

Chapter 4 Support File Answers

Practice 4-1

1. 1, 2, 3, 4, 6, 12 2. 1, 3, 5, 9, 15, 45 3. 1, 41
4. 1, 2, 3, 6, 9, 18, 27, 54 5. 1, 2, 3, 4, 6, 8, 12, 16, 24, 48 6. 1, 2, 4, 5, 10, 20, 25, 50, 100 7. 1, 3, 9, 13, 39, 117 8. 5 9. 2, 3, 9 10. 2, 5, 10 11. 3
12. 3, 5 13. 2, 3, 5, 9, 10 14. none 15. 3, 5, 9
16. 1 17. 3 18. 8 19. 0, 3, 6, 9 20. 0, 5
21. 0, 2, 4, 6, 8

Practice 4-2

1. 625 2. -125 3. -196 4. -64 5. 1
6. 729 7. 225 8. -3 9. 86 10. 3^4
11. k^5 12. $(-9)^3 m^3$ 13. $g^4 h$ 14. $7a^2 b^3$
15. $-16m^3 n^2$ 16. $(-3)^2 d^2 e^3$ 17. -8; -8
18. 0 19. 256; 256 20. 7 21. 12
22. -18 23. -150 24. 40 25. 28 26. 9
27. 4 28. -9

Practice 4-3

1. 4 2. 18 3. 9 4. 23 5. 1 6. 7 7. 6
8. $25xy$ 9. 3 10. 16 11. $12k^2$ 12. $2mn$
13. composite; $3 \cdot 5^2$ 14. composite; $2^3 \cdot 19$
15. composite; $2^4 \cdot 3^3$ 16. composite; $2^2 \cdot 3 \cdot 7^2$
17. composite; $2^5 \cdot 5$ 18. composite; $2^2 \cdot 3^3$
19. prime 20. composite; $11 \cdot 13$
21. composite; $3^2 \cdot 59$ 22. composite; $3^2 \cdot 41$
23. prime 24. prime 25. 15, 35, 21, 105
26. B

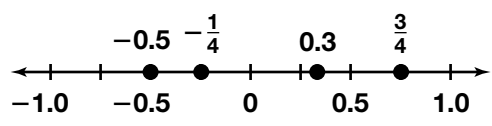
Practice 4-4

1. $\frac{2}{3}$ 2. $\frac{1}{2}$ 3. $\frac{3}{4}$ 4. $\frac{4}{5}$ 5. $\frac{2}{3}$ 6. $\frac{7}{9}$ 7. $\frac{4}{5y}$ 8. $\frac{4x}{5y}$
9. $\frac{3x}{8}$ 10. $\frac{6n}{7}$ 11. $\frac{1}{10}$ 12. $\frac{5h}{9k}$ 13. $\frac{n}{pm^4}$ 14. $\frac{1}{3h^2}$
15. $\frac{3h}{4k}$ 16. $\frac{5s}{4t^2}$ 17. $\frac{2}{8}, \frac{3}{12}$ 18. $\frac{4}{6}, \frac{6}{9}$ 19. $\frac{6}{10}, \frac{9}{15}$
20. $\frac{1}{6}, \frac{2}{12}$ 21. $\frac{1}{2}, \frac{2}{4}$ 22. $\frac{6m}{16n}, \frac{9m}{24n}$ 23. $\frac{1}{2pq^2}, \frac{pq}{2p^2q^3}$
24. $\frac{6s^2t^2}{14r}, \frac{3s^3t^3}{7rst}$ 25. $\frac{3}{5}$ 26. $\frac{1}{10}$

Practice 4-5

1. 12; P1-C3, P2-C3; P3-C1, P4-C1; P3-C2, P4-C2;
P3-C3, P4-C3 2. 12 3. 8 4. 16 5a. 15
b. 30

Practice 4-6

- 1-4. 
5. $\frac{4}{7}$ 6. $\frac{3}{5}$ 7. $\frac{3}{20}$ 8. $\frac{1}{3}$ 9. $-\frac{6}{7}$ 10. $\frac{19}{20}$ 11.-14.
Sample answers. 11. $-\frac{5}{7}, \frac{10}{14}, -\frac{10}{14}$ 12. $\frac{2}{3}, -\frac{2}{3}, \frac{4}{6}$
13. $\frac{4}{5}, -\frac{4}{5}, -\frac{24}{30}$ 14. $\frac{3}{8}, -\frac{3}{8}, -\frac{6}{16}$ 15. -1.7, $-\frac{34}{20}$
16. $\frac{12}{20}, -\frac{3}{5}, \frac{6}{10}$ 17. $\frac{4}{5}, \frac{40}{50}, \frac{8}{10}$ 18. 20 lb

Practice 4-7

1. 4 2. 9 3. 10 4. 3 5. 3 6. 8 7. z^{15}
8. $-m^{12}$ 9. -3^6 10. x^7 11. y^9 12. $-y^7$
13. $6y^5$ 14. $6x^{15}$ 15. m^{42} 16. $x^6 y^2$
17. $54x^{19}$ 18. h^{16} 19. $3p^6$ 20. $42z^8$ 21. =
22. < 23. > 24. = 25. < 26. = 27. =
28. > 29. <

Practice 4-8

1. 9 2. 4 3. -5 4. 2 5. -4 6. 4 7. $\frac{1}{a}$
8. $\frac{1}{j}$ 9. 1 10. $\frac{1}{k^4}$ 11. $\frac{3x^3}{4}$ 12. $2f^5$ 13. $\frac{y^8}{2}$
14. $\frac{1}{n^5}$ 15. $\frac{y^3}{3}$ 16. 1 17. $3h^5 k$ 18. $\frac{4}{b^6}$
19. a^{-3} 20. $2x^{-1} y$ 21. $x^{-6} y^2$ 22. $m^{-2} n^{-4}$
23. $2s^{-3} t$ 24. $3e^2 f^2$ 25. Answers may vary.
 $\frac{1}{4^5}, \frac{4^2}{4^7}, \frac{4^{-4}}{4}$

Practice 4-9

1. 37,700 2. 8,500 3. 0.00009002 4. 0.00191
5. 3.653×10^9 6. 6.336×10^4 7. 4.6×10^7
8. 7.725×10^7 9. 5.26×10^5 10. 8×10^9
11. 8.1×10^6 12. 7.3×10^{-7} 13. 9.03×10^{-4}
14. 6×10^7 15. 6×10^{14} 16. 7.2×10^{-7}
17. 8.5×10^{-2} 18. $23 \times 10^5, 6.9 \times 10^6,$
 72×10^5 19. $1.89 \times 10^{-4}, 2.5 \times 10^{-4},$
 19×10^{-3} 20. 3.125×10^{-5}
21. 3.1536×10^9

Reteaching 4-1

1. 17 2. 10, 25 3. 2, 4 4. 2, 4, 12 5. 1, 5, 11, 55
6. 1, 2, 4, 5, 8, 10, 20, 40 7. 1, 2, 3, 6, 7, 14, 21, 42
8. 1, 2, 3, 4, 6, 8, 12, 16, 24, 48

Chapter 4 Support File Answers (continued)

Reteaching 4-2

1. 10, 100 2. 10, -100 3. -10, 100 4. -10, -100 5. 5, 25, -75 6. 3, 9, 18, 14 7. 4, 8, 4, 16, 80 8. 7, 2, 7, 4, 28

Reteaching 4-3

1. $2 \cdot 5^2, 5 \cdot 7, 5$ 2. $3 \cdot 5^2, 2 \cdot 3 \cdot 5, 3 \cdot 5 = 15$
 3. $2^4 \cdot 3, 2^2 \cdot 3 \cdot 5, 2^2 \cdot 3 = 12$ 4. $3^2 \cdot 5, 2^3 \cdot 3^2, 3^2 = 9$ 5. $2 \cdot 7^2, 2 \cdot 3 \cdot 7, 2 \cdot 7 = 14$ 6. $2^3 \cdot 3, 2^4 \cdot 5, 2^3 = 8$ 7. $3^2 \cdot 5 \cdot 7, 2^3 \cdot 3^2 \cdot 5, 3^2 \cdot 5 = 45$ 8. $2^2 \cdot 3 \cdot 13, 2^4 \cdot 13, 2^2 \cdot 13 = 52$

Reteaching 4-4

1. $\frac{4}{11}$ 2. $\frac{2}{3}$ 3. $\frac{3}{7}$ 4. $\frac{5}{6}$ 5. $\frac{\frac{2 \cdot 3 \cdot 5 \cdot a \cdot a}{1 \cdot 2 \cdot 3 \cdot 5 \cdot a \cdot a} \cdot \frac{5a}{6b}}{1}$
 6. $\frac{\frac{2 \cdot 2 \cdot x \cdot x \cdot y \cdot y}{1 \cdot 2 \cdot 7 \cdot x \cdot y \cdot y} \cdot \frac{2x}{7y}}{1}$ 7. $\frac{\frac{2 \cdot 3 \cdot 3 \cdot x \cdot s \cdot s \cdot x \cdot y}{2 \cdot 2 \cdot 2 \cdot x \cdot x \cdot x} \cdot \frac{9s^2}{4}}{1}$
 8. $\frac{\frac{2 \cdot x \cdot p \cdot p \cdot r}{1 \cdot 2 \cdot p \cdot p \cdot r} \cdot \frac{2r}{p}}{1}$ 9. $\frac{11 \cdot \frac{x \cdot h \cdot h \cdot h}{1 \cdot x \cdot h \cdot h} \cdot 11h^2}{1}$
 10. $\frac{\frac{2 \cdot m \cdot m \cdot m}{2 \cdot 2 \cdot 2 \cdot m \cdot m \cdot m} \cdot \frac{1}{m \cdot n}}{1}$

Reteaching 4-5

1. steak, fries, beans; steak, fries, peas; chicken, mashed, beans; chicken, mashed, peas; chicken, fries, beans; chicken, fries, peas; hamburger, mashed, beans; hamburger, mashed, peas; hamburger, fries, beans; hamburger, fries, peas; 12 meals 2. 6

Reteaching 4-6

1. -2 2. 2 3. $\frac{1}{3}$ 4. $\frac{2}{7}$ 5. $-\frac{5}{2}$ 6. $\frac{2}{11}$ 7. $\frac{1}{2}$
 8. $-\frac{7}{3}$ 9. $\frac{23}{9}$ 10. $\frac{1}{4}$ 11. 5 12. $-\frac{3}{8}$ 13. -2
 14. -5 15. $-\frac{3}{4}$

Reteaching 4-7

1. $(4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4)(4 \cdot 4) = 4^9$
 2. $(a \cdot a \cdot a)(a \cdot a \cdot a \cdot a \cdot a \cdot a) = a^9$
 3. $(3 \cdot x \cdot x)(4 \cdot x \cdot x \cdot x \cdot x \cdot x) = 12x^7$
 4. $(3 \cdot 3 \cdot 3 \cdot 3) \cdot (3 \cdot 3 \cdot 3) = 3^7$
 5. $(y \cdot y \cdot y \cdot y \cdot y) \cdot (y \cdot y \cdot y) = y^8$
 6. $(7 \cdot r \cdot r \cdot r \cdot r \cdot r) \cdot (3 \cdot r \cdot r) = 21r^6$
 7. $5^3 \cdot 5^3 \cdot 5^3 \cdot 5^3 = 5^{12}$

$$8. h^2 \cdot h^2 \cdot h^2 \cdot h^2 \cdot h^2 = h^{10}$$

$$9. m^4 \cdot m^4 \cdot m^4 \cdot m^4 \cdot m^4 \cdot m^4 \cdot m^4 \cdot m^4 = m^{32}$$

$$10. x^3y^2 \cdot x^3y^2 \cdot x^3y^2 = x^9y^6$$

$$11. 2s^4t^5 \cdot 2s^4t^5 \cdot 2s^4t^5 \cdot 2s^4t^5 = 16s^{16}t^{20}$$

$$12. -pqr^2 \cdot (-pqr^2) \cdot (-pqr^2) = -p^3q^3r^6$$

Reteaching 4-8

1. 7^6 2. x^4 3. 1 4. $\frac{1}{n^3}$ 5. $\frac{y^4}{x^2}$ 6. $\frac{6}{a^3}$ 7. 1
 8. $\frac{1}{b^5}$ 9. $\frac{1}{y^7}$ 10. $\frac{7}{s^5t^3}$ 11. 3^{15} 12. 1 13. $\frac{1}{z^{27}}$
 14. $\frac{4e^3}{f^2}$

Reteaching 4-9

1. 7.45×10^8 2. 3.4×10^{-4} 3. 8.882×10^8
 4. 5.7×10^3 5. 5.92×10^{10} 6. 6×10^{-9}
 7. 1.0296×10^{10} 8. 3.45×10^2

Enrichment 4-1

1. yes 2. yes 3. no 4. yes 5. yes 6. no
 7. yes 8. yes 9. no 10. yes 11. yes
 12. no 13. yes 14. no 15. yes 16. yes
 17. can't tell 18. can't tell

Enrichment 4-2

1. 5, 25, 125, 2 2. 6, 36, 216, 6 3. 4, 16, 64, 256, 4, 6 4. 9; 81; 729; 6,561; 1; 9 5. 2, 4, 8, 16, 32, 64, 128, 256, 6, 8 6. 1; 121; 12,321; 1,234,321; 123,454,321; 12,345,654,321 7a. 9 7b. 7 7c. 3
 7d. 1

Enrichment 4-3

1. 1, 23 2. 1, 2, 3, 4, 6, 8, 12, 24 3. 2 4. 8
 5. $2^2 \cdot 11$; 6; 1, 2, 4, 11, 22, 44 6. $7 \cdot 13$; 4; 1, 7, 13, 91 7. 5^3 ; 4; 1, 5, 25, 125 8. $2 \cdot 3^3$; 8; 1, 2, 3, 6, 9, 18, 27, 54 9. $2^3 \cdot 83$; 8; 1, 2, 4, 8, 83, 166, 332, 664
 10. $3^2 \cdot 41$; 6; 1, 3, 9, 41, 123, 369
 11. $5^2 \cdot 19$; 6; 1, 5, 19, 25, 95, 475 12. $2 \cdot 3 \cdot 37$; 8; 1, 2, 3, 6, 37, 74, 111, 222

Enrichment 4-4

1. 1; 1; 11; 11 2. 3; 3; 21; 21; 15; 15 3. 10; 10; 6; 6; 4; 4 4. 4; 4; 12; 12; 9; 9 5. 5; 5; 36; 36; 1; 1
 6. 8; 8; 32; 32; 11; 11 KODIAK

Chapter 4 Support File Answers (continued)

Enrichment 4-5

- 1a. 1 1b. 2 1c. 1 2a. 1 2b. 3 2c. 3
 2d. 1 3a. 2; 3 3b. The number of outcomes when a coin is tossed n times is 2^n . 4. 16
 5. Each entry is the sum of the two entries above.
 6. They are the same. 7. 6

Enrichment 4-6

1. 3, 3 2. 6, 6 3. $-7, -7$ 4. Answers may vary. 6, 1, 5, 5 5. Answers may vary. 12, 2, 10, 10
 6. $\frac{m^2 - n^2}{m + n} = m - n$ 7. For $a = 2, 4, 7$, and 10, answers are 7, 9, 12, and 15, respectively. The last 3 answers will vary. Each must be 3 more than the corresponding value chosen for a .
 8. $\frac{a^2 - 2a - 15}{a - 3} = a + 5$ 9. You cannot evaluate the fraction because the denominator equals zero. The fraction is undefined.

Enrichment 4-7

1. $9^{(9^9)}$ 2a. 2^{20} 2b. 1,000,000 3. C 4. J
 5. D 6. J 7a. 2^1 7b. 2^2 7c. 2^{50} 8. J

Enrichment 4-8

1. 42, 41; 44, 40, 36; 39, 38, 43; 120 2. $-17, -12, -13; -10, -14, -18; -15, -11; -42$ 3. $-8, -3, -4; -1, -9; -6, -7, -2; -15$ 4. 64 5. $\frac{1}{4}, 8, 4; 2, \frac{1}{8}, 1, \frac{1}{2}, 16; 8$ 6. $\frac{1}{16}, 2, 1; 8, \frac{1}{2}, \frac{1}{32}, \frac{1}{4}, 4; \frac{1}{8}$ 7. $\frac{1}{8}, 4, 2; 16, 1, \frac{1}{16}, \frac{1}{4}, 8; 1$

Enrichment 4-9

1. 2×10^4 mi/h 2. 2.4×10^5 mi
 3a. 2.4×10^4 h 3b. 4.8×10^8 mi
 3c. 1,000 days 4. 2.5×10^{13} mi
 5. 6.25×10^{17} mi

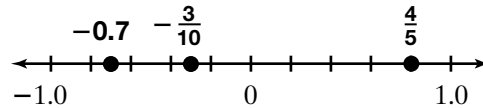
Checkpoint 1

1. 3 only 2. 2 and 3 3. 2, 3, 5, 9, and 10 4. 49
 5. -1 6. -75 7. $\frac{4}{5}$ 8. $\frac{2}{3}$ 9. $\frac{1}{2}$ 10. Answers may vary. Samples are given. $6x^2$ and $9x^3; 9x^2$ and $3x^3$

Checkpoint 2

1. Answers may vary. $-\frac{2}{9}, \frac{4}{18}, -\frac{4}{18}$ 2. Answers may vary. $-\frac{8}{10}, \frac{4}{5}, -\frac{4}{5}$ 3. $-\frac{1}{5}$ 4. -1 5. $\frac{1}{3}$

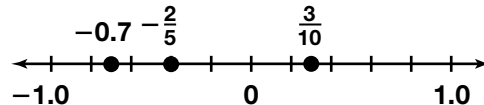
6-8.



9. 5^{11} 10. a^{12} 11. $\frac{y^3}{x^2}$ 12. $\frac{3}{4}$

Chapter 4 Test Form A

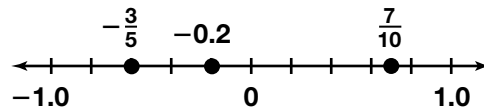
1. C 2. J 3. B 4. F 5. D 6. F 7. B
 8. H 9. D 10. J 11. B 12. 1, 2, 5, 10, 11, 22, 55, 110 13. composite; $3^2 \cdot 7$ 14. prime
 15. 1 16. $2xy^2$ 17. $\frac{3}{5}$ 18. $\frac{m^2n}{2}$
 19-21.



22. $-\frac{2}{3}$ 23. 5.4×10^9 24. 24 25. Answers may vary. $\frac{2^2}{2^5} = 2^{2-5} = 2^{-3}$.
 Also, $\frac{2^2}{2^5} = \frac{2 \cdot 2}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2} = \frac{1}{2^3}$. So, $2^{-3} = \frac{1}{2^3}$ since $\frac{2^2}{2^5}$ cannot have two different values.

Chapter 4 Test Form B

1. A 2. G 3. C 4. G 5. D 6. J 7. A
 8. H 9. D 10. G 11. C 12. 1, 2, 5, 7, 10, 14, 35, 70 13. prime 14. composite; $3^2 \cdot 11$
 15. 2 16. $3xy^3$ 17. $\frac{7}{8}$ 18. $\frac{m^3n^2}{3}$
 19-21.



22. $-\frac{1}{4}$ 23. 8.4×10^8 24. 12
 25. $(-b)^2 = (-b)(-b) = b^2$ since the product of two negative numbers is positive.

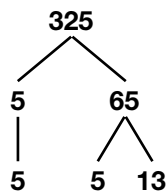
Alternative Assessment

1. Answers may vary. $\frac{7}{7} = 1$ and $\frac{7^1}{7^1} = 7^{1-1} = 7^0$; $\frac{7}{7}$ cannot have two different values, therefore $7^0 = 1$.
 2. $(-3)^2 = (-3)(-3) = 9$ and

Chapter 4 Support File Answers (continued)

$-3^2 = -(3 \cdot 3) = -9$; $(-3)^2$ is (-3) squared whereas -3^2 is the opposite of 3^2 . **3.** Add the exponents; $x^2 \cdot x^4 \cdot x = x^{2+4+1} = x^7$

4. $5^2 \cdot 13$ **5.** $\frac{m}{m+n} = \frac{4}{4+10}$ Substitute.



$= \frac{4}{14}$ Simplify.

$= \frac{2 \cdot 2}{2 \cdot 7}$ Factor.

$= \frac{2}{7}$ Remove common factors.

6. Start with the greatest number of quarters, 2. Then find all the ways with 1 quarter and 2 dimes, then with 1 quarter and 1 dime, and so on. There are 13 ways.

Quarters	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Dimes	0	2	2	1	1	1	1	0	0	0	0	0	0	0
Nickels	0	1	0	3	2	1	0	5	4	3	2	1	0	0
Pennies	0	0	5	0	5	10	15	0	5	10	15	20	25	25

Cumulative Review

1. B **2.** J **3.** A **4.** F **5.** C **6.** J **7.** B

8. H **9.** B **10.** J **11.** C **12.** F **13.** D

14. J **15.** B **16.** G **17.** $6(x+3)$; 48

18. $\frac{n}{3.2} = -0.25$, $n = -0.8$ **19.** 1, 2, 4, 7, 8, 14, 28, 56

20. poached egg with orange juice and toast, poached egg with tomato juice and toast, scrambled egg with orange juice and toast, scrambled egg with tomato juice and toast, fried egg with orange juice and toast, fried egg with tomato juice and toast; There are 6 combinations. List them in an organized way.