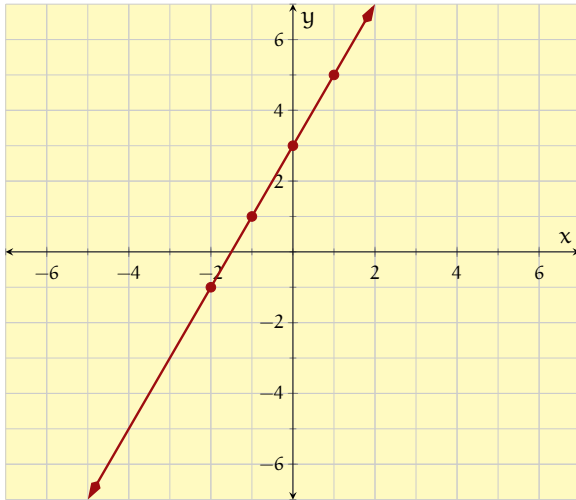


30.

Graphs of Equations

31.

x	$y = 2x + 3$	Point
-2	-1	$(-2, -1)$
-1	1	$(-1, 1)$
0	3	$(0, 3)$
1	5	$(1, 5)$
2	7	$(2, 7)$

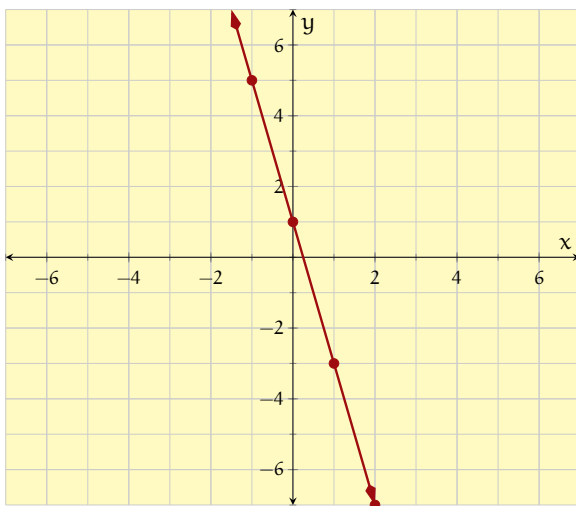


32.

33.

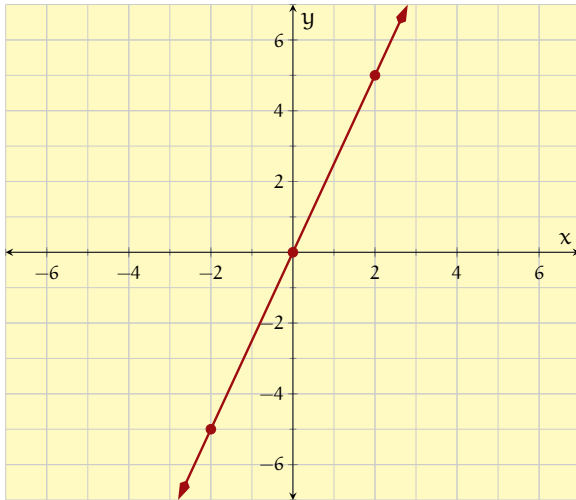
x	$y = -4x + 1$	Point
-2	9	$(-2, 9)$
-1	5	$(-1, 5)$
0	1	$(0, 1)$
1	-3	$(1, -3)$
2	-7	$(2, -7)$

34.



35.

x	$y = \frac{5}{2}x$	Point
-2	-5	$(-2, -5)$
-1	$-\frac{5}{2}$	$(-1, -\frac{5}{2})$
0	0	$(0, 0)$
1	$\frac{5}{2}$	$(1, \frac{5}{2})$
2	5	$(2, 5)$

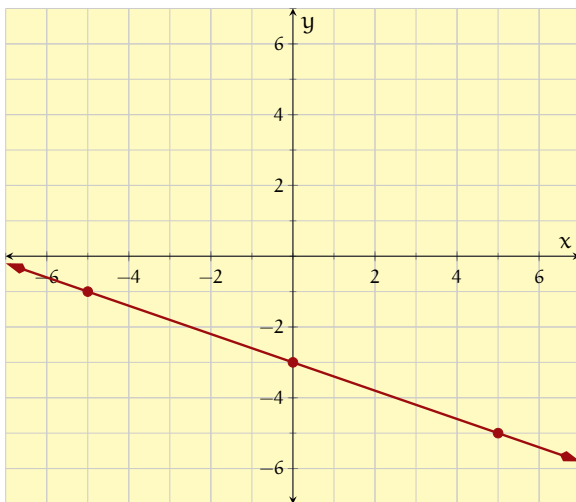


36.

37.

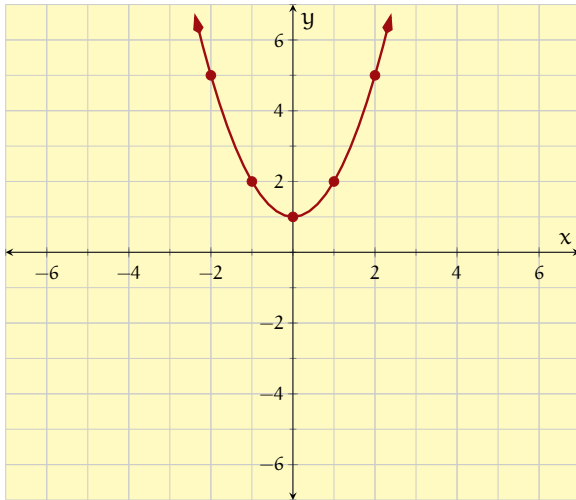
x	$y = -\frac{2}{5}x - 3$	Point
-5	-1	$(-5, -1)$
0	-3	$(0, -3)$
5	-5	$(5, -5)$

38.



39.

x	$y = x^2 + 1$	Point
-2	5	$(-2, 5)$
-1	2	$(-1, 2)$
0	1	$(0, 1)$
1	2	$(1, 2)$
2	5	$(2, 5)$

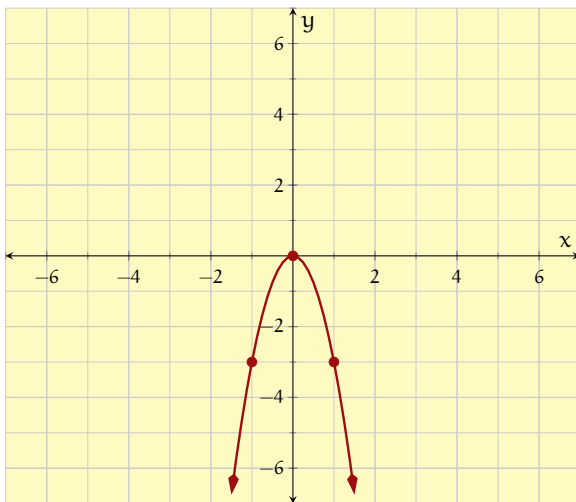


40.

41.

x	$y = -3x^2$	Point
-2	-12	$(-2, -12)$
-1	-3	$(-1, -3)$
0	0	$(0, 0)$
1	-3	$(1, -3)$
2	-12	$(2, -12)$

42.



21. $y = 5x - 3$

24.

27. $y = -\frac{5}{2}x - 1$

22.

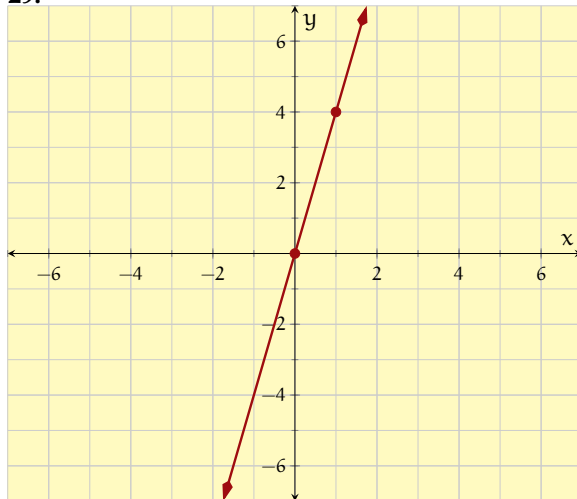
25. $y = \frac{3}{7}x$

28.

23. $y = -x - 1$

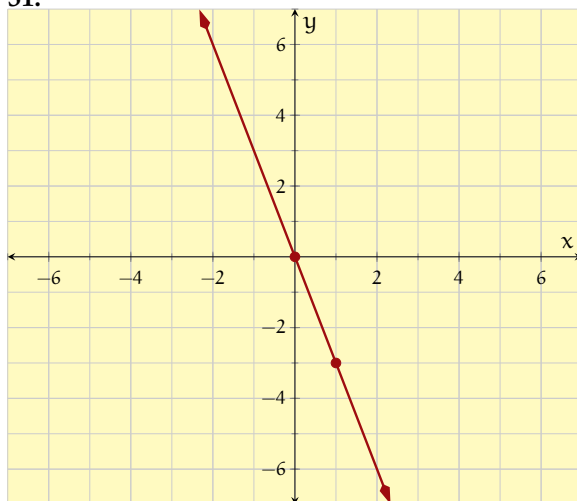
26.

29.



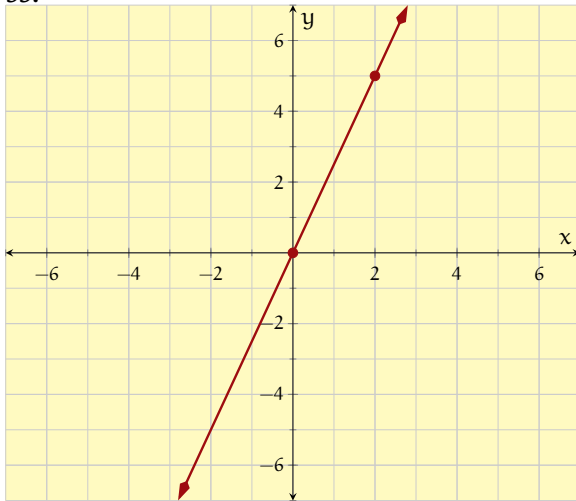
30.

31.



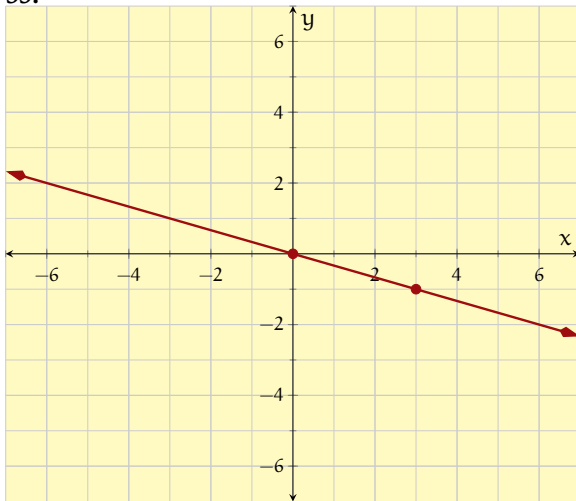
32.

33.



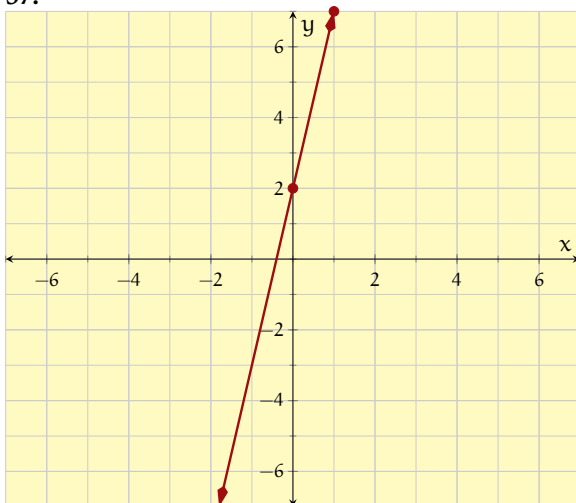
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35.



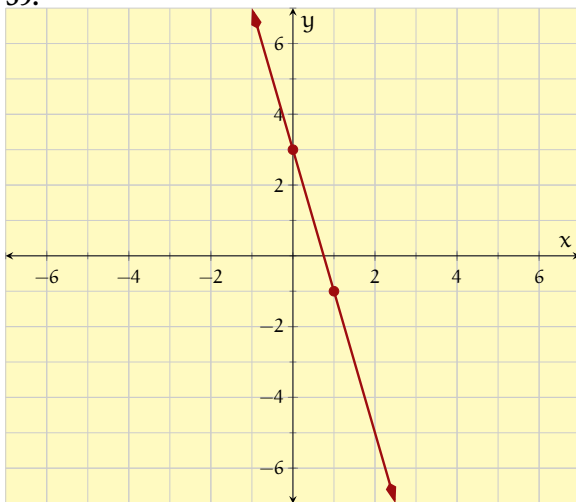
36.

37.



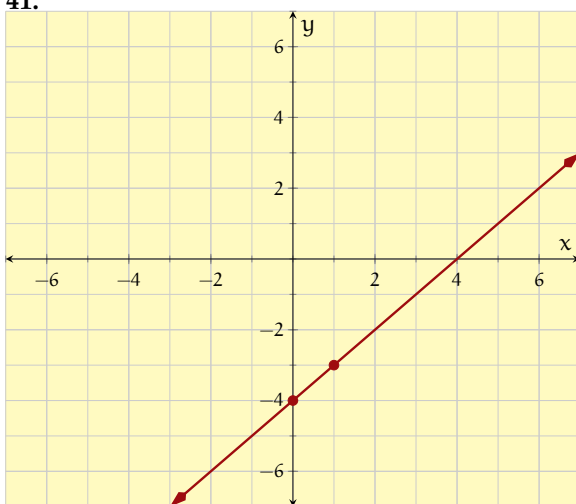
38.

39.



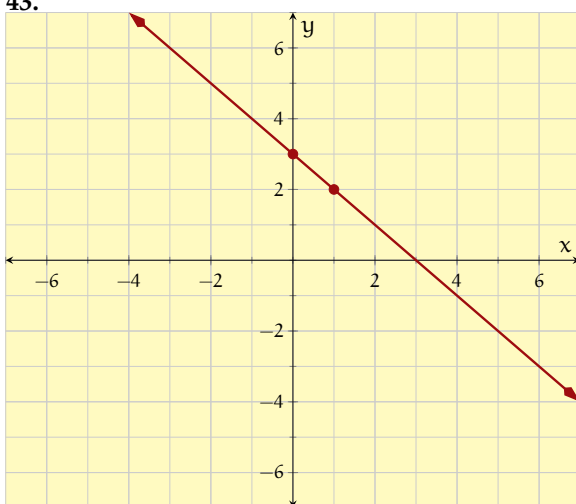
40.

41.



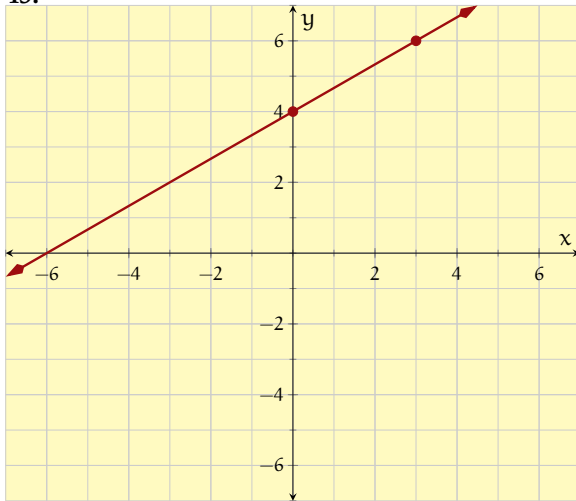
42.

43.



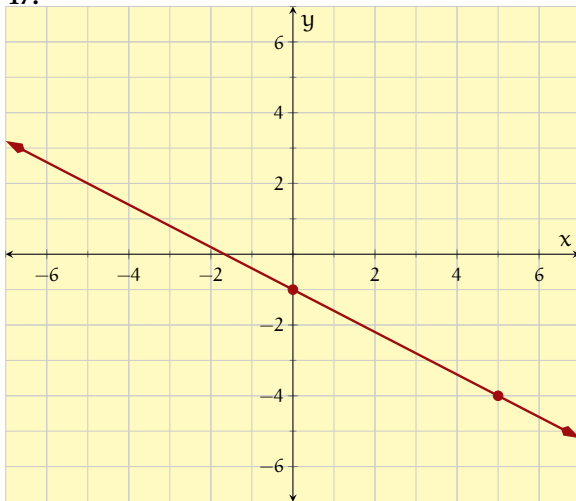
44.

45.



46.

47.



48.

Writing a Slope-Intercept Equation Given Two Points

49. $y = 4x + 4$

50.

51. $y = -2x + 3$

52.

53. $y = -x - 7$

54.

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

56.

57. $y = \frac{-6}{5}x + 7$

58.

Applications

59. 13

60.

61. 340

62.

63. 40

64.

65. Answer 1. $y = 0.05x + 18$

Answer 2. \$25.50

Answer 3. 490

66.

67. Answer 1. $y = 0.24x + 11.7$

Answer 2. 18.18

Answer 3. 59

68.

69. Answer 1. $y = -48000x + 761000$

Answer 2. \$281,000

Answer 3. 2015

70.

71. Answer 1. $y = -7.3x + 299.3$

Answer 2. 51.1

Answer 3. 41

72.

3.6 Point-Slope Form

3.6.5 Exercises

Review and Warmup

1. 60

2.

3. $-\frac{7}{9}$

4.

Point-Slope Form

5. Answer 1. 5

6.

Answer 2. (5, 28)

7. Answer 1. -2

8.

Answer 2. (-2, 5)

9. Answer 1. $-\frac{7}{8}$

10.

Answer 2. (-24, 20)

11. Answer 1. $\frac{9}{2}$

12.

Answer 2. (6, 24)

13. Answer 1. $y = 2(x - 5) + 15$

14.

Answer 2. $y = 2(x - 2) + 9$

15. Answer 1. $y = -3(x - 3) + -1$

16.

Answer 2. $y = -3(x - 2) + 2$

17. Answer 1. $y = \frac{6}{7}(x - 0) + 9$

18.

Answer 2. $y = \frac{6}{7}(x - 7) + 15$

19. Answer 1. $y = 5(x - 2) + 12$

20.

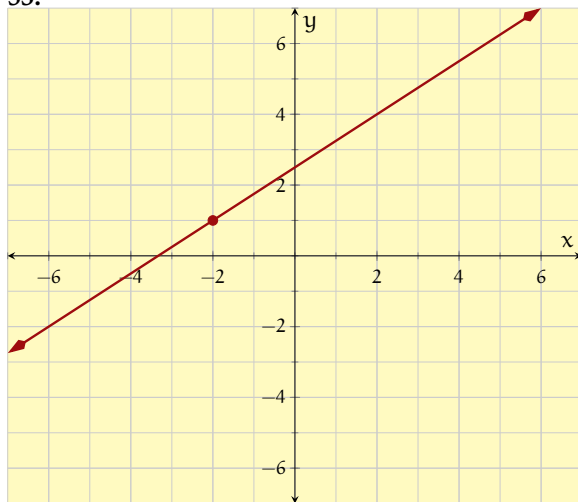
Answer 2. $y = 5x + 2$

21. Answer 1. $y = -5(x - -3) + 17$

22.

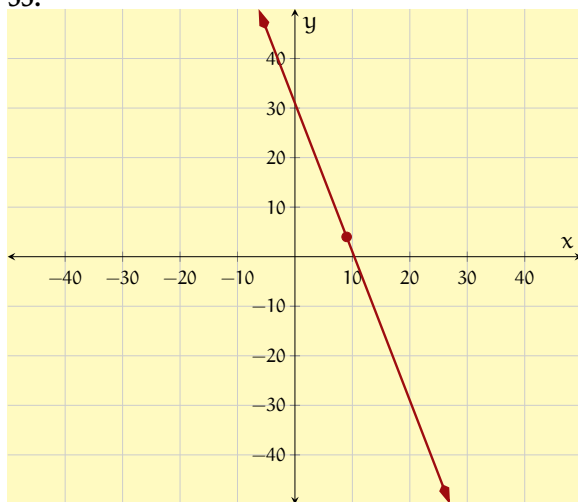
Answer 2. $y = -5x + 2$

53.



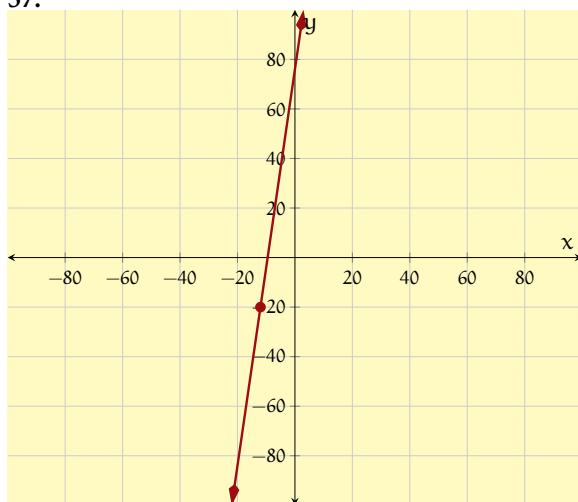
54.

55.



56.

57.



58.

Applications

59. Answer 1. $y = 0.04(x - 280) + 24.2$

Answer 2. \$19.80

Answer 3. 470

60.

61. Answer 1. $y = 0.21(x - 13) + 18.03$

Answer 2. 21.18

Answer 3. 57

62.

63. Answer 1. $y = (-44000)(x - 3) + 808000$ or $y = (-44000)(x - 6) + 676000$

Answer 2. \$500,000

Answer 3. 2021

64.

65. Answer 1. $y = (-2.4)(x - 6) + 81.6$ or $y = (-2.4)(x - 11) + 69.6$

Answer 2. 9.6

Answer 3. 40

66.

3.7 Standard Form

3.7.5 Exercises

Review and Warmup

1. $y = (-8x) + 18$

4.

2.

5. $y = \frac{2}{3}x + -\frac{2}{3}$

3. $y = (-3x) - 17$

6.

Slope and y-intercept

7. Answer 1. 3

Answer 2. (0, 4)

9. Answer 1. -5

Answer 2. (0, -3)

11. Answer 1. $-\frac{1}{4}$

Answer 2. (0, -2)

13. Answer 1. $\frac{6}{7}$

Answer 2. (0, -4)

15. Answer 1. $\frac{1}{6}$

Answer 2. (0, 0)

17. Answer 1. $-\frac{2}{3}$

Answer 2. $(0, \frac{4}{9})$

8.

10.

12.

14.

16.

18.

Converting to Standard Form

19. $5x - y = 2$

21. $7x - 8y = 40$

20.

22.

Graphs and Standard Form

23. Answer 1. 0

Answer 2. 7

Answer 3. (0,7)

Answer 4. 2

Answer 5. 0

Answer 6. (2,0)

24.

25. Answer 1. 0

Answer 2. 6

Answer 3. (0,6)

Answer 4. -15

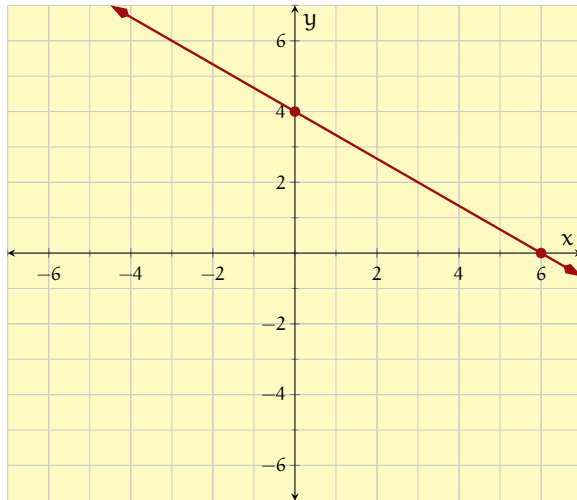
Answer 5. 0

Answer 6. (-15,0)

26.

27. x-intercept: (6,0)

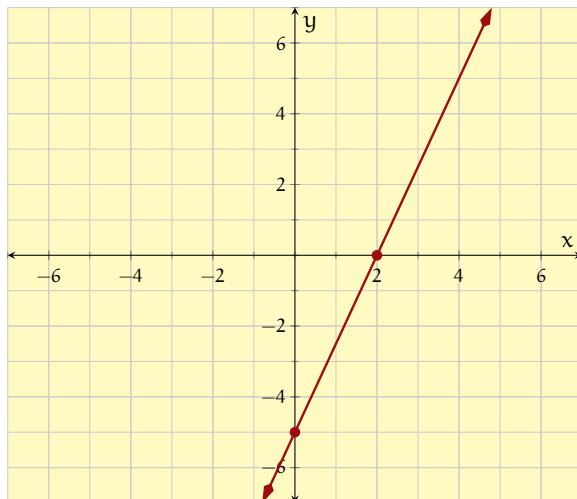
y-intercept: (0,4)



28.

29. x-intercept: (2,0)

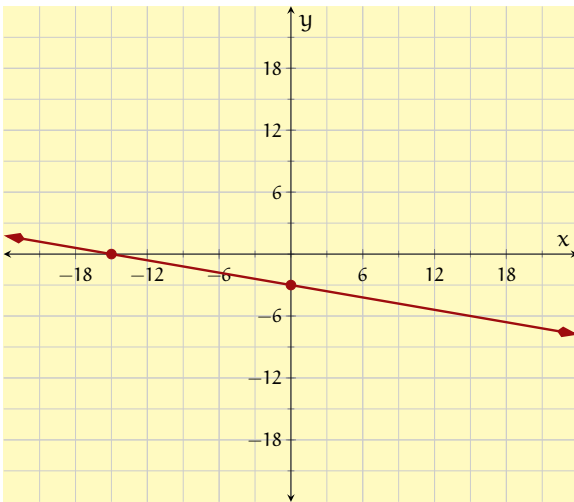
y-intercept: (0,-5)



30.

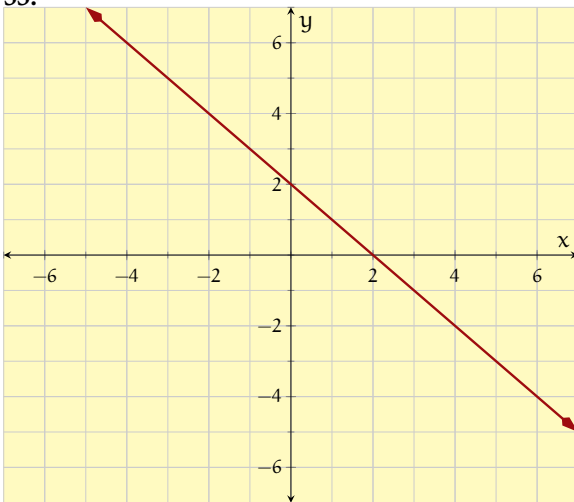
31. x-intercept: $(-15, 0)$
 y-intercept: $(0, -3)$

32.



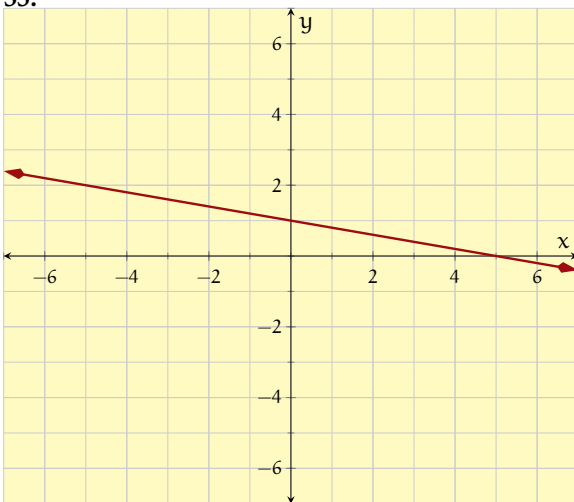
33.

34.

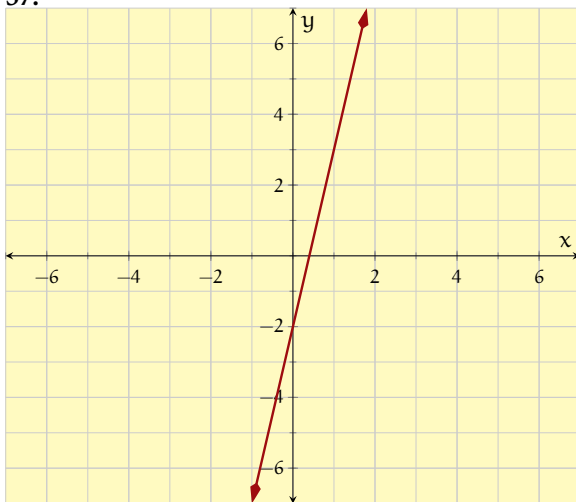


35.

36.

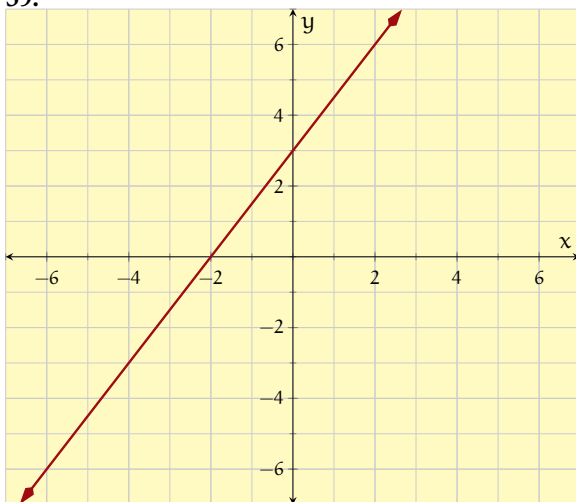


37.



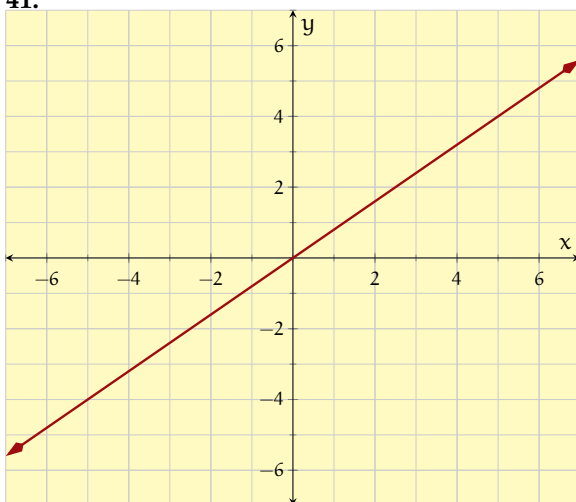
38.

39.



40.

41.



42.

Interpreting Intercepts in Context

43. C

44.

45. B

46.

47. C

48.

Challenge

49. Answer 1. 14

Answer 2. 10

Answer 3. 11

Answer 4. 10

Answer 5. 14

Answer 6. 11

3.8 Horizontal, Vertical, Parallel, and Perpendicular Lines**3.8.5 Exercises****Review and Warmup**

1. Answer 1. DNE

2.

3. 0

Answer 2. 0

4.

5. DNE or NONE

6.

Tables for Horizontal and Vertical Lines

11. Answer 1. 8

12.

Answer 2. $(-2, 8)$

Answer 3. 8

Answer 4. $(-1, 8)$

Answer 5. 8

Answer 6. $(0, 8)$

Answer 7. 8

Answer 8. $(1, 8)$

Answer 9. 8

Answer 10. $(2, 8)$ 13. Answer 1. -1

14.

Answer 2. $(-1, -2)$ Answer 3. -1 Answer 4. $(-1, -1)$ Answer 5. -1 Answer 6. $(-1, 0)$ Answer 7. -1 Answer 8. $(-1, 1)$ Answer 9. -1 Answer 10. $(-1, 2)$

Line Equations

15. $y = -3$

16.

17. $x = -1$

18.

19. $y = 3$

20.

21. $x = 8$

22.

Intercepts

23. Answer 1. none

Answer 2. none

Answer 3. none

Answer 4. -8 Answer 5. 0 Answer 6. $(-8, 0)$

24.

25. Answer 1. 0 Answer 2. -4 Answer 3. $(0, -4)$

Answer 4. none

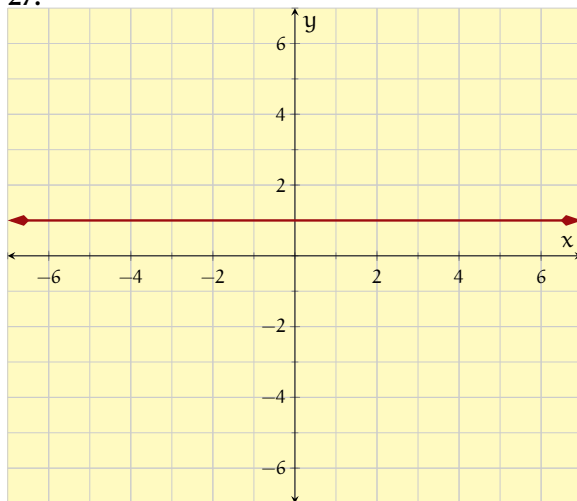
Answer 5. none

Answer 6. none

26.

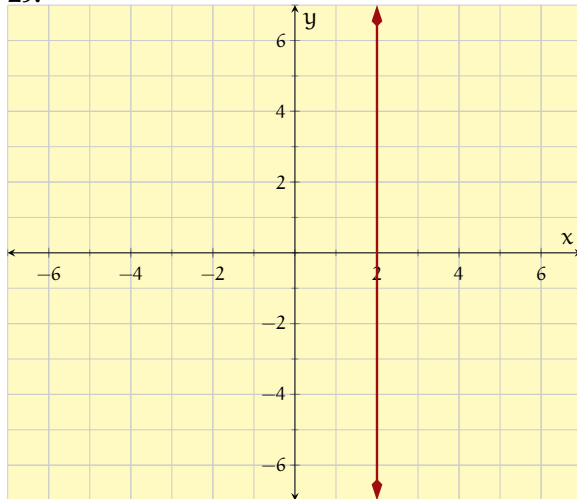
Graphs of Horizontal and Vertical Lines

27.



28.

29.



30.

Parallel or Perpendicular?

- | | |
|--|-----|
| 31. parallel | 32. |
| 33. perpendicular | 34. |
| 35. neither parallel nor perpendicular | 36. |
| 37. parallel | 38. |

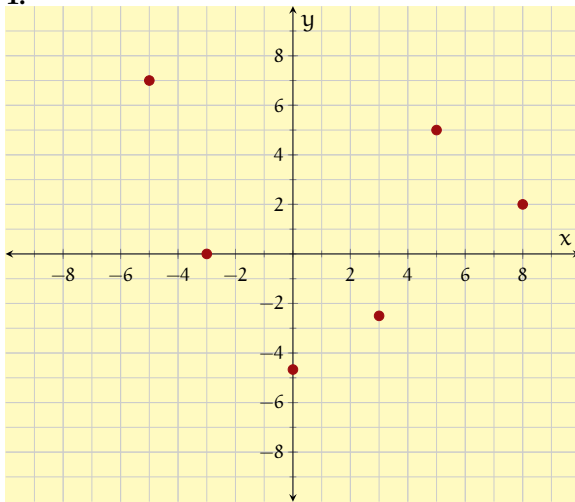
Parallel and Perpendicular Line Equations

- | | |
|--|-----|
| 39. $y = 5$ | 40. |
| 41. $x = -10$ | 42. |
| 43. Answer 1. $y = 4(x - 4) + 18$ | 44. |
| Answer 2. $y = 4x + 2$ | 46. |
| 45. Answer 1. $y = -\frac{1}{7}(x + 2) - \frac{5}{7}$ | 48. |
| Answer 2. $y = -\frac{1}{7}x - 1$ | 50. |
| 47. $y = x - 3$ | |
| 49. Answer 1. $y = \frac{5}{6}(x - 2) + \frac{14}{3}$ | |
| Answer 2. $y = \frac{5}{6}x + 3$ | |

3.10 Graphing Lines Chapter Review

3.10.9 Exercises

1.



2.

5. $y = 2x - 4$

6.

7. $\frac{4}{5}$

8.

9. $\frac{6}{5}$

10.

11. $-\frac{8}{9}$

12.

13. $-\frac{3}{4}$

14.

15. 0

16.

17. DNE or NONE

18.

19. $y = -\frac{7}{4}x - 1$

20.

21. Answer 1. $\frac{3}{8}$

22.

Answer 2. $(0, 4)$

23. Answer 1. $y - -6 = \frac{2}{9}(x - 9)$

24.

Answer 2. $y - -12 = \frac{2}{9}(x - -18)$

25. Answer 1. $y = -3x + 132$

Answer 2. 39

Answer 3. 44

26.

27. Answer 1. 0

Answer 2. -18

Answer 3. $(0, -18)$

Answer 4. -15

Answer 5. 0

Answer 6. $(-15, 0)$

28.

29. Answer 1. 9

30.

Answer 2. $(0, 7)$

31. Answer 1. $-\frac{1}{2}$

Answer 2. $(0, \frac{1}{6})$

33. Answer 1. -7

Answer 2. $(-7, -2)$

Answer 3. -7

Answer 4. $(-7, -1)$

Answer 5. -7

Answer 6. $(-7, 0)$

Answer 7. -7

Answer 8. $(-7, 1)$

Answer 9. -7

Answer 10. $(-7, 2)$

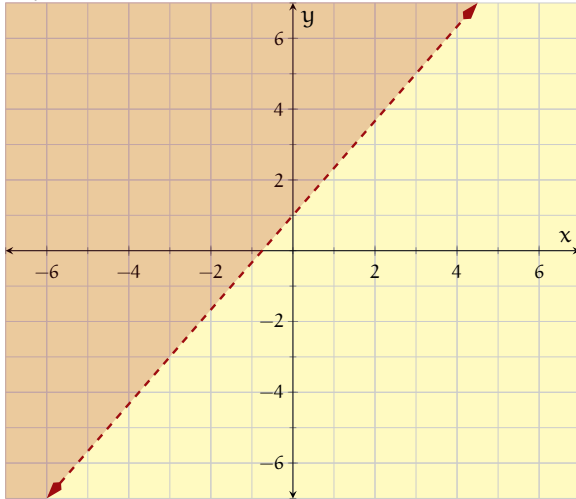
35. $y = 2$

37. parallel

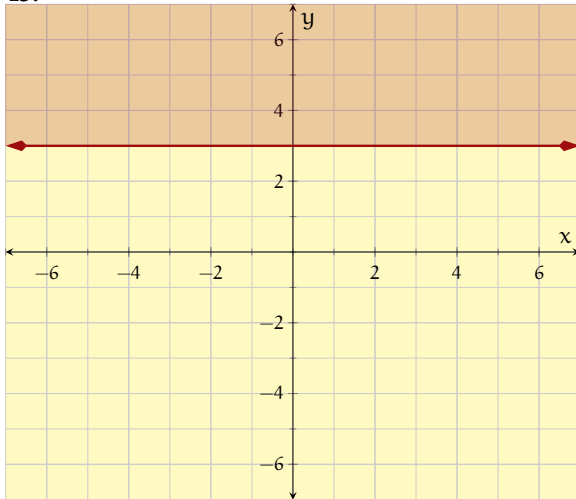
39. Answer 1. $y = -\frac{4}{9}x + 5$

Answer 2. $y - 9 = -\frac{4}{9}(x + 9)$

41.



43.



32.

34.

36.

38.

40.

42.

44.

4 Systems of Linear Equations

4.1 Solving Systems of Linear Equations by Graphing

4.1.4 Exercises

Warmup and Review

1. Answer 1. 3 2.

Answer 2. $(0, 5)$

3. Answer 1. -1 4.

Answer 2. $(0, -1)$

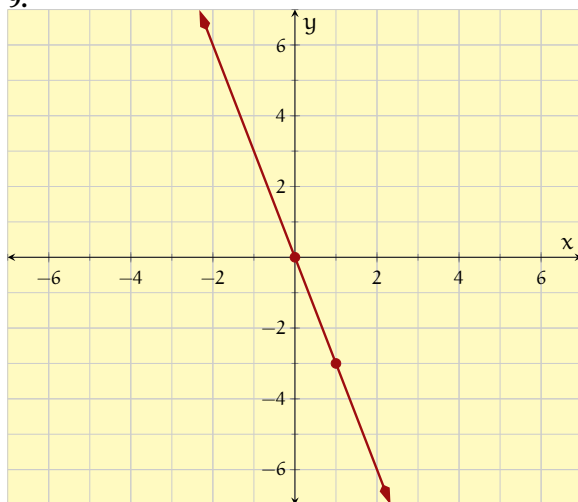
5. Answer 1. $-\frac{6}{5}$ 6.

Answer 2. $(0, 7)$

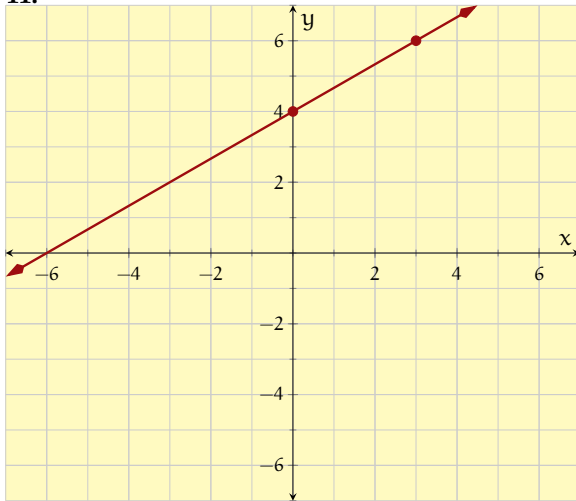
7. Answer 1. $\frac{1}{10}$ 8.

Answer 2. $(0, -4)$

9. 10.



11.



12.

13. $y = (-8x) - 4$

14.

15. $y = 10 - 2x$

16.

Checking Solutions for System of Equations

17. is

18.

19. is

20.

21. is

22.

Using a Graph to Solve a System

23. $x = -2$ and $y = 1$

24.

25. $x = -1$ and $y = -5$

26.

27. $x = 2$ and $y = -2$

28.

29. $x = 1$ and $y = -1$

30.

31. $x = 2$ and $y = -3$

32.

33. $x = 1$ and $y = 3$

34.

35. $x = 2$ and $y = 6$

36.

37. no solution

38.

39. no solution

40.

41. $\{(x, y) \mid y = -\frac{3}{5}x + 7\}$

42.

Determining the Number of Solutions in a System of Equations

43. no solution

44.

45. one solution

46.

47. one solution

48.

49. one solution

50.

4.2 Substitution

4.2.5 Exercises

Review and Warmup

1. $\{(-43/72)\}$

2.

3. $\{-37\}$

4.

5. $y = 10 - 8x$

6.

7. $y = (-5x) - 12$

8.

9. $y = 6x + 16$

10.

Solving System of Equations Using Substitution

11. $r = 4$ and $c = 7$

14.

17. $c = 4$ and $a = -7$

20.

23. $x = 0$ and $y = -15$

26.

29. $m = -\frac{4}{5}$ and $A = \frac{22}{25}$

32.

35. $p = \frac{3}{8}$ and $c = 1$

38.

41. $x = \frac{5}{72}$ and $y = \frac{37}{24}$

44.

47. $(\frac{2}{3}, \frac{7}{2})$

50.

53. $(-9, 2)$

56.

59. infinite number of solutions

12.

15. $x = 2$ and $y = 11$

18.

21. $x = -2$ and $y = 8$

24.

27. $B = 4$ and $y = -6$

30.

33. $x = \frac{9}{7}$ and $y = -\frac{8}{7}$

36.

39. $x = -\frac{55}{39}$ and $y = -\frac{17}{26}$

42.

45. $(\frac{2}{5}, \frac{9}{8})$

48.

51. $(8, -4)$

54.

57. no solution

60.

13. $x = -1$ and $y = 4$

16.

19. $b = 1$ and $m = -25$

22.

25. no solutions

28.

31. $x = -\frac{13}{20}$ and $y = \frac{1}{4}$

34.

37. $r = 5$ and $t = -\frac{45}{2}$

40.

43. $x = 3$ and $y = -4$

46.

49. $(3, 10)$

52.

55. $(-4, 9)$

58.

Applications

61. Answer 1. 245

Answer 2. 50

62.

63. 220

64.

65. Answer 1. 20

Answer 2. 5

66.

67. Answer 1. \$9,000

Answer 2. \$4,000

68.

69. Answer 1. 200

Answer 2. 400

70.

71. Answer 1. \$38,000

Answer 2. \$14,000

72.

73. Answer 1. \$13,600

Answer 2. \$26,400

74.

75. Answer 1. 400

Answer 2. 400

76.

77. Answer 1. 1200

Answer 2. 2800

4.3 Elimination

4.3.5 Exercises

Review and Warmup

1. $\{(-21/40)\}$

4.

2.

5. $\{-1\}$

3. $\{-25\}$

6.

Solving System of Equations by Elimination

7. $(5, -8)$

10.

13. $(-2, -10)$

16.

19. $q = -10$ and $C = 14$

22.

25. $x = \frac{11}{19}$ and $y = -\frac{13}{19}$

28.

31. no solutions

34.

37. $(\frac{2}{9}, \frac{5}{2})$

8.

11. $(-7, 5)$

14.

17. infinite number of solutions

20.

23. $x = -4$ and $y = 14$

26.

29. $c = -\frac{19}{20}$ and $p = \frac{67}{60}$

32.

35. $(2, \frac{5}{6})$

38.

9. $(10, -1)$

12.

15. no solution

18.

21. $x = \frac{22}{19}$ and $y = -\frac{12}{19}$

24.

27. $x = -2$ and $y = -\frac{3}{4}$

30.

33. infinitely many solutions

36.

Applications

39. Answer 1. 10

Answer 2. 7

40.

41. Answer 1. \$9,500

Answer 2. \$2,500

42.

43. Answer 1. 180

Answer 2. 420

44.

45. Answer 1. 89

Answer 2. 146

46.

47. 11

48.

49. Answer 1. 764

Answer 2. 1236

Challenge

50.

4.4 Systems of Linear Equations Chapter Review**4.4.4 Exercises****Substitution**

9. $x = 5$ and $y = -22$

10.

11. $(7, -8)$

12.

13. $(-9, -1)$

14.

15. infinite number of solutions

16.

17. Answer 1. 58

Answer 2. 30

18.

19. Answer 1. 12

Answer 2. 7

20.

21. Answer 1. \$4,000

Answer 2. \$6,000

22.

23. Answer 1. 1400

Answer 2. 3600

24.

Elimination

25. $(-3, -5)$

26.

27. $(2, 2)$

28.

29. no solution

30.

31. infinite number of solutions

32.

33. Answer 1. 10

Answer 2. 7

34.

35. Answer 1. 1200

Answer 2. 3800

36.

37. Answer 1. $26 \frac{\text{mi}}{\text{hr}}$ Answer 2. $3 \frac{\text{mi}}{\text{hr}}$

38.

II Preparation for STEM

5 Exponents and Polynomials

5.1 Adding and Subtracting Polynomials

5.1.5 Exercises

Review and Warmup

1. Answer 1. $6s, -0.9z, 3.5$ 2.

Answer 2. $-y, -6.5z^2$

Answer 3. $1.6y^2, 6.7z, -0.2x, -2.2t^2$

Answer 4. $-0.5x, 6.2z, -2, 3.4y^2$

3. Answer 1. $-8.9s, -2.6, -0.6x, 2.8y$ 4.

Answer 2. $-2.6t, -6.8x^2, 6.4$

Answer 3. $5.8z^2, 4.7s^2, 3.4$

Answer 4. $-8.4y^2$

5. Answer 1. $-22t$ 6.

Answer 2. $8s + 3t$

Answer 3. $7z^2 + 11s^2$

Answer 4. $-5z + 3y^2$

7. Answer 1. $-\frac{35}{72}t$ 8.

Answer 2. $-\frac{2}{3}x + 5s$

Answer 3. $-\frac{5}{7}z$

Answer 4. $-\frac{6}{7}s^2 - \frac{1}{5}t^2$

Vocabulary Questions

9. Answer 1. binomial

Answer 2. 12

10.

11. Answer 1. monomial

Answer 2. 0

12.

13. Answer 1. trinomial

Answer 2. 11

14.

15. **Answer 1.** trinomial

Answer 2. 7

16.

17. **Answer 1.** monomial

Answer 2. 11

18.

19. 14

20.

Simplifying Polynomials

21. $-x - 7$

22.

23. $9x$

24.

25. $x^2 - 16x + 4$

26.

27. $y^3 - 11y^2 - 11$

28.

29. $11r^6 - 12r^4 - 5r^2$

30.

31. $1.2t^5 - 0.3t^4 - 0.9t^3 - 0.1t^2$

32.

33. $x^3 - 7x^2 - 2x + \frac{29}{12}$

34.

35. $6x + 4$

36.

37. $-6x^2 + 10x$

38.

39. $-5x^9 - 3x^4 + 5x^3 + 6$

40.

41. $-6x^2 - 2x - 6$

42.

43. $-15x^6$

44.

45. $-5x^3 + 11x^2 + x - 12$

46.

47. $21r^{16} - 6r^{15} + 11r^{14}$

48.

49. $36t^{13} + 20t^{12}$

50.

51. $-x^7y^3 + 12xy$

52.

53. $19x^9y^7 + 15xy + 17$

54.

55. $3x^8y^9 - 2x^5y^3 + 17xy$

56.

57. $10x^6 + 6xy + 3y^9$

58.

59. $-8x^7y^6 + 12x^2y^4 - 3xy$

60.

61. $5x^4 - 7y^2 - 3x^2y^2 - 7x^4y^2$

62.

63. $3y^{18} + 7y^7 + 6y^5$

64.

65. $5x^3y^7 - 3xy$

66.

Evaluating Polynomials

- | | |
|-------------------|-----|
| 67. Answer 1. 25 | 68. |
| Answer 2. 16 | |
| 69. Answer 1. -16 | 70. |
| Answer 2. -4 | |
| 71. Answer 1. 8 | 72. |
| Answer 2. -8 | |
| 73. Answer 1. 4 | 74. |
| Answer 2. 8 | |
| 75. -4 | 76. |
| 77. -6 | 78. |
| 79. -208 | 80. |
| 81. -384 | 82. |

Applications of Simplifying Polynomials

- | | |
|--------------------------------|-----|
| 83. 171.1 m | 84. |
| 85. $1.5x^2 + 3.2x$ | |
| 86. | |
| 87. $56x^2 + 68.5$ | |
| 88. | |
| 89. $4x^3 + 8x^2 + 31.5x + 75$ | |
| 90. | |
| 91. $4x^4 - 6x^3 + 6x^2 - 15$ | |
| 92. | |

5.2 Introduction to Exponent Rules**5.2.4 Exercises****Review and Warmup**

- | | | |
|-----------------|-----------------|----------------|
| 1. Answer 1. 4 | 2. | 3. Answer 1. 1 |
| Answer 2. 27 | | Answer 2. -1 |
| Answer 3. 16 | | Answer 3. 1 |
| Answer 4. -27 | | Answer 4. 0 |
| 4. | 5. Answer 1. 25 | 6. |
| | Answer 2. -4 | |
| 7. Answer 1. -8 | 8. | |
| Answer 2. -64 | | |

Exponent Rules

- | | | | |
|---------------|-----|----------------|-----|
| 9. 9^8 | 10. | 11. 3^{16} | 12. |
| 13. y^{14} | 14. | 15. r^{31} | 16. |
| 17. 18^{27} | 18. | 19. t^4 | 20. |
| 21. $9t^2$ | 22. | 23. $64r^3y^3$ | 24. |

25. $9t^{20}$

29. $-729r^9$

33. Answer 1. $100t^6$

Answer 2. $-100t^6$

35. $-\frac{y^{28}}{28}$

37. $-18x^2 + 3x$

38.

39. $-9t^5 + 36t^4$

40.

41. $30c^2 + 10c + 3$

42.

43. $18m^4 - 6m$

44.

45. $30q^5 + 17q^2$

46.

47. Answer 1. $2r^2$

Answer 2. r^4

Answer 3. $r^2 + r^3$

Answer 4. r^5

50.

53. Answer 1. $-5n^4$

Answer 2. $6n^8$

Answer 3. $-2n^4 - 4n^2$

Answer 4. $8n^6$

56.

57. $-48t^{15}$

59. $24c^{10}r^{15}$

61. $-24m^7$

63. $-64q^{20} - 6q^8$

65. $102r^7$

67. $13b^4q^{10}$

26.

30.

34.

27. $-20r^{27}$

31. $28y^{38}$

36.

28.

32.

48.

51. Answer 1. $-q^2$

Answer 2. $-2q^4$

Answer 3. $-2q^2 + 4q^3$

Answer 4. $-8q^5$

54.

49. Answer 1. $2b^3$

Answer 2. b^6

Answer 3. $b^3 + b^2$

Answer 4. b^5

52.

55. Answer 1. $5x^2 + 4x$

Answer 2. $16x^5$

Challenge

69. Answer 1. 1

Answer 2. 89

Answer 3. 1449

70.

71. Answer 1. $-3x$; $-10x$

Answer 2. $-5x^{25}$; $-10x^{25}$

Answer 3. 5 ; x^{35} ; x^{20}

5.3 Dividing by a Monomial

5.3.4 Exercises

Quotient of Powers Rule

1. y^2

2.

3. $-5y^7$

4.

5. $\frac{r^3}{6}$

6.

7. $3y^8$

8.

9. $\frac{r^{12}}{4}$

10.

11. r^1

12.

13. 13^6

14.

15. $16^8 \cdot 14^2$

16.

17. $-5x^3y^7z$

18.

19. $2x^6y^6$

20.

Dividing Polynomials by Monomials

21. $-4y^{17} + 13y^8$

22.

23. $4y^{11} + 4y^6 - 2y^4$

24.

25. $13r^{12} + 10r^6$

26.

27. $-6t^{11} + 13t^7 + 11t^5 + 13t^4$

28.

29. $-10xy + 2 - 10y$

30.

31. $-4x^9y^{20} + 10x^6y^{15} + 13x^7y^{18}$

32.

33. $-8r^{17} - 5r^{12} + r^4$

34.

Application Problems

35. $6x^4 - 7x^2 - 3x$

36.

37. $9x^4 + 6x^3 - 3x$

38.

5.4 Multiplying Polynomials

5.4.5 Exercises

Review and Warmup

1. x^{19}

2.

3. $-20y^{30}$

4.

5. $9y^{24}$

6.

7. Answer 1. 1

8.

9. Answer 1. $8.2x, 6.3s^2$

Answer 2. 2

Answer 2. $7.9y, 6z, -3.4z^2$

Answer 3. 4

Answer 3. $-6.5y, -3.6t, 3.1$

Answer 4. 4

Answer 4. $2.8t$

10.

13. Answer 1. $-4s + 8t + 3x^2$

Answer 2. $-13x$

Answer 3. $-6x^2 + 4s^2$

Answer 4. $-6y^2 + 8s^2$

16.

Multiplying Monomials with Binomials

17. $-5x^2 - 45x$

20.

23. $-40t^4 + 32t^3$

26.

29. $63a^{32}b^{39} - 56a^{35}b^{38}$

31. $-63a^{14} - 72a^9b^9 + 90a^5b^7$

11. Answer 1. $-6.7x, 4.6t, 3.9z$

Answer 2.

$3.5z^2, 6.5t, 6.5, -5.5y$

Answer 3. $-4.5z^2, 8.9s^2$

Answer 4. $8.6t, -3s^2, -0.9s^2$

14.

12.

15. Answer 1. $-5s$

Answer 2. $\frac{4}{3}x + -\frac{8}{5}s + 7t$

Answer 3.

$-1 + -\frac{2}{5}t - \frac{5}{9}x^2 - 7t^2$

Answer 4. $-\frac{8}{9}x + -\frac{5}{3}t$

Multiplying Monomials with Binomials

17. $-5x^2 - 45x$

20.

23. $-40t^4 + 32t^3$

26.

29. $63a^{32}b^{39} - 56a^{35}b^{38}$

31. $-63a^{14} - 72a^9b^9 + 90a^5b^7$

18.

21. $4x^3 - 20x^2$

24.

27. $50x^{17}y^5 + 45x^{12}y^8$

19. $42x^2 + 60x$

22.

25. $-18x^4 + 6x^3 - 10x^2$

28.

Applications of Multiplying Monomials with Binomials

33. $3w^2 - w$

35. $2b^2 + 2b$

37. $h^2 + 7h$

34.

36.

38.

Multiplying Binomials

39. $r^2 + 12r + 20$

42.

45. $y^2 - 15y + 54$

48.

51. $2x^2 - 11x + 5$

54.

57. $10r^5 + 100r^3 + 5r^2 + 50$

60.

63. $5a^2 + 41ab - 36b^2$

66.

69. $5x^2 - 15x - 50$

72.

40.

43. $x^2 + 5x - 36$

46.

49. $5t^2 - 34t + 45$

52.

55. $15y^3 - 12y^2 - 30y + 24$

58.

61. $a^2 + 6ab + 9b^2$

64.

67. $54a^2b^2 - 78ab + 28$

70.

73. $-2y^2 + 13y - 15$

41. $6t^2 + 33t + 36$

44.

47. $4r^2 + 23r + 28$

50.

53. $4x^2 + 2x - 2$

56.

59. $3t^4 - 28t^2 + 49$

62.

65. $21a^2 - ab - 36b^2$

68.

71. $x^3 - 13x^2 + 36x$

74.

Applications of Multiplying Binomials

75. $-50x^2 + 530x + 2380$

77. $x^2 - 81$

76.

78.

Multiplying Larger Polynomials

79. $-2x^3 + 8x^2 - 4x - 8$

80.

Binomials Raised to Other Powers

61. $r^3 + 18r^2 + 108r + 216$

62. $r^3 + 18r^2 + 108r + 216$

65. $64t^3 + 96t^2 + 48t + 8$

66. $64t^3 + 96t^2 + 48t + 8$

69. Answer 1. False

Answer 2. False

Answer 3. True

63. $r^3 - 6r^2 + 12r - 8$

64.

67. $125x^3 - 150x^2 + 60x - 8$

68.

70.

5.6 More Exponent Rules**5.6.7 Exercises****Review and Warmup**

1. Answer 1. 9

2.

Answer 2. 8

Answer 3. 16

Answer 4. -8

3. 6^8

4.

5. 7^{18}

6.

Simplifying Products and Quotients Involving Exponents

7. r^{26}

8.

9. y^{28}

10.

11. $16r^{24}$

12.

13. $-18y^{17}$

14.

15. $-\frac{r^{28}}{64}$

16.

17. $128r^6$

18.

19. 1

20.

21. -1

22.

23. 2

24.

25. 48

26.

27. 1

28.

29. $\frac{x^{21}}{125}$

30.

31. $\frac{49}{100x^{12}}$

32.

33. $\frac{25x^{18}}{36}$

34.

35. $\frac{x^{12}}{4y^6z^{20}}$

36.

37. $\frac{25x^8}{64y^{18}}$

38.

39. 36

40.

41. $\frac{64}{49}$

42.

43. $-\frac{1}{40}$

44.

45. $\frac{5}{x^4}$

46.

47. $9x^6$

48.

49. $\frac{14}{x^{10}}$

50.

51. $18x^{18}$

52.

53. $\frac{16x^3}{17}$

54.

55. $\frac{r^8}{y^{12}}$

56.

57. $\frac{1}{t^{17}y^8}$

58.

59. $\frac{r^5}{8}$

60.

61. $\frac{1}{t^{22}}$

62.

63. $\frac{3}{x^5}$

64.

65. $\frac{-11}{3y^1}$

66.

67. $\frac{1}{r^8}$

68.

69. $\frac{1}{t^{58}}$

70.

- | | | | |
|-------------------------------------|------|-------------------------------|------|
| 71. $\frac{1}{x^{15}}$ | 72. | 73. $\frac{35}{y^5}$ | 74. |
| 75. $\frac{81}{100}$ | 76. | 77. $-\frac{1}{512}$ | 78. |
| 79. 100 | 80. | 81. -24 | 82. |
| 83. $\frac{1}{125}$ | 84. | 85. $\frac{9}{14}$ | 86. |
| 87. 81 | 88. | 89. $-\frac{1}{8}$ | 90. |
| 91. $\frac{125}{y^{13}}$ | 92. | 93. $25y^{25}$ | 94. |
| 95. $\frac{1}{r^{30}}$ | 96. | 97. $\frac{1}{256t^{68}}$ | 98. |
| 99. $-\frac{x^{21}}{125}$ | 100. | 101. $\frac{y^{36}}{64}$ | 102. |
| 103. $\frac{42t^{13}}{5}$ | 104. | 105. t^5 | 106. |
| 107. $9x^1$ | 108. | 109. $\frac{1}{y^{14}}$ | 110. |
| 111. $\frac{1}{y^{20}}$ | 112. | 113. $\frac{1}{r^{36}y^{18}}$ | 114. |
| 115. $\frac{t^{30}}{r^{36}}$ | 116. | 117. $\frac{8}{x^{45}}$ | 118. |
| 119. $\frac{x^{21}}{y^{33}}$ | 120. | 121. $\frac{x^{25}}{r^{15}}$ | 122. |
| 123. $\frac{8y^3}{27x^2z^3}$ | | 124. | |
| 125. $\frac{1}{x^{18}y^{30}z^{24}}$ | | 126. | |

Challenge

127. Answer 1. 9; -1; 1

Answer 2. 8; -7; 7

128.

129. Answer 1. 10; -2; 1

Answer 2. none

Answer 3. none

Answer 4. none

5.7 Exponents and Polynomials Chapter Review**5.7.7 Exercises****Adding and Subtracting Polynomials**

1. Answer 1. binomial

Answer 2. 12

2.

3. 15

4.

5. $-12x^2 - 14x - 11$

6.

7. $-19x^4 + 10x^2$

8.

9. $x^3 + 6x^2 - 7x + \frac{7}{4}$

10.

11. $-6x^2 + 3x$

13. $-20x^2 - 2x + 12$

15. $5x^6 - 4x^4 + 6x^2$

17. $3x^3 - 10xy + 7y^9$

19. $63x^2 - 40$

12.

14.

16.

18.

20.

Introduction to Exponent Rules

21. 8^7

25. t^{27}

29. y^{81}

33. $36r^{12}$

37. $\frac{t^{31}}{27}$

22.

26.

30.

34.

23. t^{19}

27. 10^{35}

31. $16y^4$

35. $-8x^{15}$

38.

24.

28.

32.

36.

Dividing by a Monomial

39. $-7t^{14} - 12t^{11}$

42.

40.

43. $10x^9 + 12x^7$

41. $x^{18} - x^9 + 6x^4$

44.

Multiplying Polynomials

45. $-x^2 + 3x$

48.

51. $x^2 - 3x - 4$

54.

57. $x^3 - 4x$

46.

49. $8t^2 + 33t + 27$

52.

55. $3x^2 + 15x + 18$

58.

47. $54r^4 + 48r^3 + 36r^2$

50.

53. $6y^2 - 27y + 30$

56.

59. $a^3 + 8a^2b - 14ab^2 - 12b^3$

60.

61. $4w^2 - 3w$

62.

Special Cases of Multiplying Polynomials

63. $100y^2 + 140y + 49$

66.

69. $x^2 - 81$

72.

75. $t^3 + 15t^2 + 75t + 125$

64.

67. $81a^2 - 108ab + 36b^2$

70.

73. $16r^{16} - 64$

76.

65. $r^2 - 16r + 64$

68.

71. $4 - 100y^2$

74.

More Exponent Rules

77. $9r^{24}$

80.

83. 1

86.

78.

81. $-\frac{t^{24}}{12}$

84.

87. $\frac{9}{64x^{16}}$

79. $20t^{14}$

82.

85. -1

88.

89. $\frac{x^9}{6}$

92.

93. 64

96.

99. $15x^3$

102.

105. $\frac{-56}{x^6}$

108.

111. $\frac{1}{t^{55}x^{20}}$

114.

90.

94.

97. $6x^5$

100.

103. $\frac{1}{t^{13}}$

106.

109. $81r^{19}$

112.

115. $\frac{16}{x^{26}}$

91. $\frac{x^6}{4y^8z^{14}}$

95. $\frac{17}{x^{12}}$

98.

101. $\frac{1}{r^{86}}$

104.

107. $-\frac{y^{39}}{125}$

110.

113. $\frac{t^{45}}{r^{50}}$

116.

6 Radical Expressions and Equations

6.1 Square and nth Root Properties

6.1.10 Exercises

3. Answer 1. 12

Answer 2. 11

Answer 3. 6

6.

9. Answer 1. 8

Answer 2. 80

Answer 3. 800

12.

13. 4.24

4.

7. Answer 1. 6

Answer 2. 0.6

Answer 3. 60

10.

14.

5. Answer 1. $\frac{3}{5}$

Answer 2. not a real number

8.

11. Answer 1. 11

Answer 2. 1.1

Answer 3. 0.11

Simplify Radical Expressions

15. $\frac{4}{7}$

18.

21.

not a real number or $0.916667i$

24.

16.

19. not a real number

22.

25. Answer 1. 4

Answer 2. 8

17. -8

20.

23. $\frac{-3}{11}$

26.

27. 5

28.

29. $\frac{1}{6}$

30.

31. $2\sqrt{2}$

32.

33. $14\sqrt{5}$

34.

35. $\sqrt{231}$

36.

Multiplying Square Root Expressions

37. $24\sqrt{33}$

38.

39. $225\sqrt{7}$

40.

41. $100\sqrt{2}$

42.

43. 24

44.

45. $\frac{\sqrt{2}}{7}$

46.

47. $\frac{6\sqrt{5}}{19}$

48.

Adding and Subtracting Square Root Expressions

49. $-(\sqrt{15})$ 50.
 51. $15\sqrt{11}$ 52.
 53. $7\sqrt{5}$ 54.
 55. $4\sqrt{7}$ 56.
 57. $7\sqrt{7} + 5\sqrt{2}$ 58.
 59. $5\sqrt{2} - 5\sqrt{3}$ 60.

Distributing with Square Roots

61. $\sqrt{38} + \sqrt{34}$ 62.
 63. $10\sqrt{11} + 32$ 64.
 65. $63 - 25\sqrt{7}$ 66.
 67. $7 + 2\sqrt{6}$ 68.
 69. $11 - 6\sqrt{2}$ 70.
 71. $20 - 10\sqrt{3}$ 72.
 73. $239 - 80\sqrt{7}$ 74.
 75. 87 76.
 77. -1 78.
 79. -95 80.

Higher Index Roots

- | | | |
|------------------------------|-------------------------------|-------------------------------|
| 81. 5 | 82. | 83. 2 |
| 84. | 85. 2 | 86. |
| 87. -2 | 88. | 89. not a real number |
| 90. | 91. -3 | 92. |
| 93. $2\sqrt[3]{2}$ | 94. | 95. $4\sqrt[3]{3}$ |
| 96. | 97. $2\sqrt[3]{10}$ | 98. |
| 99. $\frac{1}{4}\sqrt[3]{3}$ | 100. | 101. $\frac{3}{5}\sqrt[3]{7}$ |
| 102. | 103. $\frac{3}{5}\sqrt[3]{2}$ | 104. |

6.2 Rationalizing the Denominator**6.2.4 Exercises****Review and Warmup**

- | | | | |
|--------------------------|----|--------------------------|----|
| 1. $\frac{\sqrt{6}}{6}$ | 2. | 3. $\sqrt{7}$ | 4. |
| 5. $\frac{\sqrt{5}}{30}$ | 6. | 7. $\frac{\sqrt{7}}{21}$ | 8. |

Rationalizing the Denominator

- | | | | | | |
|----------------------------|-----|----------------------------|-----|-----------------------------|-----|
| 9. $\frac{3}{2}$ | 10. | 11. $\frac{\sqrt{6}}{6}$ | 12. | 13. $\frac{7\sqrt{10}}{10}$ | 14. |
| 15. $\frac{5\sqrt{2}}{16}$ | 16. | 17. $\frac{3\sqrt{10}}{5}$ | 18. | 19. $3\sqrt{6}$ | 20. |
| | | 21. $\frac{\sqrt{7}}{35}$ | 22. | | |

- | | | | |
|----------------------------|-----|----------------------------|-----|
| 23. $\frac{\sqrt{2}}{6}$ | 24. | 25. $\frac{\sqrt{7}}{3}$ | 26. |
| 27. $\frac{3\sqrt{2}}{2}$ | 28. | 29. $\frac{\sqrt{22}}{2}$ | 30. |
| 31. $\frac{6\sqrt{21}}{7}$ | 32. | 33. $\frac{4\sqrt{x}}{x}$ | 34. |
| 35. $\frac{\sqrt{10}}{2}$ | 36. | 37. $\frac{\sqrt{33}}{12}$ | 38. |

Rationalizing the Denominator Using the Difference of Squares Formula

- | | | | |
|--|-----|--|-----|
| 39. $\frac{49-7\sqrt{15}}{34}$ or $\frac{7(7-1\sqrt{15})}{34}$ | 40. | 41. $\frac{72-8\sqrt{22}}{59}$ or $\frac{8(9-1\sqrt{22})}{59}$ | 42. |
| 43. $\frac{24-6\sqrt{11}-4\sqrt{2}+\sqrt{22}}{-5}$ | 44. | 45. $\frac{72-9\sqrt{7}-8\sqrt{3}+\sqrt{21}}{-57}$ | 46. |

6.3 Radical Expressions and Rational Exponents

6.3.4 Exercises

Review and Warmup

- | | | | |
|----------------------|-----|-------------------------|-----|
| 1. x^{30} | 2. | 3. t^{33} | 4. |
| 5. $\frac{49x^4}{4}$ | 6. | 7. $-216y^{12}$ | 8. |
| 9. y^{10} | 10. | | |
| 11. $\frac{1}{r^6}$ | 12. | 13. $\frac{90}{t^{12}}$ | 14. |

Calculations

- | | | | |
|-------------------------|-----|--------------------|-----|
| 15. Answer 1. 3 | 16. | 17. Answer 1. 2 | 18. |
| Answer 2. DNE | | Answer 2. -2 | |
| Answer 3. -3 | | Answer 3. -2 | |
| 19. $\frac{1}{27}$ | 20. | 21. 27 | 22. |
| 23. 27 | 24. | 25. 4 | 26. |
| 27. Answer 1. 2 | 28. | 29. Answer 1. 2 | 30. |
| Answer 2. -2 | | Answer 2. DNE | |
| Answer 3. -2 | | Answer 3. -2 | |
| 31. $-\frac{3}{5}$ | 32. | 33. $-\frac{1}{4}$ | 34. |
| 35. 4.32675 | 36. | 37. 5.52877 | 38. |
| 39. Answer 1. 1.49831 | | 40. | |
| Answer 2. $\frac{3}{2}$ | | | |

Convert Radicals to Fractional Exponents

- | | | | |
|-----------------------|-----|----------------------------|-----|
| 41. $x^{\frac{1}{9}}$ | 42. | 43. $(4z+6)^{\frac{1}{3}}$ | 44. |
| 45. $r^{\frac{1}{6}}$ | 46. | 47. $n^{-\frac{3}{8}}$ | 48. |

Convert Fractional Exponents to Radicals

- | | | |
|---------------------|-----|---------------------|
| 49. $\sqrt[3]{c^2}$ | 50. | 51. $\sqrt[9]{y^5}$ |
|---------------------|-----|---------------------|

52.

53. $\sqrt[6]{15t^5}$

54.

55. $\sqrt[3]{m^2}$

56.

57. $\frac{1}{\sqrt[3]{b^3}}$

58.

59. $\sqrt[5]{2x^4}$

60.

Simplifying Expressions with Rational Exponents

61. $z^{\frac{2}{11}}$

62.

63. $2r^{\frac{2}{5}}$

64.

65. $3n^{-\frac{1}{2}}$

66.

67. $2c^{\frac{7}{5}}$

68.

69. $y^{\frac{1}{2}}$

70.

71. $t^{\frac{1}{6}}$

72.

73. $b^{\frac{9}{14}}$

74.

6.4 Solving Radical Equations**6.4.4 Exercises****Review and Warmup**

1. $\{2\}$

2.

3. $\{7\}$

4.

5. $\{7\}$

6.

7. $x = 3$ or $x = -1$

8.

9. $x = -5$ or $x = 4$

10.

11. $x = -10$ or $x = -3$

12.

Solving Radical Equations

13. $\{144\}$

14.

15. $\{32\}$

16.

17. $\{16\}$

18.

19. no real solutions

20.

21. $\{-9\}$

22.

23. 16

24.

25. no real solutions

26.

27. $\{32\}$

28.

29. $\{348\}$

30.

31. $\{\frac{31}{8}\}$

32.

33. $\{-113\}$

34.

Solving Radical Equations with Variables

35. $\sqrt{Z^2 - 1}^2$

36.

37. $\frac{1}{4\pi^2 C f^2}$

38.

Radical Equation Applications

39. 3 ft

40.

41. 5 cm

42.

43. 29.1805 ft

44.

Challenge

45. $\{\frac{1}{49}\}$

46.

6.5 Radical Expressions and Equations Chapter Review

6.5.5 Exercises

Square Root and nth Root

- | | | | |
|-------------------------------|-----|------------------------------|-----|
| 1. $\frac{1}{10}$ | 2. | 3. -4 | 4. |
| 5. 4 | 6. | 7. $5\sqrt{10}$ | 8. |
| 9. $891\sqrt{13}$ | 10. | 11. $\frac{\sqrt{35}}{2}$ | 12. |
| 13. $-(\sqrt{10})$ | 14. | 15. $9\sqrt{5}$ | 16. |
| 17. 2 | 18. | 19. -2 | 20. |
| 21. not a real number | 22. | 23. $2\sqrt[4]{9}$ | 24. |
| 25. $\frac{1}{2}\sqrt[3]{11}$ | 26. | 27. $\frac{2}{3}\sqrt[3]{5}$ | 28. |

Rationalizing the Denominator

- | | | | |
|---|-----|--|-----|
| 29. $\frac{\sqrt{7}}{21}$ | 30. | 31. $\frac{\sqrt{6}}{9}$ | 32. |
| 33. $\frac{48-6\sqrt{15}}{49}$ or $\frac{6(8-\sqrt{15})}{49}$ | 34. | 35. $\frac{39-13\sqrt{13}-3\sqrt{5}+\sqrt{65}}{4}$ | 36. |

Radical Expressions and Rational Exponents

- | | | | |
|------------------------|-----|----------------------------|-----|
| 37. $\frac{1}{25}$ | 38. | 39. 27 | 40. |
| 41. 25 | 42. | 43. 4 | 44. |
| 45. $b^{\frac{1}{5}}$ | 46. | 47. $(8x+7)^{\frac{1}{5}}$ | 48. |
| 49. $\sqrt[3]{t^2}$ | 50. | 51. $\sqrt[4]{m^5}$ | 52. |
| 53. $\sqrt[5]{5a^4}$ | 54. | 55. $c^{\frac{2}{11}}$ | 56. |
| 57. $2z^{\frac{2}{5}}$ | 58. | 59. $4r^{\frac{1}{5}}$ | 60. |
| 61. $n^{\frac{4}{3}}$ | 62. | | |

Solving Radical Equations

- | | | | |
|----------------|-----|----------|-----|
| 63. {7} | 64. | 65. 16 | 66. |
| 67. {121} | 68. | 69. {21} | 70. |
| 71. {3} | 72. | | |
| 73. 9 ft | 74. | | |
| 75. 3.24228 ft | 76. | | |

7 Solving Quadratic Equations

7.1 Solving Quadratic Equations by Using a Square Root

7.1.4 Exercises

Solving Quadratic Equations with the Square Root Property

1. $x = 5$ or $x = (-5)$

2.

3. $x = -\frac{1}{8}$ or $x = \frac{1}{8}$

4.

5. $x = 2\sqrt{3}$ or $x = -2\sqrt{3}$

6.

7. $x = \sqrt{67}$ or $x = -(\sqrt{67})$

8.

9. $x = 3$ or $x = -3$

10.

11. $x = -\frac{8}{3}$ or $x = \frac{8}{3}$

12.

13. $x = -\frac{11}{2}$ or $x = \frac{11}{2}$

14.

15. $x = \frac{\sqrt{413}}{7}$ or $x = \frac{-(\sqrt{413})}{7}$

16.

17. $x = \frac{-(\sqrt{35})}{7}$ or $x = \frac{\sqrt{35}}{7}$

18.

19. no real solutions

20.

21. $x = 2$ or $x = -4$

22.

23. $x = -\frac{15}{2}$ or $x = -\frac{1}{2}$

24.

25. $t = 0$ or $t = -2$

26.

27. $x = 10 + \sqrt{11}$ or $x = 10 - \sqrt{11}$

28.

29.

30.

$y = -2 + 3\sqrt{5}$ or $y = -2 - 3\sqrt{5}$

31. $r = 4 + 2\sqrt{3}$ or $r = 4 - 2\sqrt{3}$

32.

Pythagorean Theorem Applications

33. 100

34.

35. 3

36.

37. 8.30662

38.

39. $2\sqrt{74}$

40.

41. $2\sqrt{13}$

42.

43. Answer 1. 34.8

Answer 2. 14.5

44.

45. Answer 1. 9.1

Answer 2. 3.5

46.

Challenge

47. 3.60555

7.2 The Quadratic Formula

7.2.3 Exercises

Review and Warmup

- | | |
|---------------------|-----|
| 1. $-\frac{23}{48}$ | 2. |
| 3. 1 | 4. |
| 5. 176 | 6. |
| 7. Answer 1. 49 | 8. |
| Answer 2. 4 | |
| 9. $\frac{1}{10}$ | 10. |

Solve Quadratic Equations Using the Quadratic Formula

- | | | |
|--|--|--|
| 11. $x = \frac{-7-3\sqrt{5}}{2}$ or $x = \frac{-7+3\sqrt{5}}{2}$ | 12. | 13. $x = -\frac{5}{2}$ or $x = -\frac{3}{10}$ |
| 14. | 15. $x = \frac{1-\sqrt{5}}{2}$ or $x = \frac{1+\sqrt{5}}{2}$ | 16. |
| 17. $x = \frac{-3-3\sqrt{5}}{2}$ or $x = \frac{-3+3\sqrt{5}}{2}$ | 18. | 19. $x = \frac{-3-\sqrt{17}}{4}$ or $x = \frac{-3+\sqrt{17}}{4}$ |
| 20. | 21. $x = \frac{5-3\sqrt{5}}{4}$ or $x = \frac{5+3\sqrt{5}}{4}$ | 22. |
| 23. no real solutions | 24. | |

Solve Quadratic Equations Using an Appropriate Method

- | | | |
|--|--|---|
| 25. $x = 3$ or $x = -3$ | 26. | 27. $x = -\frac{9}{5}$ or $x = \frac{9}{5}$ |
| 28. | 29. $r = \frac{-(\sqrt{21})}{7}$ or $r = \frac{\sqrt{21}}{7}$ | 30. |
| 31. $x = -8$ or $x = 3$ | 32. | 33. $x = 17$ or $x = 1$ |
| 34. | 35. $x = \frac{-9-\sqrt{17}}{2}$ or $x = \frac{-9+\sqrt{17}}{2}$ | 36. |
| 37. $x = \frac{1-\sqrt{13}}{6}$ or $x = \frac{1+\sqrt{13}}{6}$ | 38. | 39. $r = -3$ or $r = -7$ |
| 40. | | |

Radical Equations That Give Rise to Quadratic Equations

- | | |
|-----------|-----|
| 41. {9} | 42. |
| 43. {4} | 44. |
| 45. {7} | 46. |
| 47. {100} | 48. |
| 49. {13} | 50. |
| 51. {2} | 52. |

Quadratic Formula Applications

- | | |
|--------------------|-----|
| 53. -7, 6 | 54. |
| 55. 10.2, -2.5 | 56. |
| 57. Answer 1. 8 cm | 58. |
| Answer 2. 14 cm | |
| 59. Answer 1. 5 in | 60. |
| Answer 2. 17 in | |

61. Answer 1. 145
 Answer 2. 220
 Answer 3. 110
 Answer 4. 290
 63. 3 ft
 65. 2.94457
 67. Answer 1. 0.111792
 Answer 2. 18.2556
 69. Answer 1. \$90.00
 Answer 2. \$250.00

71. $\frac{-n - \sqrt{n^2 - 4mp}}{2m}, \frac{-n + \sqrt{n^2 - 4mp}}{2m}$

7.3 Complex Solutions to Quadratic Equations

7.3.5 Exercises

Simplifying Square Roots with Negative Radicands

1. $i\sqrt{30}$
 4.
 2.
 5. $3i\sqrt{30}$
 3. $2i\sqrt{6}$
 6.

Quadratic Equations with Imaginary and Complex Solutions

7. $x = 10i$ or $x = (-10)i$
 10.
 13. $r = 5i\sqrt{2}$ or $r = (-5)i\sqrt{2}$
 16.
 19. $y = (-2) + i\sqrt{7}$ or $y = (-2) - i\sqrt{7}$
 8.
 11. $r = i\sqrt{6}$ or $r = (-i)\sqrt{6}$
 14.
 17. $x = (-1) + 2i$ or $x = (-1) - 2i$
 20.
 9. $y = 4i$ or $y = (-4)i$
 12.
 15. $t = (-(-10)) + 3i$ or $t = (-(-10)) - 3i$
 18.

7.4 Solving Equations in General

7.4.5 Exercises

1. $\{-11\}$
 4.
 7. $\{5, -5\}$
 10.
 13. $\{\frac{12}{7}, -\frac{12}{7}\}$
 16.
 19. $\{\frac{-3}{2} + \frac{3}{2}\sqrt{3}, \frac{-3}{2} - \frac{3}{2}\sqrt{3}\}$
 22.
 2. $\{\frac{3}{14}\}$
 8.
 11. $\{9, -9\}$
 14.
 17. $\{-5 + \frac{\sqrt{30}}{6}, -5 - \frac{\sqrt{30}}{6}\}$
 20.
 23. $\{\frac{3}{2} + \frac{1}{2}\sqrt{37}, \frac{3}{2} - \frac{1}{2}\sqrt{37}\}$
 3. $\{\frac{2}{11}\}$
 6.
 9. $\{1, 15\}$
 12.
 15. $\{\frac{\sqrt{6}}{3}, \frac{-(\sqrt{6})}{3}\}$
 18.
 21. $\{\frac{-2}{3} + \frac{1}{3}\sqrt{7}, \frac{-2}{3} - \frac{1}{3}\sqrt{7}\}$
 24.

25. $\left\{\frac{1}{10} + \frac{-1}{10}\sqrt{21}, \frac{1}{10} - \frac{-1}{10}\sqrt{21}\right\}$

28.

31. $\{\}$ or no real solutions

34.

26.

29. $\left\{\frac{-61}{2}\right\}$

32.

35. $\left\{\frac{64}{3} + \frac{16}{3}\sqrt{14}, \frac{64}{3} - \frac{16}{3}\sqrt{14}\right\}$

27. $\left\{\frac{-22}{3}\right\}$

30.

33. $\{\}$ or no real solutions

36.

Solve an Equation for a Variable

37. $b = \frac{A}{h}$

40.

43. $m = \frac{y-b}{x}$

46.

49. $r = \frac{c}{2\pi}$

52.

55. $h = \frac{V}{\pi r^2}$

58.

61. $d = vt$

64.

67. $v = \sqrt{ar}$

70.

38.

41. $b = \frac{2A}{h}$

44.

47. $h = x - \frac{y-k}{m}$

50.

53. $r = \sqrt{\frac{V}{\pi h}}$

56.

59. $s = \sqrt{\frac{S}{6}}$

62.

65. $m = \frac{F}{a}$

68.

39. $l = \frac{p}{2} - w$

42.

45. $b = y - mx$

48.

51. $s = \sqrt{A}$

54.

57. $s = \sqrt[3]{V}$

60.

63. $t = \frac{-v - \sqrt{v^2 - 2g(d-p)}}{g}, t = \frac{-v + \sqrt{v^2 - 2g(d-p)}}{g}$

66.

69. $l = g\left(\frac{T}{2\pi}\right)^2$

7.5 Solving Quadratic Equations Chapter Review**7.5.5 Exercises****Solving Quadratic Equations by Using a Square Root**

1. $x = 3\sqrt{3}$ or $x = -3\sqrt{3}$

5. $x = 0$ or $x = -12$

9. 12

11. Answer 1. 57

Answer 2. 30.4

2.

6.

3. $x = -\frac{3}{8}$ or $x = \frac{3}{8}$

7. $x = 10$ or $x = 8$

10.

12.

4.

8.

The Quadratic Formula

13. $x = -\frac{2}{7}$ or $x = -\frac{3}{4}$

16.

19. $x = 0$ or $x = 26$

22.

25. Answer 1. 0.59632

Answer 2. 13.6894

14.

17. no real solutions

20.

23. $x = \frac{9-\sqrt{5}}{2}$ or $x = \frac{9+\sqrt{5}}{2}$

26.

15. $x = \frac{-7-\sqrt{5}}{2}$ or $x = \frac{-7+\sqrt{5}}{2}$

18.

21. $x = -2$ or $x = 9$

24.

Complex Solutions to Quadratic Equations

27. $2i\sqrt{10}$ 28.
29. $y = i\sqrt{3}$ or $y = (-i)\sqrt{3}$ 30.
31. $r = (-4) + 4i$ or $r = (-4) - 4i$ 32.

Solving Equations in General

- | | | |
|------------------------------------|--------------------------|--|
| 33. {81} | 34. | 35. {4} |
| 36. | 37. $x = 3$ or $x = -8$ | 38. |
| 39. no solution | 40. | 41. |
| 42. | 43. $x = -1$ or $x = -3$ | $x = -4 - \sqrt{13}$ or $x = -4 + \sqrt{13}$ |
| 45. {20} | 46. | 44. |
| 48. | 49. no real solutions | 47. {96} |
| 51. $x = -\frac{7}{5}$ or $x = -7$ | 52. | 50. |
| 54. | | 53. {10} |

8 Quantities in the Physical World

8.1 Scientific Notation

8.1.6 Exercises

Converting To and From Scientific Notation

- | | | | |
|-----------------------|----------|-----------------------|----|
| 1. 1×10^5 | 2. | 3. 3×10^2 | 4. |
| 5. 5×10^{-3} | 6. | 7. 7×10^{-2} | 8. |
| 9. 900 | 10. | 11. 2020 | |
| 12. | 13. 4.01 | 14. | |
| 15. 0.0006 | 16. | 17. 0.0008 | |
| 18. | | | |

Arithmetic with Scientific Notation

- | | | |
|---------------------------|--------------------------|------------------------|
| 19. 6.3×10^5 | 20. | 21. 2.7×10^7 |
| 22. | 23. 1.5×10^{11} | 24. |
| 25. 6×10^1 | 26. | 27. 8×10^2 |
| 28. | 29. 3×10^7 | 30. |
| 31. 5×10^4 | 32. | 33. 8×10^{-8} |
| 34. | 35. 2×10^{-7} | 36. |
| 37. 6.25×10^{22} | 38. | 39. 8×10^{24} |
| 40. | 41. 2.7×10^{31} | 42. |

8.2 Unit Conversion

8.2.6 Exercises

Review and Warmup

- | | | |
|--------------------|-------------------|--------------------|
| 1. $\frac{25}{72}$ | 2. | 3. $\frac{91}{33}$ |
| 4. | 5. $\frac{10}{7}$ | 6. |

Unit Conversions

- | | |
|----------------|-----|
| 7. 468 s | 8. |
| 9. 405120 acre | 10. |

- | | |
|--|-----|
| 11. 0.0497 g | 12. |
| 13. 0.000342 ha | 14. |
| 15. 0.004226 gal | 16. |
| 17. 2.912×10^6 oz | 18. |
| 19. 7.95×10^{-5} hm | 20. |
| 21. 2.32797×10^{-5} mi ² | 22. |
| 23. 58.9202 yd ³ | 24. |
| 25. 229.5 ft ³ | 26. |
| 27. 63.0902 cm ³ | 28. |
| 29. 7.85×10^{11} m ³ | 30. |
| 31. 37020.1 $\frac{\text{m}}{\text{s}}$ | 32. |
| 33. 0.0142857 $\frac{\text{mi}^2}{\text{d}}$ | 34. |
| 35. 0.0035 $\frac{\text{L}}{\text{h}}$ | 36. |
| 37. 9857.14 $\frac{\text{lb}}{\text{d}}$ | 38. |
| 39. 48906.2 $\frac{\text{b}}{\text{d}}$ | 40. |
| 41. 1357.12 $\frac{\text{lb}}{\text{gal}}$ | 42. |

Applications

- | | | |
|-----------------------------|--------------|-----------------|
| 43. 13.7778 yd ² | 44. | 45. 10.3038 gal |
| 46. | 47. 4.8819 c | 48. |
| 49. 11.1667 mi | 50. | 51. 20.16 kg |
| 52. | 53. 68040 MB | 54. |

8.3 Geometry Formulas**8.3.4 Exercises****Perimeter and Area**

- | | | |
|--------------------------------|----------------------------------|----------------------------------|
| 1. Answer 1. 48 m | 2. | |
| Answer 2. 128 m ² | | |
| 3. $\frac{19}{20}$ m | 4. | 5. $\frac{9}{35}$ m ² |
| 6. | 7. Answer 1. 197.2 in | 8. |
| 9. Answer 1. 20 cm | Answer 2. 2018.4 in ² | 11. Answer 1. 44 ft |
| Answer 2. 25 cm ² | 10. | Answer 2. 76 ft ² |
| 12. | 13. Answer 1. 56 cm | 14. |
| 15. Answer 1. 65 m | Answer 2. 84 cm ² | 17. $1\frac{23}{40}$ |
| Answer 2. 112.5 m ² | 16. | 20. |
| 18. | 19. 0.805 m ² | 23. Answer 1. 42 m |
| 21. Answer 1. 69 ft | 22. | Answer 2. 64 m ² |
| Answer 2. 299 ft ² | | |

24.

25. Answer 1. 56 m

26.

Answer 2. 92 m^2 27. 90 m^2

28.

29. 4050 in^2

30.

31. Answer 1. $12\pi \text{ m}$

32.

Answer 2. 37.7 m

Answer 3. $36\pi \text{ m}^2$ Answer 4. 113.1 m^2 33. Answer 1. $16\pi \text{ m}$

34.

Answer 2. 50.27 m

Answer 3. $64\pi \text{ m}^2$ Answer 4. 201.06 m^2

35. Answer 1. 45.9911 cm

36.

Answer 2. 146.969 cm^2 **Volume**37. 1350 in^3

38.

39. 756 in^3

40.

41. 343 cm^3

42.

43. Answer 1. $80\pi \text{ m}^3$

44.

45. Answer 1. $192\pi \text{ m}^3$ Answer 2. 251.33 m^3 Answer 2. 603.19 m^3

46.

47. Answer 1. $144\pi \text{ ft}^3$

48.

Answer 2. 452.389 ft^3 49. 71094 in^3

50.

51. Answer 1. $P = 2(l + w)$ Answer 2. $A = lw$ Answer 3. $A = 0.5bh$ Answer 4. $c = \pi d$ or $c = 2\pi r$ Answer 5. $A = \pi r^2$ Answer 6. $V = wdh$ Answer 7. $V = \pi r^2 h$ Answer 8. $V = Bh$ **8.4 Geometry Applications****8.4.3 Exercises**

1. Answer 1. 4 mm

2.

Answer 2. 2 mm

3. Answer 1. 11.46 cm

4.

Answer 2. 5.73 cm

5. Answer 1. 12 mm

6.

Answer 2. 6 mm

- | | |
|-----------------------|-----|
| 7. Answer 1. 14.32 cm | 8. |
| Answer 2. 7.16 cm | |
| 9. 10 m | 10. |
| 11. 21 mm | 12. |
| 13. 29 ft | 14. |
| 15. 13 m | 16. |
| 17. 64.8 ft | 18. |
| 19. 19 ft | 20. |

8.5 Quantities in the Physical World Chapter Review

8.5.4 Exercises

Scientific Notation

- | | | |
|-------------------------|-----------|--------|
| 1. 3.5×10^2 | 2. | |
| 3. 5.5×10^{-3} | 4. | |
| 5. 75100 | 6. | 7. 9.5 |
| 8. | 9. 0.0025 | 10. |
| 11. 3.5×10^6 | 12. | |
| 13. 9×10^4 | 14. | |

Unit Conversion

- | | | |
|---|-----|-------------|
| 15. 633 tsp | 16. | |
| 17. 9500 ms | 18. | |
| 19. 813.528 cm | 20. | |
| 21. 7.44001 in^2 | 22. | |
| 23. $0.528 \frac{\text{m}}{\text{ms}}$ | 24. | |
| 25. $1.52 \times 10^{-5} \frac{\text{lb}}{\text{ns}}$ | 26. | |
| 27. 11.8889 yd^2 | 28. | 29. 7.15 mi |
| 30. | | |

Geometry

- | | | |
|----------------------------------|---------------------|-----------------------------|
| 31. Answer 1. 48 m | 32. | |
| Answer 2. 128 m^2 | | |
| 33. $\frac{9}{35} \text{ m}^2$ | 34. | 35. Answer 1. 44 ft |
| 36. | 37. $4\frac{7}{27}$ | Answer 2. 76 ft^2 |
| 39. Answer 1. 42 m | 40. | 38. |
| Answer 2. 64 m^2 | | |
| 41. 17280 in^2 | 42. | |
| 43. Answer 1. 45.9911 cm | 44. | 45. 27 cm^3 |
| Answer 2. 146.969 cm^2 | | |

46.

49. Answer 1. $P = 2(l + w)$

Answer 2. $A = lw$

Answer 3. $A = 0.5bh$

Answer 4. $c = \pi d$ or $c = 2\pi r$

Answer 5. $A = \pi r^2$

Answer 6. $V = wdh$

Answer 7. $V = \pi r^2 h$

Answer 8. $V = Bh$

50.

52.

54.

56.

47. Answer 1. $45\pi \text{ ft}^3$

Answer 2. 141.372 ft^3

48.

51. Answer 1. 14.96 cm

Answer 2. 7.48 cm

53. 2 m

55. 13 m

57. 15 ft

9 Topics in Graphing

9.1 Review of Graphing

9.1.4 Exercises

Identifying Coordinates

1. Answer 1. $(6, 4)$

2.

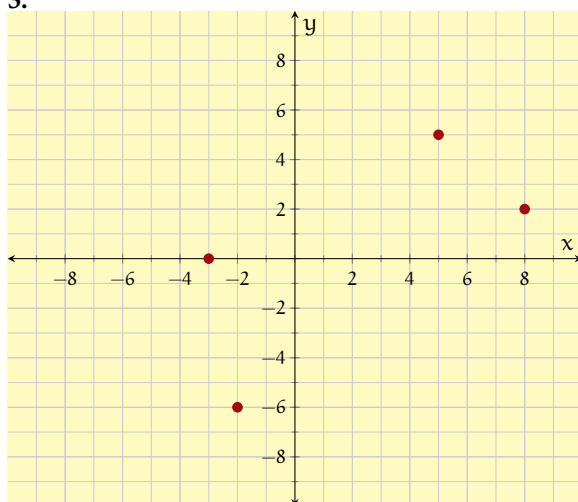
Answer 2. $(-7, 0)$

Answer 3. $(0, -4)$

Answer 4. $(7, 0)$

Plotting Points

3.



4.

Tables for Equations

5. $-1; -4; 0; 0; 1; 4; 2; 8; 3; 12$

6.

7. $-1; -3; 0; 3; 1; 9; 2; 15; 3; 21$

8.

9. $-3; 0; 0; 10; 3; 20; 6; 30; 9; 40$

10.

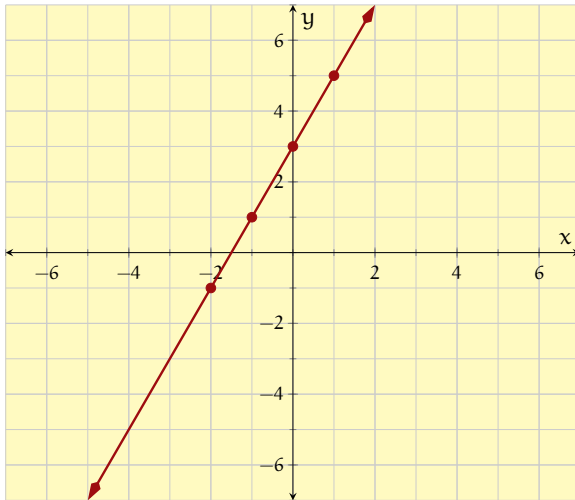
11. $-8; 3; 0; -6; 8; -15; 16; -24; 24; -33$

12.

Graphs of Equations

13.

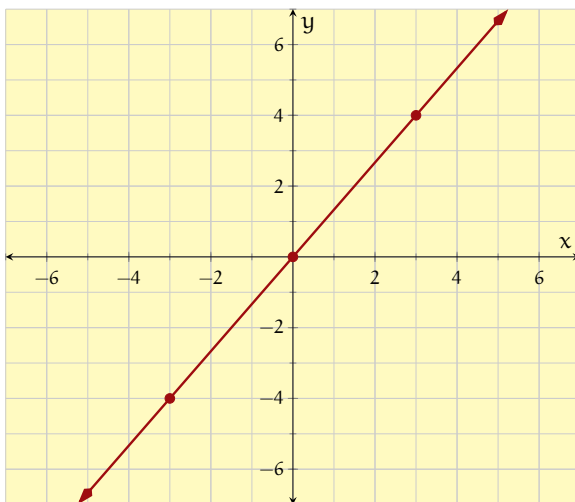
x	$y = 2x + 3$	Point
-2	-1	$(-2, -1)$
-1	1	$(-1, 1)$
0	3	$(0, 3)$
1	5	$(1, 5)$
2	7	$(2, 7)$



14.

15.

x	$y = \frac{4}{3}x$	Point
-3	-4	$(-3, -4)$
0	0	$(0, 0)$
3	4	$(3, 4)$

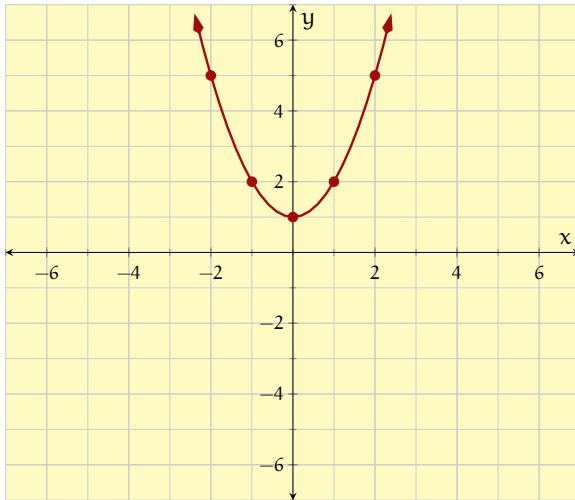


16.

17.

x	$y = x^2 + 1$	Point
-2	5	$(-2, 5)$
-1	2	$(-1, 2)$
0	1	$(0, 1)$
1	2	$(1, 2)$
2	5	$(2, 5)$

18.

**Lines and Intercepts**

19. Answer 1. 0

Answer 2. 5

Answer 3. $(0, 5)$

Answer 4. 6

Answer 5. 0

Answer 6. $(6, 0)$

20.

21. Answer 1. 0

Answer 2. 6

Answer 3. $(0, 6)$

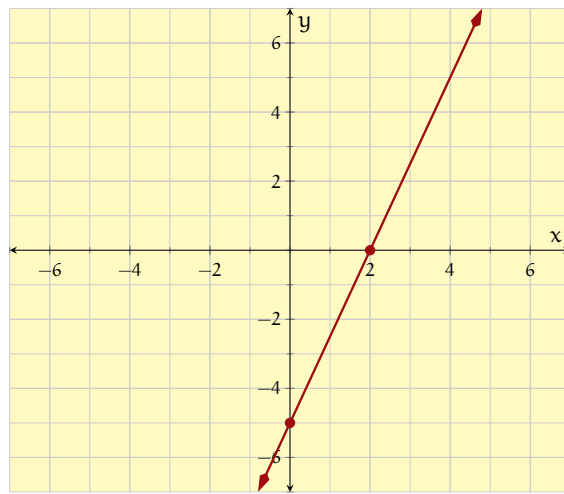
Answer 4. -7

Answer 5. 0

Answer 6. $(-7, 0)$

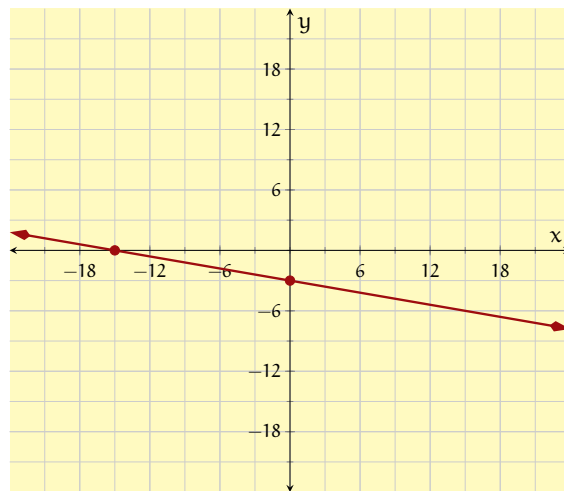
22.

23. x-intercept: $(2, 0)$ y-intercept: $(0, -5)$



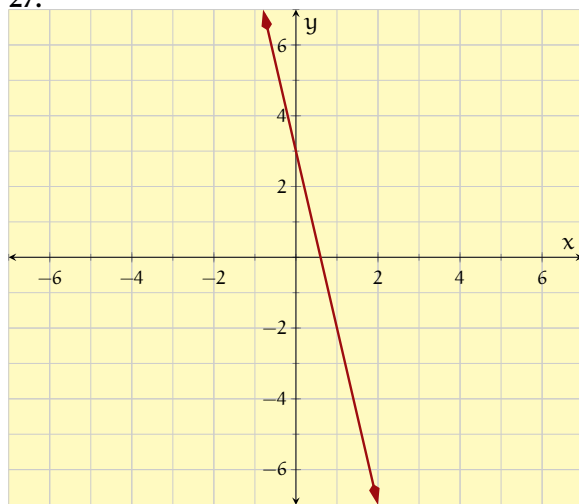
24.

25. x-intercept: $(-15, 0)$
y-intercept: $(0, -3)$



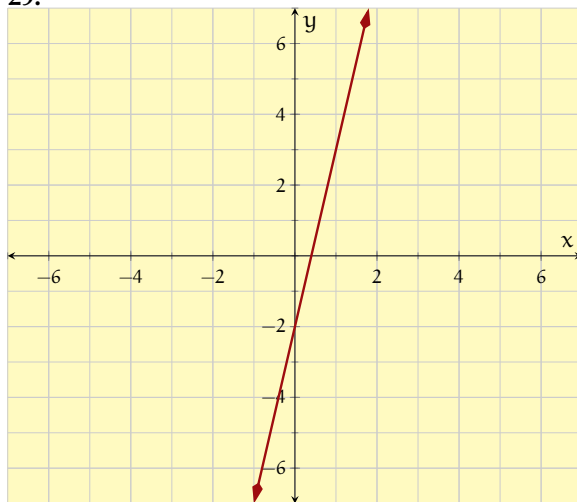
26.

27.



28.

29.



30.

9.2 Key Features of Quadratic Graphs

9.2.6 Exercises

Review and Warmup

1. Answer 1. 4

2.

Answer 2. $(-2, 4)$

Answer 3. 3

Answer 4. $(-1, 3)$

Answer 5. 2

Answer 6. $(0, 2)$

Answer 7. 1

Answer 8. $(1, 1)$

Answer 9. 0

Answer 10. $(2, 0)$ 3. Answer 1. -9

4.

Answer 2. $(-20, -9)$ Answer 3. -6 Answer 4. $(-10, -6)$ Answer 5. -3 Answer 6. $(0, -3)$

Answer 7. 0

Answer 8. $(10, 0)$

Answer 9. 3

Answer 10. $(20, 3)$

5. 3

6.

7. 176

8.

Algebraically Determining the Vertex and Axis of Symmetry of Quadratic Equations

9. Answer 1. $x = -2$

Answer 2. $(-2, -25)$

12.

15. Answer 1. $x = -2$

Answer 2. $(-2, -8)$

18.

21. Answer 1. $x = -0.5$

Answer 2. $(-0.5, -4)$

24.

27. Answer 1. $x = -2$

Answer 2. $(-2, -2)$

10.

13. Answer 1. $x = 1$

Answer 2. $(1, -1)$

16.

19. Answer 1. $x = \frac{3}{2}$

Answer 2. $(\frac{3}{2}, 6)$

22.

25. Answer 1. $x = 0$

Answer 2. $(-0, 2)$

28.

11. Answer 1. $x = 5$

Answer 2. $(5, 104)$

14.

17. Answer 1. $x = 0$

Answer 2. $(0, 5)$

20.

23. Answer 1. $x = 0$

Answer 2. $(-0, 0)$

26.

Finding Maximum and Minimum Values for Applications of Quadratic Equations

45. Answer 1. $-2.5, 2.5$

Answer 2. -6.25

46.

47. Answer 1. $0.5, -2$

Answer 2. -1

48.

49. Answer 1. 235 ft

Answer 2. 117.5 ft

Answer 3. 27612.5 ft^2

50.

51. Answer 1. 245 ft

Answer 2. 122.5 ft

Answer 3. 30012.5 ft^2

52.

53. Answer 1. 50 ft

Answer 2. 37.5 ft

Answer 3. 1875 ft^2

54.

55. Answer 1. 33.6 ft

Answer 2. 21 ft

Answer 3. 705.6 ft^2

56.

57. Answer 1. \$54,675.00

Answer 2. \$405.00

Answer 3. \$225.00

Answer 4. \$585.00

58.

9.3 Graphing Quadratic Expressions

9.3.6 Exercises

Review and Warmup

1. $x = -2$ or $x = -8$

4.

7. $x = \frac{\sqrt{1927}}{41}$ or $x = \frac{-(\sqrt{1927})}{41}$

10.

2.

5. $x = -1$ or $x = 1$

8.

11. no real solutions

3. $x = 4$

6.

9. $x = \frac{4-2\sqrt{7}}{3}$ or $x = \frac{4+2\sqrt{7}}{3}$

12.

Finding the Intercepts of Quadratic Equations Algebraically

13. Answer 1. $(0, 3)$

Answer 2. $(-1, 0), (-3, 0)$

16.

19. Answer 1. $(0, 16)$

Answer 2. $(-4, 0)$

22.

25. Answer 1. $(0, 6)$

Answer 2.

$(-0.837722, 0), (-7.16228, 0)$

28.

31. Answer 1. $(0, -7)$

Answer 2. $(-1.75, 0), (-1, 0)$

14.

17. Answer 1. $(0, 0)$

Answer 2. $(0, 0), (4, 0)$

20.

23. Answer 1. $(0, 6)$

Answer 2. DNE

26.

29. Answer 1. $(0, 1)$

Answer 2. $(-0.5, 0)$

32.

15. Answer 1. $(0, -4)$

Answer 2. $(2, 0), (-2, 0)$

18.

21. Answer 1. $(0, 4)$

Answer 2. DNE

24.

27. Answer 1. $(0, 10)$

Answer 2.

$(-1.55051, 0), (-6.44949, 0)$

30.

Applications of Quadratic Equations

53. Answer 1. 17 s

Answer 2. 4624 ft

Answer 3. 34 s

Answer 4. 4224 ft

Answer 5. 9 s

Answer 6. 25 s

54.

55. Answer 1. 28 s

Answer 2. 4041.6 m

Answer 3. 56.7196 s

Answer 4. 3728 m

Answer 5. 14 s

Answer 6. 42 s

56.

57. will

58.

59. will

60.

61. Answer 1. 0.51289

Answer 2. 19.8953

62.

63. Answer 1. \$120.00

Answer 2. \$360.00

64.

Challenge65. Answer 1. $\left(\frac{-n-\sqrt{n^2-4p}}{2}, 0\right), \left(\frac{-n+\sqrt{n^2-4p}}{2}, 0\right)$ Answer 2. $(0, p)$ Answer 3. $\left(\frac{-n}{2}, \frac{4p-n^2}{4}\right)$ **9.4 Graphically Solving Equations and Inequalities****9.4.4 Exercises****Points of Intersection**

- | | |
|--------------|----|
| 1. two times | 2. |
| 3. one time | 4. |
| 5. two times | 6. |
| 7. two times | 8. |

Solving Equations and Inequalities Graphically

- | | |
|--|-----|
| 9. Answer 1. $(-6, 5), (2, 5)$ | 10. |
| Answer 2. $\{-6, 2\}$ | |
| Answer 3. $(-\infty, -6) \cup (2, \infty)$ | |
| 11. Answer 1. $(-2.5, -5), (4, -5)$ | 12. |
| Answer 2. $\{-2.5, 4\}$ | |
| Answer 3. $(-2.5, 4)$ | |
| 13. Answer 1. $(-2, 3), (2, -1)$ | 14. |
| Answer 2. $\{-2, 2\}$ | |
| Answer 3. $(-\infty, -2) \cup (2, \infty)$ | |
| 15. Answer 1. $(-2, -2), (0, 0), (2, 2)$ | 16. |
| Answer 2. $\{-2, 0, 2\}$ | |
| Answer 3. $(-2, 0) \cup (2, \infty)$ | |
| 17. Answer 1. $(-3, 1), (5, 3)$ | 18. |
| Answer 2. $\{-3, 5\}$ | |
| Answer 3. $(-3, 5)$ | |
| 19. Answer 1. $(-2, -2), (0, 0)$ | 20. |
| Answer 2. $\{-2, 0\}$ | |
| Answer 3. $(-\infty, -2) \cup (0, \infty)$ | |

9.5 Topics in Graphing Chapter Review

9.5.5 Exercises

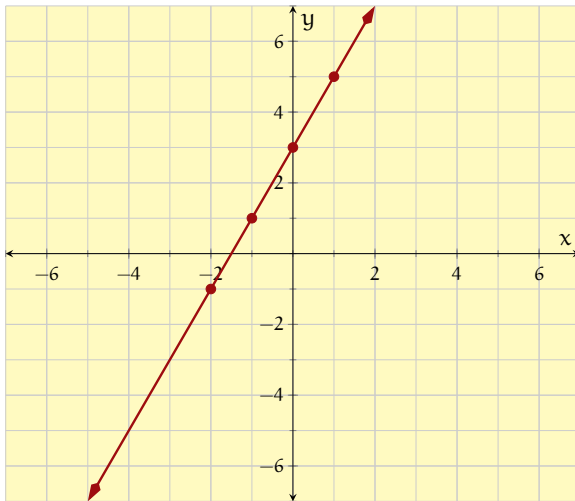
Review of Graphing

1. $-1; 9; 0; 0; 1; -9; 2; -18; 3; -27$ 2.

3. $-3; -9; 0; 1; 3; 11; 6; 21; 9; 31$ 4.

5. 6.

x	$y = 2x + 3$	Point
-2	-1	$(-2, -1)$
-1	1	$(-1, 1)$
0	3	$(0, 3)$
1	5	$(1, 5)$
2	7	$(2, 7)$



7. Answer 1. 0

Answer 2. -24

Answer 3. $(0, -24)$

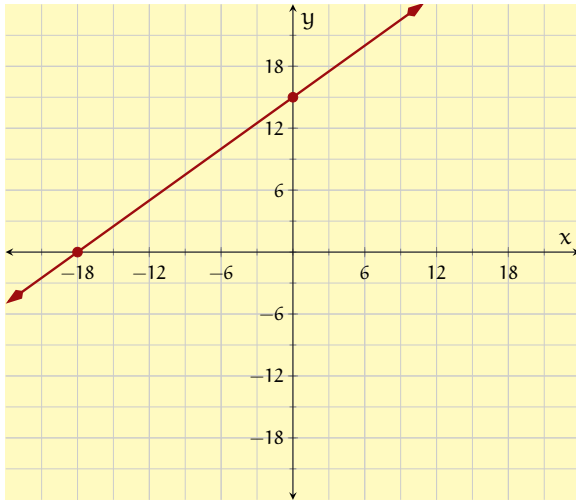
Answer 4. -21

Answer 5. 0

Answer 6. $(-21, 0)$

8.

9. x-intercept: $(-18, 0)$
y-intercept: $(0, 15)$



10.

Key Features of Quadratic Graphs

11. Answer 1. $x = 5$
Answer 2. $(5, -122)$

14.

17. Answer 1. $x = -2.5$
Answer 2. $(-2.5, -14.5)$

20.

29. Answer 1. $-2, 2$
Answer 2. -4

30.

12.

15. Answer 1. $x = 0$
Answer 2. $(0, 2)$

18.

13. Answer 1. $x = 3$
Answer 2. $(3, 8)$

16.

19. Answer 1. $x = 0$
Answer 2. $(-0, -4)$

Graphing Quadratic Equations

31. Answer 1. $(0, -8)$
Answer 2. $(-2, 0), (4, 0)$

33. Answer 1. $(0, 9)$
Answer 2. $(-3, 0)$

35. Answer 1. $(0, 5)$
Answer 2. $(-0.683375, 0), (-7.31662, 0)$

37. Answer 1. $(0, 18)$
Answer 2. $(1.8, 0), (-2, 0)$

49. Answer 1. 12 s
Answer 2. 2304 ft

Answer 3. 24 s

Answer 4. 1008 ft

Answer 5. 2 s

Answer 6. 22 s

32.

34.

36.

38.

50.

51. Answer 1. 0.754091

Answer 2. 13.5316

52.

Graphically Solving Equations and Inequalities

53. two times

54.

55. zero times

56.

57. Answer 1. $(-6, 5), (2, 5)$

58.

Answer 2. $\{-6, 2\}$

Answer 3. $(-\infty, -6) \cup (2, \infty)$

59. Answer 1. $(-2, 3), (2, -1)$

60.

Answer 2. $\{-2, 2\}$

Answer 3. $(-\infty, -2) \cup (2, \infty)$

61. Answer 1. $(-3, 1), (5, 3)$

62.

Answer 2. $\{-3, 5\}$

Answer 3. $(-3, 5)$

III Preparation for College Algebra

10 Factoring

10.1 Factoring Out the Common Factor

10.1.7 Exercises

Review and Warmup

- | | | | |
|-------------------|----|--------------------|----|
| 1. $-4x^2 + 8x$ | 2. | 3. $-54x^2 + 54x$ | 4. |
| 5. $6x^3 + 48x^2$ | 6. | 7. $80t^4 - 50t^3$ | 8. |

Identifying Common Factors

- | | | |
|-----------------------------|-----------------------------|-----------------------|
| 9. 4 or -4 | 10. | 11. $7y$ or $-(7y)$ |
| 12. | 13. $10r^3$ or $-10r^3$ | 14. |
| 15. $3t^{15}$ or $-3t^{15}$ | 16. | 17. $6x^2$ or $-6x^2$ |
| 18. | 19. $5x^4y^7$ or $-5x^4y^7$ | 20. |

Factoring out the Common Factor

- | | |
|-------------------------------------|-----|
| 21. $3(r + 1)$ | 22. |
| 23. $5(t - 1)$ | 24. |
| 25. $-8(t + 1)$ | 26. |
| 27. $2(x - 9)$ | 28. |
| 29. $4(3y^2 + 8)$ | 30. |
| 31. $9(2r^2 + r + 8)$ | 32. |
| 33. $4t^2(8t^2 - 3t + 6)$ | 34. |
| 35. $5x^3(4x^2 - 7x + 9)$ | 36. |
| 37. $4y(7 - 5y + 5y^2)$ | 38. |
| 39. prime | 40. |
| 41. $8y(x + 1)$ | 42. |
| 43. $10y^5(x^{11} + 6)$ | 44. |
| 45. $3x^3y^9(2x^2 - 6x + 7)$ | 46. |
| 47. $5x^3y^6z^3(8x^2z^2 - 2xz + 5)$ | 48. |

10.2 Factoring by Grouping

10.2.4 Exercises

Review and Warmup

1. $-5(t + 1)$

2.

3. $7(x + 2)$

4.

5. $10(3y^2 - 10)$

6.

Factoring out Common Polynomials

7. $(r + 4)(r - 6)$

8.

9. $(x + 7)(y + 9)$

10.

11. $(2x - 9)(x + y)$

12.

13. $(3y^4 + 1)(4y + 9)$

14.

15. $6r^2(r + 10)(2r^2 + r + 10)$

16.

Factoring by Grouping

17. $(t + 9)(t + 8)$

18.

19. $(t + 4)(t + 2)$

20.

21. $(x^2 + 7)(x + 5)$

22.

23. $(y^2 + 2)(y - 7)$

24.

25. $(x + 4)(y + 7)$

26.

27. $(x - 3)(y - 9)$

28.

29. $(2x + 9y)(x + 2y)$

30.

31. $(4x + 9y)(x + 9y)$

32.

33. $(x^3 - 6)(1 - 7y)$

34.

35. $(x^3 + 6)(1 + 8y)$

36.

37. $5t^2(t + 2)(2t^2 - 3t + 5)$

38.

10.3 Factoring Trinomials with Leading Coefficient One

10.3.7 Exercises

Review and Warmup

1. $y^2 + 15y + 50$

2.

3. $r^2 + 5r - 24$

4.

5. $t^2 - 14t + 40$

6.

7. $3x^2 + 15x + 18$

8.

9. $2y^2 - 26y + 60$

10.

Factoring Trinomials with Leading Coefficient One

11. $(r + 10)(r + 2)$

12.

13. $(r + 3)(r + 10)$

14.

15. $(t + 6)(t - 3)$

16.

17. $(x + 9)(x - 7)$

18.

19. $(y - 2)(y - 5)$

20.

21. $(r - 5)(r - 3)$

22.

23. $(t + 8)(t + 2)$
 26.
 29. $(r + 7)(r - 4)$
 32.
 35. prime
 38.
 41. $(t + 7)(t + 7)$
 44.
 47. $2(r - 5)(r + 4)$
 50.
 53. $3(x - 4)(x - 1)$
 56.
 59. $10t^5(t - 3)(t + 1)$
 62.
 65. $3y^5(y - 3)(y - 1)$
 68.
 71. $(x + 10r)(x + 2r)$
 74.
 77. $(t + 8x)(t + 8x)$
 80.
 83. $3y(x + 3)(x + 2)$
 86.
 89. $3xy(x + 1)(x + 7)$
 92.
 95. $(tx + 1)(tx + 5)$
 98.
 101. $6(yr + 2)(yr + 1)$
 104.
 107. $(a + b)(x + 6)(x + 2)$
24.
 27. $(y + 4)(y - 10)$
 30.
 33. $(t - 4)(t - 3)$
 36.
 39. $(r + 3)(r + 3)$
 42.
 45. $(y - 2)(y - 2)$
 48.
 51. $10(t - 1)(t - 2)$
 54.
 57. $3r^4(r + 1)(r + 7)$
 60.
 63. $2y^5(y - 1)(y - 3)$
 66.
 69. $-(t - 8)(t + 3)$
 72.
 75. $(r - 4t)(r - 3t)$
 78.
 81. $4(y + 4)(y + 1)$
 84.
 87. $2y(x - 10)(x - 1)$
 90.
 93. $(r + 0.5)(r + 0.4)$
 96.
 99. $(yt - 1)(yt - 7)$
 102.
 105. $6y(xy - 1)(xy - 2)$
25. $(x + 1)(x + 10)$
 28.
 31. $(r - 1)(r - 5)$
 34.
 37. prime
 40.
 43. $(x - 10)(x - 10)$
 46.
 49. $10(r - 1)(r + 1)$
 52.
 55. $2y^4(y + 1)(y + 9)$
 58.
 61. $3x^8(x - 2)(x + 2)$
 64.
 67. $-(r - 5)(r + 9)$
 70.
 73. $(y + 2t)(y - 5t)$
 76.
 79. $(x - 6y)(x - 6y)$
 82.
 85. $7b(a - 2)(a + 1)$
 88.
 91. $x^2(y - 4z)(y + 5z)$
 94.
 97. $(xt - 6)(xt + 4)$
 100.
 103. $7(rt - 1)(rt + 1)$
 106.
 108.

Challenge

109. 11, -11, 7, -7

10.4 Factoring Trinomials with a Nontrivial Leading Coefficient**10.4.4 Exercises****Review and Warmup**

1. $8y^2 + 56y + 90$
 4.
 7. $6x^5 + 18x^3 + 9x^2 + 27$
2.
 5. $3t^2 + 17t - 90$
 8.
3. $18r^2 - 72r + 64$
 6.

Factoring Trinomials with a Nontrivial Leading Coefficient

- | | | |
|--|---------------------------|---------------------------|
| 9. $(5y + 1)(y + 1)$ | 10. | 11. $(2r - 3)(r + 7)$ |
| 12. | 13. $(2t - 3)(t - 5)$ | 14. |
| 15. prime | 16. | 17. $(4x + 9)(x + 1)$ |
| 18. | 19. $(4y + 1)(y - 3)$ | 20. |
| 21. $(6r - 7)(r - 1)$ | 22. | 23. $(3t + 2)(2t + 5)$ |
| 24. | 25. $(2x + 3)(5x - 8)$ | 26. |
| 27. $(3y - 1)(2y - 9)$ | 28. | 29. $9(2r + 1)(r + 1)$ |
| 30. | 31. $7(5t - 1)(t + 1)$ | 32. |
| 33. $2(2x - 1)(x - 6)$ | 34. | 35. $2x^7(2x + 7)(x + 1)$ |
| 36. | 37. $8y^4(2y - 3)(y + 1)$ | 38. |
| 39. $2r^5(3r - 1)(r - 1)$ | 40. | 41. $(3tr + 4)(tr + 3)$ |
| 42. | 43. $(2xt - 1)(xt + 2)$ | 44. |
| 45. $(5yx - 3)(yx - 4)$ | 46. | 47. $(3r + x)(r + 4x)$ |
| 48. | 49. $(3t + y)(t - 9y)$ | 50. |
| 51. $(3x - 8r)(x - r)$ | 52. | 53. $(4x + 7y)(x + y)$ |
| 54. | 55. $(8y + 7t)(y - 3t)$ | 56. |
| 57. $(6r - x)(r - 5x)$ | 58. | 59. $(3t + 4y)(4t + 3y)$ |
| 60. | 61. $(3x + 4r)(3x - 7r)$ | 62. |
| 63. $(2y - t)(2y - 7t)$ | 64. | 65. $9(2ry + 1)(ry + 1)$ |
| 66. | 67. $7(3tr - 4)(tr + 1)$ | 68. |
| 69. $2x^7(3xt - 4)(xt - 3)$ | 70. | 71. $2(5x + 6y)(x + y)$ |
| 72. | 73. $2(3a - b)(a + 2b)$ | 74. |
| 75. $2(5x - 2y)(x - 2y)$ | 76. | 77. $2y(5x + y)(x + 3y)$ |
| 78. | | |
| 79. $4(y + 6)(3x + 4)(x + 1)$ | 80. | |
| 81. $3(y + 9)(3x + 1)(x + 2)$ | 82. | |
| 83. Answer 1. $(3x + 1)(x + 6)$ | 84. | |
| Answer 2. $(3y - 20)(y - 1)$ | | |

Challenge

85. 25, -25, 14, -14, 11, -11, 10, -10

10.5 Factoring Special Polynomials**10.5.5 Exercises****Review and Warmup**

- | | | |
|-----------------------|------------------------|---------------------|
| 1. $100x^2 + 20x + 1$ | 2. | 3. $y^2 - 16y + 64$ |
| 4. | 5. $r^{16} + 2r^8 + 1$ | 6. |
| 7. $t^2 - 100$ | 8. | 9. $4x^2 - 4$ |

10.

11. $16y^{18} - 49$

12.

Factoring13. $(r + 10)(r - 10)$

16.

19. $(8xr + 7)(8xr - 7)$

22.

25. $(t^2 + 8)(t^2 - 8)$

28.

31. $(7x^2 + 8y^2)(7x^2 - 8y^2)$

34.

37. $(x - 6)(x - 6)$

40.

43. $(8ty - 1)(8ty - 1)$

46.

49. $(3r + 4y)(3r + 4y)$

52.

55. $8(x + 3)(x - 3)$

58.

61. $3(1 + t)(1 - t)$

64.

67. $4(4r - 1)(4r - 1)$

70.

73. $3x^2(2x + 1)(2x + 1)$

76.

79. prime

82.

14.

17. $(ty + 10)(ty - 10)$

20.

23. $(7 + 4r)(7 - 4r)$

26.

29. $(y^7 + 10)(y^7 - 10)$

32.

35. $(t + 2)(t + 2)$

38.

41. $(2r - 1)(2r - 1)$

44.

47. $(y - 4t)(y - 4t)$

50.

53. $(3t - 2)(3t + 2)(9t^2 + 4)$

56.

59. $5rt(rt + 5)(rt - 5)$

62.

65. $8(2yr + 1)(2yr + 1)$

68.

71. $t^3(8t - 1)(8t - 1)$

74.

77. $5(r - 2)(r + 2)(r^2 + 4)$

80.

83. $y(0.5 + y)(0.5 - y)$ 15. $(t + 12)(t - 12)$

18.

21. $(6 + y)(6 - y)$

24.

27. $(11x^2 + 12)(11x^2 - 12)$

30.

33. $(x^7 + 10y^6)(x^7 - 10y^6)$

36.

39. $(10y + 1)(10y + 1)$

42.

45. $(x + 6r)(x + 6r)$

48.

51. $(6t - 5r)(6t - 5r)$

54.

57. $6y(y + 1)(y - 1)$

60.

63. $3(3x + 1)(3x + 1)$

66.

69. $t^5(5t + 1)(5t + 1)$

72.

75. $3y^4(2y - 1)(2y - 1)$

78.

81. $6x(x^2 + 4)$

84.

Challenge85. $-111(-111)$ **10.6 Factoring Strategies****10.6.3 Exercises****Factoring**15. $6(x + 1)$

16.

17. $9(4y^2 + 3)$

18.

19. $3r(2 + 4r + 5r^2)$

20.

21. $6x^3y^8(9x^2 - x + 7)$

22.

23. $(x + 8)(y + 2)$

24.

25. $(y + 1)(y - 4)$

26.

- | | |
|----------------------------------|-----|
| 27. $(2ry - 3)(ry + 3)$ | 28. |
| 29. $(4r + 1)(r - 2)$ | 30. |
| 31. $(4t - 5)(3t - 2)$ | 32. |
| 33. $(3x - 4y)(x - 3y)$ | 34. |
| 35. $(4y + 9r)(2y + r)$ | 36. |
| 37. $4(3r + 1)(r - 1)$ | 38. |
| 39. $5t^7(2t + 3)(t + 1)$ | 40. |
| 41. $2(3x + 7y)(x + y)$ | 42. |
| 43. $(y + 8)(y + 1)$ | 44. |
| 45. $(r + 8x)(r + 2x)$ | 46. |
| 47. $(r - 6y)(r - 4y)$ | 48. |
| 49. $2(t + 5)(t - 1)$ | 50. |
| 51. $7x^7(x - 1)(x - 3)$ | 52. |
| 53. $2y(x - 7)(x - 2)$ | 54. |
| 55. $x^2(y + 7z)(y - z)$ | 56. |
| 57. $(t + 12)(t - 12)$ | 58. |
| 59. $(3 + x)(3 - x)$ | 60. |
| 61. $(y^6 + 7)(y^6 - 7)$ | 62. |
| 63. $(3y - 2)(3y + 2)(9y^2 + 4)$ | 64. |
| 65. prime | 66. |
| 67. $(t + 6)(t + 6)$ | 68. |
| 69. $(x - 9)(x - 9)$ | 70. |
| 71. $(y + 9x)(y + 9x)$ | 72. |
| 73. $2(7ry + 1)(7ry + 1)$ | 74. |
| 75. $2t^6(7t + 1)(7t + 1)$ | 76. |
| 77. $2(x - 3)(x + 3)(x^2 + 9)$ | 78. |

10.7 Solving Quadratic Equations by Factoring

10.7.5 Exercises

Warmup and Review

- | | | |
|-----------------------|----------------------|-----------------------------|
| 1. $10(y - 6)$ | 2. | 3. $(r - 3)(r + 6)$ |
| 4. | 5. $(3t - 1)(t - 1)$ | 6. |
| 7. $6(5x^2 + 2x + 7)$ | 8. | 9. $(3y^2 + 10)(3y^2 - 10)$ |
| 10. | | |

Solve Quadratic Equations by Factoring

- | | | |
|-------------------------|---------------------------|------------------------------------|
| 11. $x = 1$ or $x = -3$ | 12. | 13. $x = -4$ or $x = \frac{5}{16}$ |
| 14. | 15. $x = -10$ or $x = -1$ | 16. |
| 17. $x = 7$ or $x = -4$ | 18. | 19. $x = 7$ or $x = 4$ |
| 20. | 21. $x = -6$ or $x = -10$ | 22. |
| 23. $x = -7$ or $x = 3$ | 24. | 25. $x = 10$ or $x = 5$ |

26.
29. $x = 0$ or $x = 6$
32.
35. $x = 2$
38.
41. $x = -6$ or $x = 6$
44.
47. $x = 1$ or $x = -12$
50.
53. $x = -2$ or $x = 1$
56.
59. $x = -9$ or $x = -8$ or $x = -3$
62.
27. $x = 0$ or $x = 5$
30.
33. $x = 12$
36.
39. $x = -\frac{9}{4}$ or $x = -4$
42.
45. $x = -\frac{11}{9}$ or $x = \frac{11}{9}$
48.
51. $x = 4$ or $x = -1$
54.
57. $x = -\frac{6}{7}$
60.
63. $x = 0$ or $x = 5$ or $x = 3$
28.
31. $x = 0$ or $x = \frac{3}{8}$
34.
37. $x = -\frac{5}{6}$
40.
43. $x = -\frac{12}{5}$ or $x = \frac{12}{5}$
46.
49. $x = \frac{7}{4}$ or $x = -10$
52.
55. $x = 3$
58.
61. $x = -1$ or $x = 1$ or $x = 0$
64.

Quadratic Equation Application Problems

65. $-5, 7$
67. Answer 1. 8 cm
Answer 2. 17 cm
69. Answer 1. 5 in
Answer 2. 7 in
71. 1 ft
66.
68.
70.
72.

Challenge

73. $(x - 4) * (x - -2) * (x - 2/3) = 0$
74.

10.8 Factoring Chapter Review**10.8.8 Exercises****Factoring out the Common Factor**

1. $3r$ or $-(3r)$
4.
7. $10(9x^2 - 4x + 1)$
10.
2.
5. $6x^{12}y^8$ or $-6x^{12}y^8$
8.
11. $(r - 8)(r + 9)$
3. $6t^{10}$ or $-6t^{10}$
6.
9. prime
12.

Factoring by Grouping

13. $(t + 4)(t - 2)$
16.
19. $(7x + 8y)(x + 9y)$
14.
17. $(x - 10)(y + 5)$
20.
15. $(x^2 + 8)(x - 5)$
18.

Factoring Trinomials with Leading Coefficient One

21. $(t + 3)(t + 7)$
24.
22.
25. prime
23. $(x - 6)(x + 5)$
26.

27. $(y - 2)(y - 2)$

30.

33. $(x - 3r)(x + 2r)$

36.

28.

31. $-(t + 8)(t - 3)$

34.

29. $6(r - 3)(r - 1)$

32.

35. $(y - 5x)(y - 3x)$

Factoring Trinomials with a Nontrivial Leading Coefficient

37. $(3r - 1)(r + 8)$

40.

43. $6(3x - 2)(x - 1)$

46.

49. $2(3x + 4y)(x + 2y)$

38.

41. $(2x - 1)(2x - 3)$

44.

47. $3(2rx - 9)(rx + 1)$

50.

39. prime

42.

45. $2y^7(2y - 3)(y - 4)$

48.

Factoring Special Polynomials

51. $(x + 10)(x - 10)$

54.

57. $(10t - 1)(10t - 1)$

60.

63. $4y(y + 5)(y - 5)$

66.

69. prime

52.

55. $(r^7 + 6)(r^7 - 6)$

58.

61. $(2x - 1)(2x + 1)(4x^2 + 1)$

64.

67. $3(4 + t)(4 - t)$

70.

53. $(2y + 3)(2y - 3)$

56.

59. $(7t - 4x)(7t - 4x)$

62.

65. $6rt^2(rt + 5)(rt - 5)$

68.

73. $2r(3 - 4r + 3r^2)$

75. $(2t - y)(2t - 7y)$

77. $(2t + 9r)(2t + 9r)$

79. $(5x + 7t)(3x + t)$

81. $(2y - 3)(2y + 3)(4y^2 + 9)$

74.

76.

78.

80.

82.

Solving Quadratic Equations by Factoring

83. $x = -3$ or $x = 7$

86.

89. $x = 4$

92.

84.

87. $x = 0$ or $x = 8$

90.

85. $x = -9$ or $x = -10$

88.

91. $x = -\frac{11}{4}$ or $x = -4$

93. Answer 1. 5 in

Answer 2. 9 in

94.

35. Answer 1. -12 36.
 Answer 2. -12

Function Formulas and Solving Equations

37. Answer 1. -4 38.
 Answer 2. $-\frac{3}{4}$
 39. Answer 1. $1, -1$ 40.
 Answer 2. no real solutions
 41. $8, -9$ 42.
 43. Answer 1. 9 44.
 Answer 2.
 45. Answer 1. -4 46.
 Answer 2. $r = 1, r = -1$
 47. Answer 1. 18 48.
 Answer 2. $t = 3, t = 6$

Functions and Points on a Graph

49. Answer 1. $(4, 2)$ 50.
 Answer 2. 0
 51. (r, x) 52.
 53. x 54.

Function Graphs

57. Answer 1. 0 58. 59. Answer 1. -3
 Answer 2. 4 Answer 2. 0
 60. 61. Answer 1. 2 62.
 Answer 2. -7
 63. Answer 1. 3 64. 65. Answer 1. 2
 Answer 2. $x = 0, x = (-4)$ Answer 2. $x = 3$
 66. 67. Answer 1. -2 68.
 Answer 2. $x = 0, x = (-4)$

Function Tables

69. Answer 1. 9.3 70.
 Answer 2. 4.5
 71. $-2; -8; -1; -2; 0; 0; 1; -2; 2; -8$ 72.

Translating Between Different Representations of a Function

73. Answer 1. 0 74.
 Answer 2. 1
 Answer 3. 8
 Answer 4. 27
 Answer 5. 64
 Answer 6. $G(x) = x^3$

75. Answer 1. -3 76.
 Answer 2. -1
 Answer 3. 1
 Answer 4. 3
 Answer 5. 5
 Answer 6. $K(x) = 2x - 3$
77. Answer 1. $-\frac{117}{2}$ 78.
 Answer 2. -18
 Answer 3. $-\frac{5}{2}$
 Answer 4. 0
 Answer 5. $\frac{3}{2}$
 Answer 6. 14
 Answer 7. $\frac{99}{2}$
79. Answer 1. $\frac{11}{4}$ 80.
 Answer 2. 2
 Answer 3. $\frac{3}{2}$
 Answer 4. $\frac{8}{7}$
 Answer 5. $\frac{7}{8}$
 Answer 6. $\frac{2}{3}$
 Answer 7. $\frac{1}{2}$

Functions in Context

81. A
 82.
 83. A
 84.
 85. $f(x) = 8760x$
 86.
 87. Answer 1. $M(x) = \frac{x}{5280}$
 Answer 2. 2.46212
 Answer 3. 13000
 88.
 89. $f(t) = 0.11t + 2.65$
 90.
 91. $f(x) = 10x$
 92.
 93. Answer 1. $s(1.5)$
 Answer 2. 224.75 mi
 Answer 3. $v(t) = 59$
 Answer 4. 308 mi
 94.
 96.

97. Answer 1. 2.5

Answer 2. A

Answer 3. 1, 8

Answer 4. B

98.

99. Answer 1. (b, a)

Answer 2. (d, e)

Answer 3. a

Answer 4. $x = d$ Answer 5. $x = h$

11.2 Domain and Range

11.2.5 Exercises

Review and Warmup

1. Answer 1. $\{C \mid C > 2.5\}$

2.

Answer 2. $(2.5, \infty)$ 3. Answer 1. $\{A \mid A \geq 4\}$

4.

Answer 2. $[4, \infty)$ 5. $[-2, -1]$

6.

7. $(-\infty, -2] \cup [2, \infty)$

8.

Domain and Range From a Graph

9. Answer 1. $\{-8, 3, 4\}$

10.

Answer 2. $\{-8, 7\}$ 11. Answer 1. $(-1, 3]$ Answer 2. $(-6, 6]$

12.

13. Answer 1. $(-2, 3)$

14.

Answer 2. $\{-4\}$ 15. Answer 1. $[-3, 4]$

16.

Answer 2. $[-25, 0]$

17. Answer 1.

 $(-\infty, 0) \cup (0, \infty)$

Answer 2.

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

18.

19. Answer 1.

 $(-\infty, 2) \cup (2, \infty)$

20.

Answer 2. $(-\infty, -1)$ 21. Answer 1. $(-\infty, \infty)$

22.

Answer 2. $[-2, \infty)$ 23. Answer 1. $[-3, 3)$ Answer 2. $[-2, 2]$

24.

25. Answer 1. $[-2, 4]$

26.

Answer 2. $[0, 4]$ 27. Answer 1. $(-\infty, \infty)$

28.

Answer 2. $[-1, \infty)$ 29. Answer 1. $[0, \infty)$ Answer 2. $[0, \infty)$

30.

31. Answer 1. $(-\infty, -2]$

32.

Answer 2. $[-3, \infty)$ 33. Answer 1. $[-1, 7]$

34.

Answer 2. $[-1, 2]$ 35. Answer 1. $[1, 4)$ Answer 2. $(-4, -2) \cup [2, 3)$

36.

Domain From a Formula

- | | |
|---|-----|
| 37. $(-\infty, \infty)$ | 38. |
| 39. $(-\infty, \infty)$ | 40. |
| 41. $(-\infty, \infty)$ | 42. |
| 43. $(-\infty, -9) \cup (-9, \infty)$ | 44. |
| 45. $(-\infty, -\frac{3}{2}) \cup (-\frac{3}{2}, \infty)$ | 46. |
| 47. $(-\infty, 5) \cup (5, 6) \cup (6, \infty)$ | 48. |
| 49. $(-\infty, -9) \cup (-9, 0) \cup (0, \infty)$ | 50. |
| 51. $(-\infty, -7) \cup (-7, 7) \cup (7, \infty)$ | 52. |
| 53. $(-\infty, -\frac{7}{4}) \cup (-\frac{7}{4}, \frac{7}{4}) \cup (\frac{7}{4}, \infty)$ | 54. |
| 55. $(-\infty, \infty)$ | 56. |
| 57. $(10, \infty)$ | 58. |
| 59. $(-\infty, 6]$ | 60. |
| 61. $[\frac{-9}{13}, \infty)$ | 62. |
| 63. $(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$ | 64. |
| 65. $(-\infty, -14) \cup (-14, 7) \cup (7, \infty)$ | 66. |
| 67. $[-2, 8) \cup (8, \infty)$ | 68. |

Domain and Range Using Context

69. **Answer 1.** $[0, 26]$ or $[0, \infty)$
Answer 2. $[0, 7800]$
- 70.
71. **Answer 1.** $[0, 250]$
Answer 2. $[0, 10]$
- 72.
73. **Answer 1.** $[14, 51]$
Answer 2. $[270, 1750]$
- 74.
75. **Answer 1.** $[0, 190]$
Answer 2. $[4, 156]$
- 76.
77. **Answer 1.** $[0, 24]$
Answer 2. $[0, 2304]$
- 78.
79. **Answer 1.** $[0, 25.6]$ or $[0, \infty)$
Answer 2. $[0, 1002]$
- 80.
81. **Answer 1.** $[0, 230]$
Answer 2. $[0, 26450]$

82.

83.

- (a) the set of all possible student identification numbers at that particular school
 (b) the set of all first names of students who attend that school

84.

11.3 Using Technology to Explore Functions

11.3.5 Exercises

Using Technology to Create a Table of Function Values

1. $-2; -37; -1; -14; 0; 3; 1; 14; 2; 19; 3; 18; 4; 11$ 2.
 3. 4.
 $-2; -67.8; -1; 12.8; 0; 93; 1; 172.8; 2; 252.2; 3; 331.2; 4; 409.8$
 5. 6.
 $-2; -94; -1; -35; 0; -18; 1; -1; 2; 58; 3; 201; 4; 470$

Determining Appropriate Windows

7. $[-0.05, 0.81]; [-300, 4600]$ 8.
 9. $[-0.15, 0.01]; [-6419, -6402]$ 10.
 11. $[-40, 38]; [-0.63, 0.04]$ 12.

Finding Points of Intersection

13. two times 14.
 15. one time 16.
 17. two times 18.
 19. two times 20.

Using Technology to Find Key Features of a Graph

21. Answer 1. $(-0.873, 0), (6.873, 0), (0, 2.4)$ 22.
 Answer 2. $(3, 6)$
 Answer 3. $(-\infty, \infty)$
 Answer 4. $(-\infty, 6]$
 23. Answer 1. $(0, 4)$ 24.
 Answer 2. $(-0.002, 3.992)$
 Answer 3. $(-\infty, \infty)$
 Answer 4. $[3.992, \infty)$
 25. Answer 1. $(0.0035, 0), (0, 1.1025)$ 26.
 Answer 2. $(0.0035, 0)$
 Answer 3. $(-\infty, \infty)$
 Answer 4. $[0, \infty)$

Solving Equations and Inequalities Graphically Using Technology

27. **Answer 1.** $(-10, 50), (15, 25)$ **28.**
Answer 2. $\{-10, 15\}$
Answer 3. $(-\infty, -10) \cup (15, \infty)$
Answer 4. $[-10, 15]$
29. **Answer 1.** $(-2, 5), (0.75, 5)$ **30.**
Answer 2. $\{-2, 0.75\}$
Answer 3. $(-2, 0.75)$
Answer 4. $(-\infty, -2] \cup [0.75, \infty)$
31. **Answer 1.** $(-6, 10), (-0.5, 21)$ **32.**
Answer 2. $\{-6, -0.5\}$
Answer 3. $(-6, -0.5)$
Answer 4. $(-\infty, -6] \cup [-0.5, \infty)$
33. $\{-3.25, 2\}$ **34.**
35. $\{-10, 20\}$ **36.**
37. $\{-1.5, 0, 1.5\}$ **38.**
39. $\{-23.162, -16.838\}$ **40.**
41. no real solutions **42.**
43. $(-\infty, -2) \cup (-0.5, \infty)$ **44.**
45. $[0, 1.1]$ **46.**
47. $(-6.372, -0.628)$ **48.**
49. $(-\infty, 0.090098] \cup [1.1099, \infty)$ or $(-\infty, 0.09] \cup$ **50.**
 $[1.1099, \infty)$
51. $(-\infty, \infty)$ **52.**

11.4 Simplifying Expressions with Function Notation

11.4.4 Exercises

Review and Warmup

- | | | |
|-----------------------|--------------------|---------------|
| 1. $5n + 25$ | 2. | 3. $-4x + 24$ |
| 4. | 5. $2y^2 + 4y + 2$ | 6. |
| 7. $16y^2 + 72y + 81$ | 8. | |

Simplifying Function Expressions

- | | |
|-------------------------------------|-----|
| 9. $-3r - 14$ | 10. |
| 11. $5 - t$ | 12. |
| 13. $-4.4x - 11.6$ | 14. |
| 15. $\frac{7}{9}y + \frac{-47}{36}$ | 16. |
| 17. $-6r + 7$ | 18. |
| 19. $1.1t + 13$ | 20. |
| 21. $-392x^2 + 35x + 7$ | 22. |
| 23. $y^2 + y + 4$ | 24. |
| 25. $35y^2 + 20y + 35$ | 26. |
| 27. $-2.4r^2 + 27r + 52$ | 28. |
| 29. $5t^2 + 3t + 9$ | 30. |

31. $\sqrt{-7x - 60}$ 32.
 33. $\sqrt{2 + 6x} + 3$ 34.
 35. $7x + 42 + \sqrt{-5x - 28}$ 36.
 37. $\frac{7}{t+5}$ 38.
 39. $-\frac{5x}{3x^2+2}$ 40.
41. Answer 1. $-4x - 3$ 42.
 Answer 2. $-4x - 28$
 Answer 3. $-20x - 40$
 Answer 4. $-20x - 8$
43. Answer 1. $3x^2 + 4x - 2$ 44.
 Answer 2. $3x^2 - 8x + 4$
 Answer 3. $-6x^2 - 8x$
 Answer 4. $12x^2 - 8x$

Applications

45. $\pi(18t - 0.3t^2)^2 \text{ ft}^2$
 46.
 47. $20480 - \frac{81920}{t+4}$

11.5 Technical Definition of a Function

11.5.4 Exercises

Determining If Sets of Ordered Pairs Are Functions

1. Answer 1. describes
 Answer 2. $\{-10, 2\}$
 Answer 3. $\{0, 10\}$
 Answer 4. describes
 Answer 5. $\{-9, -6, -4\}$
 Answer 6. $\{2, 3, 6\}$
 Answer 7. does not describe
 Answer 8. $\{3, 10\}$
 Answer 9. $\{0, 4, 9\}$
 Answer 10. does not describe
 Answer 11. $\{-10, -8, 3, 8\}$
 Answer 12. $\{3, 6, 7, 10\}$
- 2.
3. Answer 1. does not describe
 Answer 2. $\{-7, -6, -1, 8\}$
 Answer 3. $\{2, 5, 6, 9\}$

4.

Domain and Range5. Answer 1. $\{(1, 3), (3, 1), (6, 4)\}$ Answer 2. $\{1, 3, 6\}$ Answer 3. $\{1, 3, 4\}$

6.

Determining If Graphs Are Functions

7. Answer 1. does not

Answer 2. does not

8.

9. Answer 1. does not

Answer 2. does

10.

Determining If Tables Are Functions11. Answer 1. yes 12.

Answer 2.

None, the table represents a function.

13. Answer 1. no 14.

Answer 2. -3

11.6 Functions Chapter Review

11.6.6 Exercises

Function Basics

1. C

2.

3. Answer 1. -9 4.

Answer 2. undefined

5. Answer 1. 0 6.

Answer 2. -2

7. Answer 1. 7.3 8.

Answer 2. 6.2

9. -2; -16; -1; -4; 0; 0; 1; -4; 2; -16 10.

11. Answer 1. 9

Answer 2. A

Answer 3. 1, 9

Answer 4. A

12.

Domain and Range

13. Answer 1.

$(-\infty, 1) \cup (1, \infty)$

Answer 2. $(-\infty, 1) \cup (1, \infty)$ **16.**

19. $[-8, 5) \cup (5, \infty)$

21. Answer 1. $[0, 32]$ **Answer 2.** $[0, 4096]$ **22.****Using Technology to Explore Functions****23.** $-2; -47; -1; -19; 0; 1; 1; 13; 2; 17; 3; 13; 4; 1$ **24.****25.** $[-10, 10]; [-10000, 10000]$ **26.****27.** one time **28.****29. Answer 1.** $(0, 4)$ **30.****Answer 2.** $(-0.002, 3.992)$ **Answer 3.** $(-\infty, \infty)$ **Answer 4.** $[3.992, \infty)$ **31. Answer 1.** $(-2, 5), (0.75, 5)$ **32.****Answer 2.** $\{-2, 0.75\}$ **Answer 3.** $(-2, 0.75)$ **Answer 4.** $(-\infty, -2] \cup [0.75, \infty)$ **33.** no real solutions **34.****35.** $(-\infty, \infty)$ **36.****Simplifying Expressions with Function Notation****37. Answer 1.** $-3x^2 + 3x - 3$ **38.****Answer 2.** $-3x^2 + 21x - 36$ **Answer 3.** $9x^2 - 9x$ **Answer 4.** $-27x^2 - 9x$ **39.** $-5.1r + 9$ **40.****Technical Definition of a Function****41. Answer 1.** does not describe**Answer 2.** $\{-6, -5, -3, 1\}$ **Answer 3.** $\{0, 3, 7, 9\}$ **42.****43. Answer 1.** $\{(-2, 1), (0, 5), (1, 2)\}$ **Answer 2.** $\{-2, 0, 1\}$ **Answer 3.** $\{1, 2, 5\}$ **44.****45. Answer 1.** does not**Answer 2.** does**14.****17. Answer 1.** $(-\infty, \infty)$ **Answer 2.** $[0, \infty)$ **15. Answer 1.** $[-4, 6]$ **Answer 2.** $[-3, 2]$ **18.****20.**

46.

49. Answer 1. yes

Answer 2.

None, the table represents a function.

51. Answer 1. no

Answer 2. -3

50.

52.

12 Rational Functions and Equations

12.1 Introduction to Rational Functions

12.1.3 Exercises

Rational Functions in Context

1. Answer 1. 330

Answer 2. 247

Answer 3. 28

Answer 4. 240

2.

3. Answer 1. 2

Answer 2. 45

4.

Domain

7. $(-\infty, -4) \cup (-4, \infty)$

10.

13. $(-\infty, -7) \cup (-7, 7) \cup (7, \infty)$

16.

19. $(-\infty, 6) \cup (6, \infty)$

21. $(-\infty, 0) \cup (0, \infty)$

24.

27. Answer 1.

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

Answer 2. $(-\infty, -1)$

8.

11. $(-\infty, -7) \cup (-7, 0) \cup (0, \infty)$

14.

17. $(-\infty, \infty)$

20.

22.

25. Answer 1.

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

Answer 2.

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

28.

9. $(-\infty, -6) \cup (-6, 2) \cup (2, \infty)$

12.

15. $(-\infty, 0) \cup (0, \infty)$

18.

23. $(-\infty, -3) \cup (-3, 5) \cup (5, \infty)$

26.

Graphing Technology

29. 189

30.

31. 200

32.

63. $\frac{1}{t-7}, t \neq -1$ 64.
 65. $\frac{x-9}{x+2}, x \neq -9$ and $x \neq 0$ 66.
 67. $\frac{y+2}{3y-1}, y \neq -2$ and $y \neq 0$ 68.
 69. $\frac{r}{r-4}, r \neq -0.333333$ and $r \neq 0$ 70.

Multiplying and Dividing Rational Expressions with One Variable

73. **Answer 1.** $-\frac{x^7}{x+4}, (-\infty, \infty)$ 74.
Answer 2. $-\frac{x}{x+4}, x \neq 0$
 75. $5(y-2), y \neq -1$ and $y \neq -4$ 76.
 77. $\frac{r^2}{(r+3)(r-2)}, r \neq 3$ and $r \neq 9$ 78.
 79. $-\frac{3(r+4)}{5r(r+1)}, r \neq 1$ and $r \neq -4$ 80.
 81. $-\frac{t-1}{5(6t+5)}, t \neq 0.833333$ and $t \neq 2.5$ and $t \neq 0$ 82.
 83. $\frac{1}{3x(x-6)}, (-\infty, \infty)$ 84.
 85. $4y^4, y \neq 0$ 86.
 87. $\frac{1}{2}, r \neq -(-3)$ 88.
 89. $-\frac{1}{t-3}, t \neq 1.2$ and $t \neq -1.2$ 90.
 91. $x^3(x-5), x \neq 0$ and $x \neq -6$ and $x \neq 5$ 92.
 93. $\frac{5a+1}{a+1}, a \neq 0$ 94.
 95. $\frac{u+6}{5(u-6)}, u \neq 0$ and $u \neq -6$ 96.
 97. $\frac{x(x-2)}{(x-3)(x-4)}, x \neq -3$ and $x \neq -4$ and $x \neq 2$ 98.

Multiplying and Dividing Rational Expressions with More Than One Variable

99. $\frac{4(t+x)}{2t+x}$ 100.
 101. $\frac{3x^3}{2y}$ 102.
 103. $2(y+4t)$ 104.
 105. $2x^5$ 106.
 107. $\frac{t-2y}{t^2}$ 108.
 109. $\frac{1}{x(x-6r)}$ 110.
 111. $y^4(yx-1)$ 112.
 113. $\frac{6t(y-10t)}{y}$ 114.
 115. $\frac{4q}{5}$ 116.
 117. $\frac{3n^3}{5}$ 118.

Challenge

119. $\frac{1}{x+35}$

12.3 Addition and Subtraction of Rational Expressions

12.3.5 Exercises

Review and Warmup

- | | | | |
|-------------------|------------------|--------------------|----|
| 1. $\frac{9}{4}$ | 2. | 3. $\frac{26}{15}$ | 4. |
| 5. $\frac{5}{9}$ | 6. | 7. $\frac{7}{27}$ | 8. |
| 9. $(x+2)(x-2)$ | 10. | 11. $(y+4)(y+10)$ | |
| 12. | 13. $(r-8)(r-9)$ | 14. | |
| 15. $3(t-5)(t-1)$ | 16. | | |

Addition and Subtraction of Rational Expressions with One Variable

- | | |
|---|-----|
| 17. $4, x \neq -4$ | 18. |
| 19. $3, y \neq -6$ | 20. |
| 21. $-\frac{1}{y+1}, y \neq 5$ | 22. |
| 23. $-\frac{1}{r+1}, r \neq 10$ | 24. |
| 25. $\frac{5t}{4}, (-\infty, \infty)$ | 26. |
| 27. $\frac{3x+1}{(x+1)(x-1)}, (-\infty, \infty)$ | 28. |
| 29. $\frac{y+6}{(y-4)(y-2)}, (-\infty, \infty)$ | 30. |
| 31. $\frac{1}{r+2}, r \neq 2$ | 32. |
| 33. $\frac{1}{t+1}, t \neq 1$ | 34. |
| 35. $-\frac{3}{x+4}, x \neq 4$ | 36. |
| 37. $-\frac{3}{y+6}, y \neq 6$ | 38. |
| 39. $\frac{y-4}{y}, y \neq 6$ | 40. |
| 41. $\frac{r+4}{r}, r \neq 8$ | 42. |
| 43. $\frac{4}{t-1}, t \neq -1$ | 44. |
| 45. $-\frac{3x}{x-5}, x \neq 2$ | 46. |
| 47. $-\frac{3y}{y+6}, y \neq -2$ | 48. |
| 49. $-\frac{6}{r+4}, r \neq 0$ | 50. |
| 51. $\frac{-3t+17}{t-5}, (-\infty, \infty)$ | 52. |
| 53. $-\frac{4(3x-20)}{(x+4)(x-4)}, (-\infty, \infty)$ | 54. |

Addition and Subtraction of Rational Expressions with More Than Variable

- | | |
|--|-----|
| 55. $4y + 3x$ | 56. |
| 57. $-\frac{3y}{2x}$ | 58. |
| 59. $\frac{18r^2+20t^3}{15rt^4}, \frac{2(9r^2+10t^3)}{15rt^4}, \text{ or } -\frac{2(-9r^2-10t^3)}{15rt^4}$ | 60. |
| 61. $-\frac{2}{tx+5}$ | 62. |
| 63. $-\frac{6x}{x+2y}$ | 64. |

12.4 Complex Fractions

12.4.3 Exercises

Review and Warmup

1. Answer 1. $\frac{7}{2}$

2.

3. Answer 1. $\frac{16}{9}$

4.

Answer 2. $\frac{yt}{rx}$

Answer 2. $\frac{1}{9}$

5. $-\frac{1}{3}$

6.

7. $\frac{12}{7}$

8.

Simplifying Complex Fractions with One Variable

9. $\frac{9a+7}{a+10}, a \neq 0$

10.

11. $\frac{u+2}{7(u-2)}, u \neq 0$ and $u \neq -2$

12.

13. $\frac{6p+1}{p(p+6)}, (-\infty, \infty)$

14.

15. $\frac{3t(t+5)}{2(-t+5)}, t \neq 0$ and $t \neq -5$

16.

17. $\frac{8(2y-3)}{-y+10}, y \neq 2$

18.

19. $\frac{11c+36}{(3c-13)(c+4)}, c \neq 4$

20.

21. $\frac{10(s+7)}{(8s+55)(s-7)}, s \neq -7$

22.

23. $\frac{(-7q+17)(q-3)}{2(q-2)}, q \neq 1$ and $q \neq 3$

24.

25. $\frac{x^2+4x-25}{-3x-35}, x \neq -5$ and $x \neq 5$

26.

27. $\frac{(c-1)(c+36)}{(c+6)(c-6)}, c \neq -36$

28.

Simplifying Complex Fractions with More Than One Variable

29. $\frac{5t}{6}$

30.

31. $\frac{5q^3}{2}$

32.

33. Answer 1. $\frac{t}{ry}$

34.

Answer 2. $\frac{ty}{r}$

35. $\frac{1}{x(t+5)}$ or $\frac{1}{xt+5x}$

36.

37. $\frac{x+y}{x-6y}$

38.

12.5 Solving Rational Equations

12.5.5 Exercises

Review and Warmup

1. {8}

2.

3. {-8}

4.

5. {0}

6.

7. $x = 11$ or $x = 1$

8.

9. $x = 1$ or $x = -3$

10.

11. $x = -4$ or $x = -11$

12.

Solving Rational Equations

14.

15. {5}

16.

17. {-3}

18.

19. {-2}

20.

21. {-9}

22.

23. {5}

24.

25. $\left\{\frac{-29}{75}\right\}$

26. 27. $\{-4\}$ 28.
 29. $\{-(-9)\}$ 30. 31. no real solutions
 32. 33. no real solutions 34.
 35. $\{-4, -18\}$ 36. 37. $\{-9\}$
 38. 39. $\{8, 1\}$ 40.
 41. $\{6, 13\}$
 42. 43. $\{12\}$
 44. 45. $\{-7\}$
 46. 47. $\{-2\}$
 48. 49. $\{5, -1\}$

Solving Rational Equations for a Specific Variable

50. 51. $m = \frac{b}{q}$ 52.
 53. $C = rB$ 54. 55. $c = \frac{q}{8}$
 56. 57. $a = 8C - 6$

Solving Rational Equations Using Technology

58. 59. $-2.38333, 0.457872$ 60.
 61. $-1.53677, 1.22187$ 62. 63.
 $-0.607409, 0.828675, 3.17873$

Application Problems

64.
 65. 1.5
 66.
 67. Answer 1. 22
 Answer 2. 99
 68.
 69. Answer 1. 6
 Answer 2. 3
 70.
 71. 29.4
 72.
 73. 80
 74.
 75. 23.7396 hr
 76.
 77. $3.68654 \frac{\text{mi}}{\text{hr}}$
 78.
 79. $255.435 \frac{\text{mi}}{\text{hr}}$
 80.

81. Answer 1. 54.2 hr

Answer 2. 67.2 hr

12.6 Rational Functions and Equations Chapter Review

12.6.6 Exercises

Introduction to Rational Functions

1. Answer 1. $(-\infty, -1) \cup (-1, \infty)$ 2.Answer 2. $(-\infty, 1) \cup (1, \infty)$

3. Answer 1. 490 4.

Answer 2. 461

Answer 3. 25

Answer 4. 460

5. Answer 1. 2 6.

Answer 2. 49

7. Answer 1. 2.65 8.

Answer 2. 0.38

Multiplication and Division of Rational Expressions

9. $-\frac{y-t}{y-3t}$ 10.11. $\frac{r+4}{5r-1}$, $r \neq -4$ and $r \neq 0$ 12.13. $\frac{t^2}{(t+4)(t+3)}$, $t \neq 4$ and $t \neq 16$ 14.15. $-\frac{1}{t-2}$, $t \neq 2.33333$ and $t \neq -2.33333$ 16.17. $x^4(xy-3)$ 18.

Addition and Subtraction of Rational Expressions

19. $\frac{1}{y-1}$, $y \neq -1$ 20.21. $\frac{5r}{r+6}$, $r \neq -3$ 22.23. $-\frac{1}{t-4}$, $t \neq 0$ 24.25. $\frac{-20x^2+6y^3}{15xy^4}$, $\frac{2(-10x^2+3y^3)}{15xy^4}$, or $-\frac{2(10x^2-3y^3)}{15xy^4}$ 26.27. $\frac{5y}{y-2r}$ 28.

Complex Fractions

29. Answer 1. $\frac{8}{9}$ 30.Answer 2. $\frac{rx}{ty}$ 31. $\frac{(-3q+5)(q-3)}{2(q-2)}$, $q \neq 1$ and $q \neq 3$ 32.33. $\frac{-5t^2+2t+180}{7t+6}$, $t \neq -6$ and $t \neq 6$ 34.35. $\frac{5y}{6}$ 36.37. $\frac{1}{y(4-x)}$ or $\frac{1}{4y-yx}$ 38.

Solving Rational Equations

39. $\{4\}$ 40.

41. $\{-(-4)\}$ 42.

43. $\{5, -2\}$ 44.

45. $\{-9, 11\}$ 46.

47. $B = 9A - 8$ 48.

51. Answer 1. 22

Answer 2. 99

52.

53. Answer 1. 30

Answer 2. 60

54.

13 Graphs and Equations

13.1 Overview of Graphing

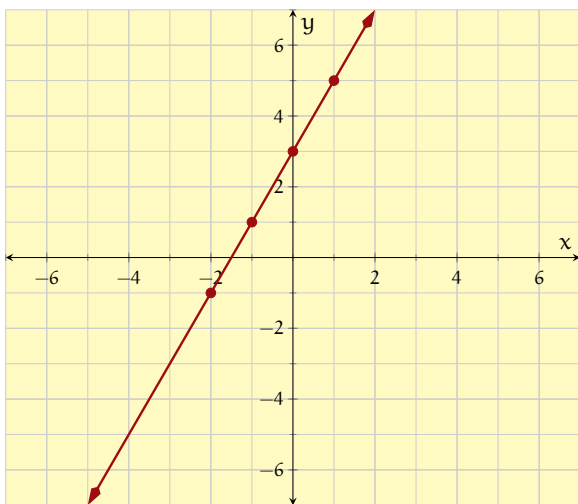
13.1.7 Exercises

Graphing Lines by Plotting Points

1.

x	y = 2x + 3	Point
-2	-1	(-2, -1)
-1	1	(-1, 1)
0	3	(0, 3)
1	5	(1, 5)
2	7	(2, 7)

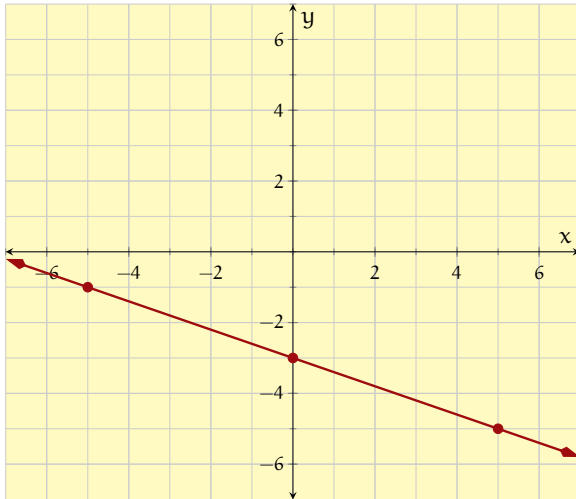
2.



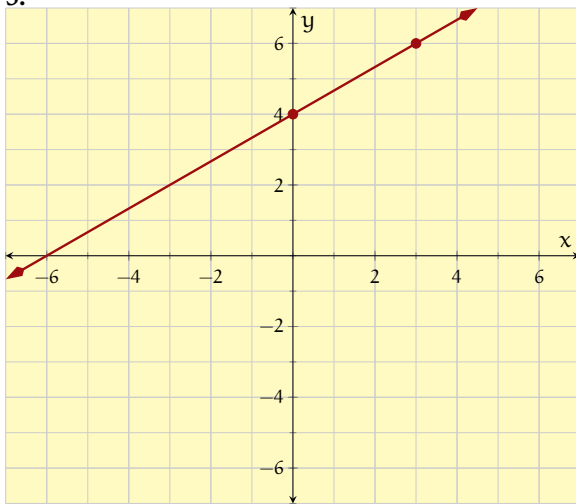
3.

x	$y = -\frac{2}{5}x - 3$	Point
-5	-1	$(-5, -1)$
0	-3	$(0, -3)$
5	-5	$(5, -5)$

4.

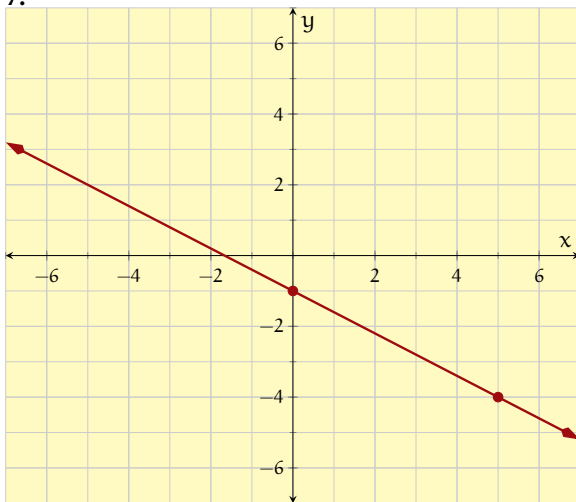
**Graphing Lines in Slope-Intercept Form**

5.



6.

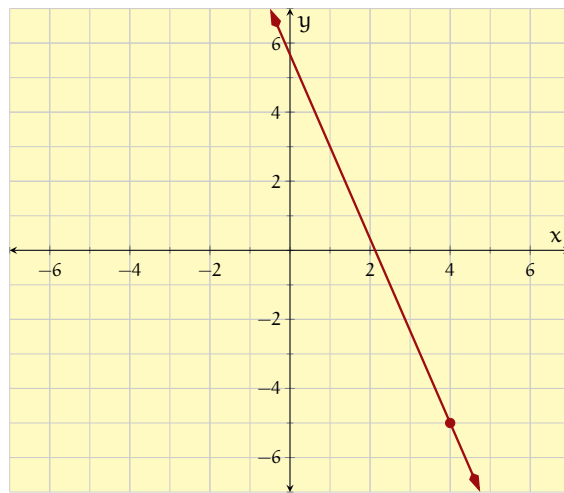
7.



8.

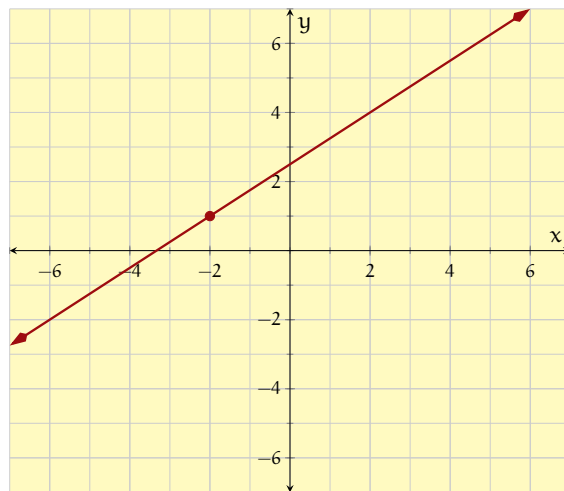
Graphing Lines in Point-Slope Form

9.



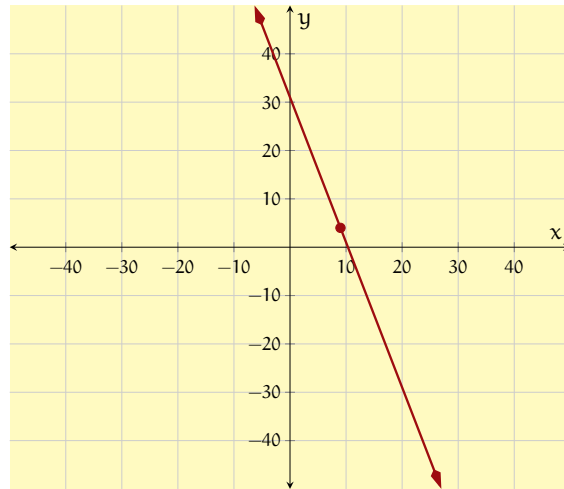
10.

11.



12.

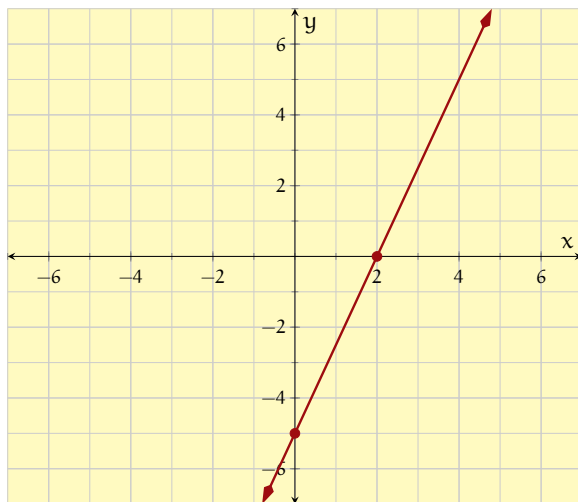
13.



14.

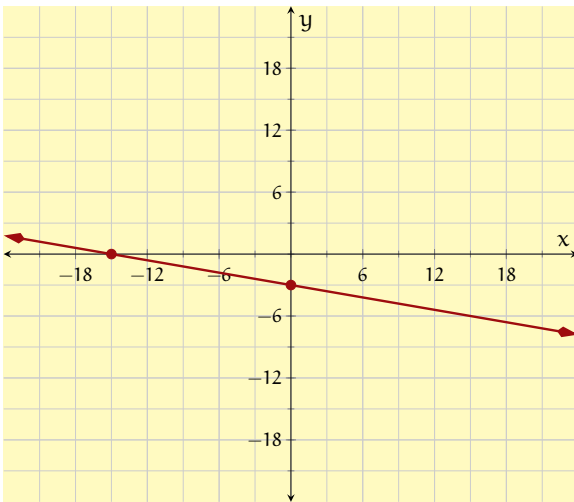
Graphing Lines Using Intercepts

15. x-intercept: $(2, 0)$
y-intercept: $(0, -5)$



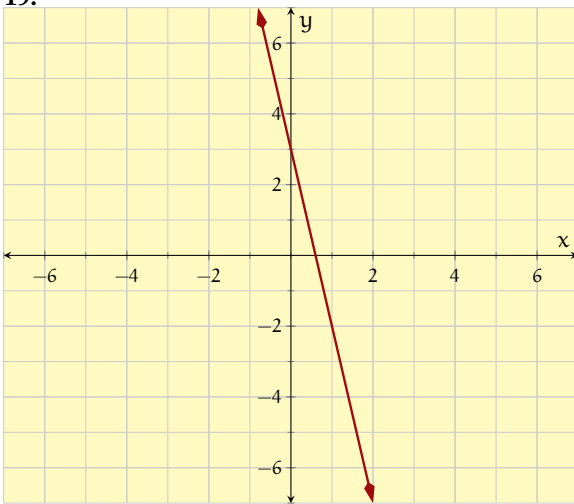
16.

17. x-intercept: $(-15, 0)$
 y-intercept: $(0, -3)$



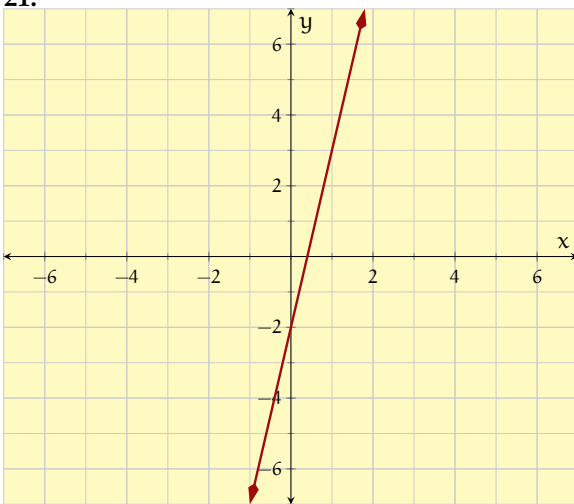
18.

19.



20.

21.

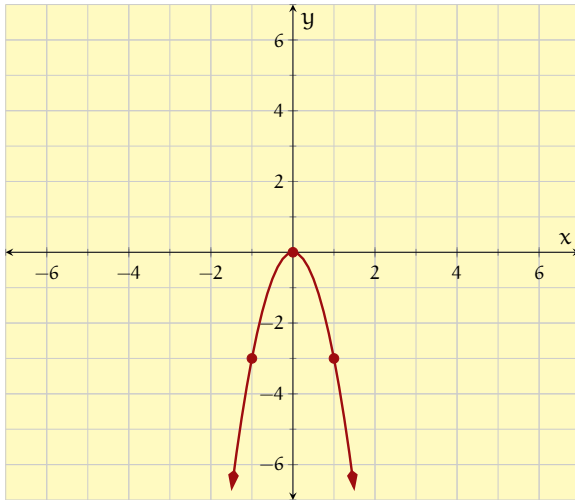


22.

Graphing Functions by Plotting Points

23.

x	$y = -3x^2$	Point
-2	-12	$(-2, -12)$
-1	-3	$(-1, -3)$
0	0	$(0, 0)$
1	-3	$(1, -3)$
2	-12	$(2, -12)$

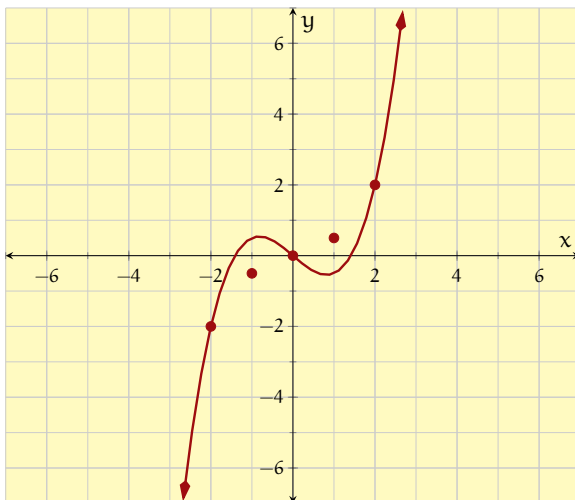


24.

25.

x	$y = \frac{1}{2}x^3 - x$	Point
-2	-2	$(-2, -2)$
-1	$\frac{1}{2}$	$(-1, \frac{1}{2})$
0	0	$(0, 0)$
1	$-\frac{1}{2}$	$(1, -\frac{1}{2})$
2	2	$(2, 2)$

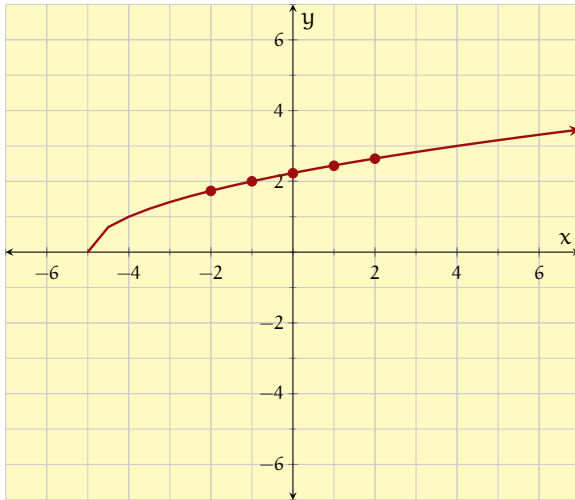
26.



27.

x	$y = \sqrt{x+5}$	Point
-2	1.73...	$(-2, 1.73\dots)$
-1	2	$(-1, 2)$
0	2.23...	$(0, 2.23\dots)$
1	2.44...	$(1, 2.44\dots)$
2	2.64...	$(2, 2.64\dots)$

28.



13.2 Quadratic Graphs and Vertex Form

13.2.6 Exercises

Review and Warmup

1. $t^2 + 3t - 28$

4.

7. $8(y+1)(y+2)$

10.

2.

5. $(x+3)(x+4)$

8.

11. **Answer 1.** $\{r \mid r > 3\}$

Answer 2. $(3, \infty)$

3. $10t^2 + 65t - 35$

6.

9. **Answer 1.** $\{x \mid x \geq 1.5\}$

Answer 2. $[1.5, \infty)$

12.

Technology and Tables

13.

-2; 1; -1; -1; 0; -1; 1; 1; 2; 5; 3; 11; 4; 19

16.

19.

-2; 30; -1; 32; 0; 30; 1; 24; 2; 14; 3; 0; 4; -18

14.

17.

-2; -17; -1; -6; 0; 1; 1; 4; 2; 3; 3; -2; 4; -11

20.

15.

-2; -11; -1; -5; 0; -1; 1; 1; 2; 1; 3; -1; 4; -5

18.

Technology and Features of Quadratic Function Graphs

29. Answer 1. $(2, -2)$ 30.
 Answer 2. $(0, 2)$
 Answer 3. $(0.585786, 0), (3.41421, 0)$
 Answer 4. $(-\infty, \infty)$
 Answer 5. $[-2, \infty)$
 Answer 6. -1
 Answer 7. $\{0, 4\}$
 Answer 8. $(-\infty, 0] \cup [4, \infty)$
31. Answer 1. $(0.954545, 3.19773)$ 32.
 Answer 2. $(0, 4.2)$
 Answer 3. NONE
 Answer 4. $(-\infty, \infty)$
 Answer 5. $[3.19773, \infty)$
 Answer 6. 4.4
 Answer 7. $\{-0.325466, 2.23456\}$
 Answer 8. $(-\infty, -0.325466) \cup (2.23456, \infty)$
33. Answer 1. $(-3.45, -3.0675)$ 34.
 Answer 2. $(0, 0.9)$
 Answer 3. $(-6.48356, 0), (-0.416438, 0)$
 Answer 4. $(-\infty, \infty)$
 Answer 5. $[-3.0675, \infty)$
 Answer 6. -3
 Answer 7. $\{-5.94048, -0.959518\}$
 Answer 8. $(-5.94048, -0.959518)$

Applications

35. 250 ft
 36.
 37. 850
 38.
 39. 5.46535
 40.
 41. 5
 42.
 43. 130, 130
 44.

Quadratic Functions in Vertex Form

45. $(-7, 4)$ 46. 47. $(-1, 4)$
 48. 49. $(5.4, -2.9)$ 50.
 51. $-2(x+1)^2 + 5$ 52. 53. $(x-4)^2 - 2$
 54. 55. $2(x-3)^2 - 4$ 56.

57. $f(x) = -8(x - 9)^2 + 4$ 58.

59. $f(x) = -4(x - 4)^2 + -2$ 60.

61. Answer 1. $(-\infty, \infty)$ 62.

Answer 2. $[-3, \infty)$

63. Answer 1. $(-\infty, \infty)$ 64.

Answer 2. $[-4, \infty)$

65. Answer 1. $(-\infty, \infty)$ 66.

Answer 2. $(-\infty, 4]$

67. Answer 1. $(-\infty, \infty)$ 68.

Answer 2. $[1, \infty)$

69. Answer 1. $(-\infty, \infty)$ 70.

Answer 2. $[2, \infty)$

71. Answer 1. 3; right

Answer 2. 7; down

72.

73. Answer 1. 71.6; right

Answer 2. 14.5; down

74.

75. Answer 1. $\frac{9}{5}$; right

Answer 2. $\frac{3}{2}$; up

76.

Three Forms of Quadratic Functions

77. Answer 1. $x^2 - 4x + 3$ 78.

Answer 2. $(x + (-1))(x - 3)$

79. Answer 1. $x^2 - 8x - 65$ 80.

Answer 2. $(x + 5)(x - 13)$

Factored Form and Intercepts

81. Answer 1. $(0, 15)$ 82.

Answer 2. $(5, 0), (3, 0)$

83. Answer 1. $(0, 81)$ 84.

Answer 2. $(9, 0), (1, 0)$

85. Answer 1. $(0, 0)$ 86.

Answer 2. $(0, 0), (-5, 0)$

87. $(0, -2)$ 88.

89. Answer 1. $(0, -135)$ 90.

Answer 2. $(-\frac{9}{8}, 0), (\frac{5}{2}, 0)$

13.3 Completing the Square

13.3.6 Exercises

Review and Warmup

- | | |
|--|-----|
| 1. $\{-2, -10\}$ | 2. |
| 3. $\{\frac{14}{3}, 0\}$ | 4. |
| 5. $\{1 + \sqrt{19}, 1 - \sqrt{19}\}$ | 6. |
| 7. $\{4, -12\}$ | 8. |
| 9. $\{0, -2\}$ | 10. |
| 11. $\{\frac{1+\sqrt{10}}{4}, \frac{1-\sqrt{10}}{4}\}$ | 12. |

Completing the Square to Solve Equations

- | | | |
|------------------------------------|--|--|
| 13. $\{-2, 8\}$ | 14. | 15. $\{2, 3\}$ |
| 16. | 17. $\{-3 - \sqrt{7}, -3 + \sqrt{7}\}$ | 18. |
| 19. $\{1, 5\}$ | 20. | 21. $\{2, 7\}$ |
| 22. | 23. $\{4 - \sqrt{17}, 4 + \sqrt{17}\}$ | 24. |
| 25. $\{\frac{7}{6}, \frac{5}{2}\}$ | 26. | 27. $\{\frac{-5}{4} - \frac{1}{4}\sqrt{57}, \frac{-5}{4} + \frac{1}{4}\sqrt{57}\}$ |
| 28. | | |

Converting to Vertex Form

- | | |
|--|-----|
| 29. Answer 1. $f(x) = (x + 4)^2 - 17$ | 30. |
| Answer 2. $(-4, -17)$ | |
| 31. Answer 1. $h(y) = (y + \frac{5}{2})^2 - \frac{5}{4}$ | 32. |
| Answer 2. $(\frac{-5}{2}, \frac{-5}{4})$ | |
| 33. Answer 1. $F(r) = 6(r - 1)^2 - 8$ | 34. |
| Answer 2. $(1, -8)$ | |

Domain and Range

- | | |
|-----------------------------------|-----|
| 35. Answer 1. $(-\infty, \infty)$ | 36. |
| Answer 2. $[-10, \infty)$ | |
| 37. Answer 1. $(-\infty, \infty)$ | 38. |
| Answer 2. $(-\infty, -4]$ | |
| 39. Answer 1. $(-\infty, \infty)$ | 40. |
| Answer 2. $[2, \infty)$ | |
| 41. Answer 1. $(-\infty, \infty)$ | 42. |
| Answer 2. $(-\infty, 9]$ | |

Information from Vertex Form

- | | |
|----------------------|-----|
| 63. $\frac{33}{7}$ | 64. |
| 65. $\frac{109}{36}$ | 66. |

67. $(-\infty, \frac{45}{4}]$

69. $[\frac{-28}{3}, \infty)$

71. 114.5 ft

68.

70.

72.

13.4 Absolute Value Equations

13.4.5 Exercises

Review and Warmup

1. $\{80\}$

4.

2.

5. $\{(1/7)\}$

3. $\{-10\}$

6.

Solving Absolute Value Equations Algebraically

7. Answer 1. $7x = 9$

Answer 2. $7x = -9$

Answer 3. $1.28571, -1.28571$

9. Answer 1. $0.2r = -1$

Answer 2. $0.2r = 13$

Answer 3. $-5, 65$

13. $-0.3, -1.5$

15. $-6, 8$

17. $-7, 7$

20.

23. $-2, 5$

26.

29. $3, -1.66667$

32.

35. $-15, 9$

38.

41. NONE

43. 3

45. $\{1, -1\}$

47. -0.5

49. $-0.2, 13$

51. $1.5, 0.125$

8.

10.

14.

16.

18.

21. $-9, 8$

24.

27. -2

30.

33. $3.625, -1.375$

36.

39. NONE

42.

19. $-2, 16$

22.

25. NONE

28.

31. $-24, 16$

34.

37. 3

40.

44.

46.

48.

50.

52.

Challenge

53. $[5, 10]$

13.5 Solving Mixed Equations

13.5.4 Exercises

Solving Mixed Equations

- | | |
|--|-----|
| 1. $\{81\}$ | 2. |
| 3. $\{-3\}$ | 4. |
| 5. $x = -9$ or $x = 3$ | 6. |
| 7. no solution | 8. |
| 9. $\left\{\frac{3}{2} - \frac{1}{2}\sqrt{15}, \frac{3}{2} + \frac{1}{2}\sqrt{15}\right\}$ | 10. |
| 11. $x = -1 - 2\sqrt{2}$ or $x = -1 + 2\sqrt{2}$ | 12. |
| 13. $-2, 5$ | 14. |
| 15. $\{5, 24\}$ | 16. |
| 17. $y = 8$ or $y = 6$ | 18. |
| 19. $\{20\}$ | 20. |
| 21. $\{96\}$ | 22. |
| 23. $x = -9$ or $x = 1$ | 24. |
| 25. $-2.4, -0.444444$ | 26. |
| 27. $x = -4$ or $x = -7$ | 28. |
| 29. $\{-4\}$ | 30. |
| 31. $x = 0$ or $x = -6$ | 32. |
| 33. NONE | 34. |
| 35. no real solutions | 36. |
| 37. $-14, 16$ | 38. |
| 39. $x = -\frac{11}{5}$ or $x = -4$ | 40. |
| 41. $\{9\}$ | 42. |
| 43. $\{4\}$ | 44. |
| 45. $\{-3, 9\}$ | 46. |

13.6 Compound Inequalities

13.6.7 Exercises

Review and Warmup

- | | |
|---|----|
| 1. Answer 1. $\{C \mid C > 0.5\}$ | 2. |
| Answer 2. $(0.5, \infty)$ | |
| 3. Answer 1. $\{C \mid C \geq 2.5\}$ | 4. |
| Answer 2. $[2.5, \infty)$ | |
| 5. Answer 1. $\{x \mid x < -6\}$ or $\{x \mid -6 > x\}$ | 6. |
| Answer 2. $(-\infty, -6)$ | |

7. **Answer 1.** $\{x \mid x \leq -3\}$ or $\{x \mid -3 \geq x\}$ **8.**
Answer 2. $(-\infty, -3]$
9. **Answer 1.** $\{x \mid x \geq 0\}$ or $\{x \mid 0 \leq x\}$ **10.**
Answer 2. $[0, \infty)$
11. **Answer 1.** $\{t \mid t < 10\}$ or $\{t \mid 10 \geq t\}$ **12.**
Answer 2. $(-\infty, 10)$

Check Solutions

13. **Answer 1.** is not **14.**
Answer 2. is
Answer 3. is
Answer 4. is

Compound Inequalities and Interval Notation

15. $(-9, 9]$ **16.**
 17. $(-\infty, -7) \cup [2, \infty)$ **18.**
 19. $(-\infty, 5]$ **20.**
 21. $[8, \infty)$ **22.**
 23. $[-10, 1)$ **24.**

Solving a Compound Inequality Algebraically

25. $[7, 12)$ **26.**
 27. $[-3, 2)$ **28.**
 29. $[69.8, 120.2]$ **30.**
 31. $(-\infty, 0] \cup [0.625, \infty)$ **32.**
 33. $[-1.0625, 13.5]$ **34.**
 35. $[-1.78947, 1.5]$ **36.**
 37. $(-\infty, -2.9] \cup [1.81818, \infty)$ **38.**
 39. **Answer 1.** $\{x \mid 6 < x < 27\}$ **40.**
Answer 2. $(6, 27)$
 41. **Answer 1.** $\{x \mid -35 < x \leq 14\}$ **42.**
Answer 2. $(-35, 14]$

Applications

43. **Answer 1.** $17 - 10x$
Answer 2. $[-33, 17]$

Challenge

- 44.

13.7 Solving Inequalities Graphically**13.7.5 Exercises****Review and Warmup**

1. Answer 1. $\{b \mid b > -0.5\}$ 2.
 Answer 2. $(-0.5, \infty)$
3. Answer 1. $\{C \mid C \geq 1.5\}$ 4.
 Answer 2. $[1.5, \infty)$
5. Answer 1. $(0, 4)$ 6.
 Answer 2. $(-0.002, 3.992)$
 Answer 3. $(-\infty, \infty)$
 Answer 4. $[3.992, \infty)$
7. Answer 1. $(0.0035, 0), (0, 1.1025)$ 8.
 Answer 2. $(0.0035, 0)$
 Answer 3. $(-\infty, \infty)$
 Answer 4. $[0, \infty)$
13. Answer 1. $(-6, 5), (2, 5)$ 14.
 Answer 2. $\{-6, 2\}$
 Answer 3. $(-\infty, -6) \cup (2, \infty)$
15. Answer 1. $(-2.5, -5), (4, -5)$ 16.
 Answer 2. $\{-2.5, 4\}$
 Answer 3. $(-2.5, 4)$
17. Answer 1. $(-2, 3), (2, -1)$ 18.
 Answer 2. $\{-2, 2\}$
 Answer 3. $(-\infty, -2) \cup (2, \infty)$
19. Answer 1. $(-2, -2), (0, 0), (2, 2)$ 20.
 Answer 2. $\{-2, 0, 2\}$
 Answer 3. $(-2, 0) \cup (2, \infty)$
21. Answer 1. $(-3, 1), (5, 3)$ 22.
 Answer 2. $\{-3, 5\}$
 Answer 3. $(-3, 5)$
23. Answer 1. $(-2, -2), (0, 0)$ 24.
 Answer 2. $\{-2, 0\}$
 Answer 3. $(-\infty, -2) \cup (0, \infty)$

Solving Equations and Inequalities Graphically Using Technology

25. Answer 1. $(-10, 50), (15, 25)$ 26.
 Answer 2. $\{-10, 15\}$
 Answer 3. $(-\infty, -10) \cup (15, \infty)$
 Answer 4. $[-10, 15]$
27. Answer 1. $(-2, 5), (0.75, 5)$ 28.
 Answer 2. $\{-2, 0.75\}$
 Answer 3. $(-2, 0.75)$
 Answer 4. $(-\infty, -2] \cup [0.75, \infty)$

29. Answer 1. $(-6, 10), (-0.5, 21)$ 30.
 Answer 2. $\{-6, -0.5\}$
 Answer 3. $(-6, -0.5)$
 Answer 4. $(-\infty, -6] \cup [-0.5, \infty)$
 31. $\{-10, 20\}$ 32.
 33. $(-1, 5)$ 34.
 35. $(-\infty, -1] \cup [-0.5, \infty)$ 36.
 37. $(-\infty, -2.907) \cup (0.573, \infty)$ 38.
 39. $(-\infty, \infty)$ 40.
 41. $[0, 15]$

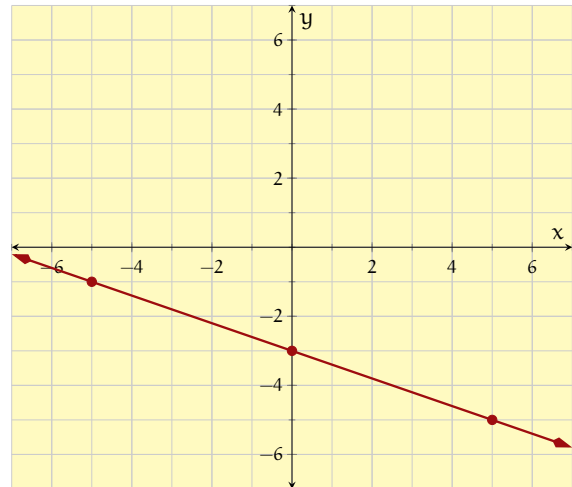
13.8 Graphs and Equations Chapter Review

13.8.8 Exercises

Overview of Graphing

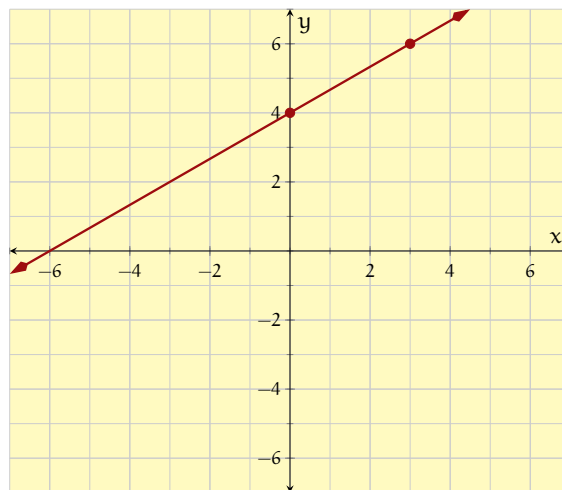
1.

x	$y = -\frac{2}{5}x - 3$	Point
-5	-1	$(-5, -1)$
0	-3	$(0, -3)$
5	-5	$(5, -5)$



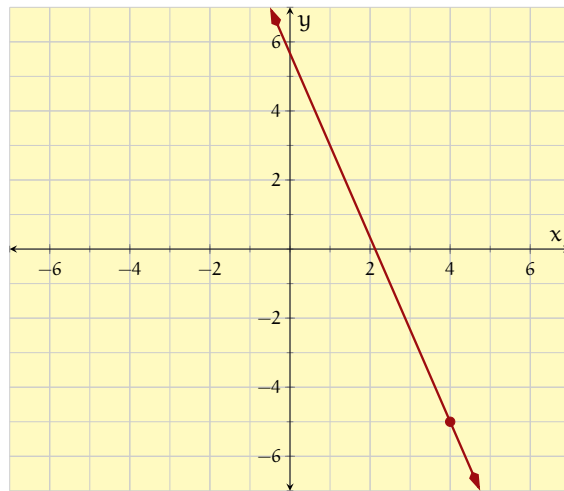
2.

3.



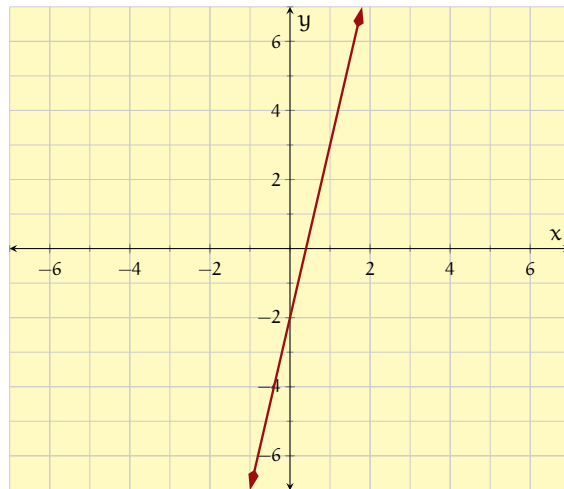
4.

5.



6.

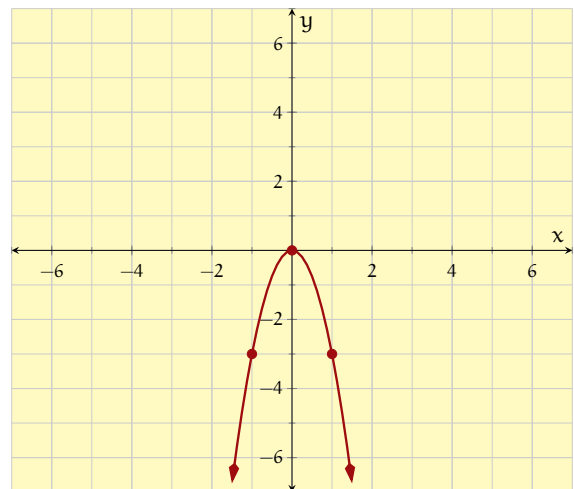
7.



8.

9.

x	$y = -3x^2$	Point
-2	-12	$(-2, -12)$
-1	-3	$(-1, 3)$
0	0	$(0, 0)$
1	-3	$(1, -3)$
2	-12	$(2, -12)$



10.

Quadratic Graphs and Vertex Form

11. Answer 1. (0.5, 2.5) 12.

Answer 2. (0, 3)

Answer 3. NONE

Answer 4. $(-\infty, \infty)$ Answer 5. $[2.5, \infty)$

Answer 6. 3

Answer 7. $\{-0.822876, 1.82288\}$ Answer 8. $(-\infty, -0.822876] \cup [1.82288, \infty)$

13. Answer 1. 5.3125 14.

Answer 2. 751.562

15. Answer 1. 9; right 16.

Answer 2. 7; down

17. Answer 1. $x^2 - 2x + 1$ 18.Answer 2. $(x + (-1))(x - 1)$

19. Answer 1. (0, -4) 20.

Answer 2. $(-1, 0), (4, 0)$ **Completing the Square**21. $\{-1, 2\}$ 22.23. $\{\frac{5}{3}, 3\}$ 24.25. Answer 1. $(-\infty, \infty)$ 26.Answer 2. $(-\infty, 3]$ **Absolute Value Equations**

31. -1.5, -3 32.

33. 0, 3 34.

35. -48, -8 36.

37. 4 38.

39. -1.8, -0.333333 40.

41. 1.8, 1 42.

Solving Mixed Equations

43. no real solutions 44.

45. -8, 10 46.

47. $x = -\frac{5}{2}$ or $x = -10$ 48.49. $\{6\}$ 50.51. $\{60\}$ 52.53. $\{-4, -2\}$ 54.**Compound Inequalities**55. $(-\infty, -3.5) \cup (-0.75, \infty)$ 56.57. $(-1.83333, 1.23529)$ 58.

