pg 7-9 #7-15, 21-27, 34, 38

7. $x = -5$

8. $g = 24$

9. $p = 21$

10. $y = -2.04$

11. $x = 9\pi$

12. $w = 10\pi$

13. $d = \frac{1}{2}$

14. $r = -\frac{7}{24}$

15. $n = -4.9$

21. $m = 7.3\pi$

22. $g = -6$

23. $k = 1\frac{2}{3}$

24. $x = 0.2$

25. $p = -2\frac{1}{3}$

26. $d = 4$

27. They should have added 1.5 to each side.

$$-1.5 + k = 8.2$$
$$k = 8.2 + 1.5$$
$$k = 9.7$$

34. $w = 19$

38. $p = -\frac{1}{12}$

pg 14-15 #6-12, 19-22

6. $x = 3$

7. $c = 0.5$

8. $x = -2$

9. $h = -9$

10. $v = 2$

11. $x = -\frac{2}{9}$

12. They did not distribute the -2 properly.

$$\begin{aligned} -2(7 - y) + 4 &= -4 \\ -14 + 2y + 4 &= -4 \\ 2y - 10 &= -4 \\ 2y &= 6 \\ y &= 3 \end{aligned}$$

19. $<$

20. $=$

21. $>$

22. D

pg 23-25 #8-12, 15, 21-26, 30

8. $x = 8.2$

9. $p = -48$

10. $w = 2$

11. $n = -3.5$

12. $z = 1.6$

15. The 4 should have been added to the right side.

$$\begin{aligned} 3x - 4 &= 2x + 1 \\ 3x - 2x - 4 &= 2x + 1 - 2x \\ x - 4 &= 1 \\ x - 4 + 4 &= 1 + 4 \\ x &= 5 \end{aligned}$$

21. no solution

22. infinitely many solutions

23. infinitely many solutions

24. $x = 6$

25. $x = 2$

26. no solution

30. When the equation is $0 = 0$, it means it is true for all values of n, not just 0; The equation has infinitely many solutions.

pg 30-31 #5-12, 20, 21

5. $y = 4 - \frac{1}{3}x$

6. $y = 35 - 15x$

7. $y = \frac{2}{3} - \frac{4}{9}x$

8. $y = \frac{7}{2}x - \frac{\pi}{2}$

9. $y = 3x - 1.5$

10. $y = \frac{4}{3} + \frac{1}{4}x$

11. The y should have a negative sign in front of it.

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

12. **a.** $C = K - 273.15$

b. 26.85°C

20. The rewritten formula is a general solution that can be reused.

21. **a.** $F = 32 + \frac{9}{5}(K - 273.15)$

b. 32°F

c. liquid nitrogen

pg 33-35 #1-3, 7-16

1. $y = -19$
2. $n = -8$
3. $t = 12\pi$
7. $m = 6$
8. $p = 0.4$
9. $n = -19$
10. no solution
11. no solution
12. infinitely many solutions
13. $y = -\frac{1}{6}x + \frac{4}{3}$
14. $y = 2x - 3$
15. $y = -\frac{1}{2}x + 2$
16. **a.** $K = \frac{5}{9}(F - 32) + 273.15$

    b. about 388.71 K

pg 287 #1-9

1. $=$
2. $<$
3. $<$
4. *Sample answer:* $-0.009, -0.001, 0.01$
5. *Sample answer:* $-1.75, -1.74, 1.74$
6. *Sample answer:* $-0.75, 0.74, 0.75$
7. -3
8. 181
9. 99

pg 292-293 #5, 6, 9-11, 14, 15, 18, 19, 21, 22, 25, 26, 31, 34

5. $s = 1.3$ km

6. $r = 8$ in.

9. 2 and -2

10. 12 and -12

11. 25

14. $-\frac{3}{10}$

15. 2.2 and -2.2

18. -1.5

19. The positive and negative square roots should have been given.

$\pm\sqrt{\frac{1}{4}} = \frac{1}{2}$ and $-\frac{1}{2}$

21. -116

22. 7

25. 25

26. -2

31. =

34. yes; *Sample answer:* Consider the perfect squares, a^2 and b^2. Their product can be written as $a^2b^2 = a \cdot a \cdot b \cdot b = (a \cdot b) \cdot (a \cdot b) = (a \cdot b)^2$.

pg 298-299 #4, 5, 7, 10, 11, 13, 15, 17, 18, 20, 24, 27, 28

4. $\frac{1}{3}$ ft

5. 0.4 m

7. -5

10. $-\frac{1}{8}$

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

13. $3\frac{5}{8}$

15. $\frac{7}{12}$

17. 74

18. 55

20. 135

24. >

27. $-1, 0, 1$

28. **a.** not true; *Sample answer:* $\sqrt[3]{-8} = -2$

b. not true; *Sample answer:* 64 has only a positive cube root.

pg 304-305 #3, 5, 7, 8, 9, 11, 16 (draw diagram), 17

3. 29 km

5. 9 in.

7. 24 cm

8. $11\frac{2}{3}$ yd

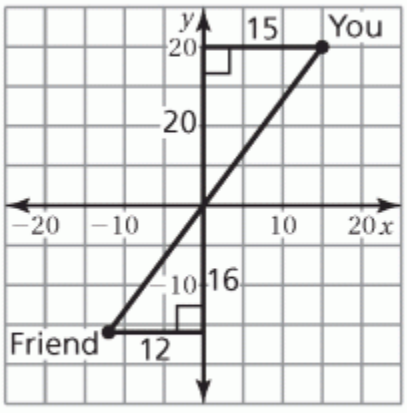
9. The length of the hypotenuse was substituted for the wrong variable.

$a^2 + b^2 = c^2$
$7^2 + b^2 = 25^2$
$49 + b^2 = 625$
$b^2 = 576$
$b = 24$

11. 16 cm

16. 7

17. **a.** *Sample answer:*



b. 45 ft

pg 313-315 #5, 8-11, 15, 19, 20, 23-25, 27, 28, 39, 50

5. yes

8. yes

9. whole, integer, rational

10. natural, whole, integer, rational

11. irrational

15. irrational

19. **a.** If the last digit is 0, it is a whole number. Otherwise, it is a natural number.

b. irrational number

c. irrational number

20. **a.** 7

b. 6.8

23. **a.** -10

b. -10.2

24. **a.** 3

b. 2.6

25. **a.** -13

b. -12.9

27. $\sqrt{15}$; $\sqrt{15}$ is positive and -3.5 is negative.

28. $\sqrt{133}$; $\sqrt{133}$ is to the right of $10\frac{3}{4}$.

39. 20.6 in.

50. Sample answers are given.

a. always; The product of two fractions is a fraction.

$$\frac{2}{3} \cdot \frac{3}{4} = \frac{1}{2}$$

b. sometimes; $\pi \cdot 0 = 0$ is rational, but $2 \cdot \sqrt{3}$ is irrational.

c. sometimes; $\sqrt{2} \cdot \pi$ is irrational, but $\pi \cdot \frac{1}{\pi}$ is rational.

pg 325-327 #3, 5, 6, 7, 9, 11, 13-16, 19, 20, 22, 23

3. 1.3 and -1.3

5. $3\frac{2}{3}$

6. -30

7. 9

9. $-\frac{2}{3}$

11. 17

13. 37 in.

14. 0.4 cm

15. rational

16. irrational

19. **a.** 9

b. 9.5

20. **a.** 13

b. 13.2

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

23. $-1\frac{2}{3}$

pg 414-415 #3-9 odd, 12-14, 16-18, 22-24, 26

3. 3^4

5. $\left(-\frac{1}{2}\right)^3$

7. $\pi^3 x^4$

9. $(6.4)^4 b^3$

12. -1331

13. 1

14. $\frac{1}{64}$

16. $-\frac{1}{729}$

17. The negative sign is not part of the base;
$-6^2 = -(6 \cdot 6) = -36.$

18. $3^3 \cdot 5^2$

22. 65

23. 5

24. 5

26. 2

pg 420-421 #3, 5, 8, 10-12, 14-16, 18, 19, 21, 23, 26

3. 3^4

5. $(-4)^{12}$

8. $\left(\frac{2}{3}\right)^8$

10. $(-2.9)^8$

11. 5^{12}

12. b^{36}

14. $\left(-\frac{3}{4}\right)^{10}$

15. The bases should not be multiplied.

$$5^2 \cdot 5^9 = 5^{2+9}$$
$$= 5^{11}$$

16. The exponents should not be added. Write the expression as repeated multiplication.

$$(r^6)^4 = r^6 \cdot r^6 \cdot r^6 \cdot r^6$$
$$= r^{6+6+6+6}$$
$$= r^{24}$$

18. $-243v^5$

19. $\frac{1}{25}k^2$

21. $r^{12}\,t^{12}$

23. no; $3^2 + 3^3 = 9 + 27 = 36$ and $3^5 = 243$

26. x^4

pg 426-427 #3, 5, 8, 10, 12, 13, 15, 17, 18, 20, 21, 24, 25, 28, 32

3. 6^6

5. $(-3)^3$

8. 64

10. $(-7.9)^6$

12. π^4

13. b^{13}

15. You should subtract the exponents instead of dividing them.

$$\frac{6^{15}}{6^5} = 6^{15-5}$$
$$= 6^{10}$$

17. 2^9

18. $(-8.3)^2$

20. c^5

21. k^{14}

24. $6w$

25. $125a^3b^2$

28. m^9n

32. 10; The difference in the exponents needs to be 9. To find x, solve the equation $3x - (2x + 1) = 9$.

p. 442-443 #c, d, 3

No answers for this section

pg 432-433 #6, 8, 9, 12, 15, 17, 19, 21-27 odd, 29-32

6. 125

8. 1

9. $\frac{1}{36}$

12. $-\frac{1}{3}$

15. $\frac{1}{125}$

17. The negative sign goes with the exponent, not the base.
$(4)^{-3} = \frac{1}{4^3} = \frac{1}{64}$

19. 2^0; 10^0

21. $\frac{a^7}{64}$

23. $5b$

25. 12

27. $\frac{w^6}{9}$

29. 100 mm

30. 10,000 micrometers

31. 1,000,000 nanometers

32. 1,000,000 micrometers

pg 435 #1, 2, 4-10, 12-17

1. $(-5)^4$

2. 7^2m^3

4. 64

5. 1

6. $\frac{1}{125}$

7. 3^9

8. a^{15}

9. $81c^4$

10. $\frac{4}{49}p^2$

12. 6^8

13. π^3

14. t^{10}

15. $\frac{8}{d^6}$

16. $\frac{3}{x^2}$

17. **a** 10^{-3} m

b. 1 millimeter; The length is less than 1 meter and a millimeter is smaller
than a meter.

pg 440 #1-5, Practice 3-5

No answers for this section

pg 440-441 #3-5, 6, 8, 9, 16, 23, 24, 28, 32

3. 5,600,000,000,000

4. 0.00000000021

5. 87,300,000,000,000,000

6. yes; The factor is greater than or equal to 1 and less than 10. The power of 10 has an integer exponent.

8. no; The factor is less than 1.

9. no; The factor is greater than 10.

16. 0.008

23. 9,725,000

24. The negative exponent means the decimal point will move left, not right, when the number is written in standard form. $4.1 \times 10^{-6} = 0.0000041$

28. The value of the number is 10 times greater.

32. See *Taking Math Deeper*.

pg 446-447 #6, 11-13, 16, 19, 24, 25

6. 6.25×10^{-6}

11. 8.4×10^{5}

12. The decimal point moved 5 places to the right, so the exponent should be negative. 3.6×10^{-5}

13. 72.5 is not less than 10.
The decimal point needs to move one more place to the left. 7.25×10^{7}

16. 5.7×10^{10}, 9.66×10^{11}, 5.76×10^{12}

19. 6.88×10^{-23}, 5.78×10^{23}, 5.82×10^{23}

24. 0.02, $\frac{5}{241}$, 2.1×10^{-2}

25. 6.25×10^{-3}, 6.3%, 0.625, $6\frac{1}{4}$

pg 452-453 #5-8, 15, 17-23 odd, 25, 26

5. 4.947×10^{11}

6. 2.79×10^{8}

7. 5.8×10^{5}

8. 1.83×10^{-9}

15. You have to rewrite the numbers so they have the same power of 10 before adding; 3.03×10^{9}

17. 2.9×10^{-3}

19. 1.5×10^{0}

21. 2.88×10^{-7}

23. 1.12×10^{-2}

25. 4.006×10^{9}

26. 2.9×10^{-2}

pg 455-457 #1, 2, 4-7, 9, 11, 12, 14, 17, 19-21, 23, 27, 28, 30-34

1. $(-9)^5$
2. 2^3n^2
4. $-\frac{1}{16}$
5. 100
6. p^7
7. n^{22}
9. $16k^4$
11. 5^{10}
12. w^4
14. $216c^2$
17. 1
19. 1
20. $\frac{1}{343}$
21. 1
23. 0.034
27. $625{,}000$
28. 3.6×10^{-4}
30. 7.92×10^7
31. 6.32×10^9
32. 4.1×10^{-4}
33. 3.773×10^4

34. 2×10^{-4}