Chapter 4

Multiple Choice In Exercises 1-7, choose the letter of the correct answer.

1. Which expression is equivalent to $x \cdot x \cdot y \cdot y \cdot y$? *(Lesson 4.1)*

   A. $6xy$ **B.** $x^2 y^3$ **C.** $2xy^3$ **D.** $3x^2 y$

2. What is the greatest common factor of $6mn$ and $27m^3$? *(Lesson 4.2)*

   F. $3m$ **G.** $3m^3 n$ **H.** $6m$ **I.** $54m^3 n$

3. Which expression is equivalent to $\dfrac{18a^6}{3a^2}$? *(Lesson 4.3)*

   A. $6a^3$ **B.** $6a^4$ **C.** $15a^3$ **D.** $15a^4$

4. What is the LCM of 32 and 48? *(Lesson 4.4)*

   F. 6   **G.** 48   **H.** 96   **I.** 144

5. Which expression is equivalent to $-2x^2 \cdot 3x^3 y$? *(Lesson 4.5)*

   A. $-6x^5 y$ **B.** $-6x^2 y$ **C.** $-6x^6 y$ **D.** x^2

6. Which list of numbers is ordered from least to greatest? *(Lesson 4.6)*

   F. $3^{-2}, 5^0, 2^{-3}, -7$ **G.** $2^{-3}, 3^{-2}, -7, 5^0$

   H. $-7, 3^{-2}, 5^0, 2^{-3}$ **I.** $-7, 3^{-2}, 2^{-3}, 5^0$

7. Which number is equivalent to 8×10^{-3}? *(Lesson 4.7)*

   A. 8000   **B.** 800   **C.** 0.08   **D.** 0.008

8. **Short Response** You are arranging 60 pictures on a poster board. The board can fit up to 4 rows of pictures, and each row can have up to 20 pictures. You want each row to have the same number of pictures. How many different ways can you arrange the pictures? *(Lesson 4.1)*

9. **Extended Response** The table shows the typical lengths of four species of roundworm. *(Lesson 4.7)*

Roundworm	Length (m)
Monochus	3.4×10^{-3}
Cephalobus	6×10^{-4}
Placentonema gigantissima	7.9×10^0
Syphacia peromysci	9.1×10^{-4}

   a. Order the lengths from least to greatest.

   b. How many meters less is the length of the shortest roundworm than the length of the next shortest roundworm? Write your answer in standard form and in scientific notation.

Chapter 5

Multiple Choice In Exercises 10–16, choose the letter of the correct answer.

10. Which fraction is equivalent to 0.8? *(Lesson 5.1)*

    A. $\dfrac{9}{10}$ **B.** $\dfrac{8}{9}$ **C.** $\dfrac{6}{7}$ **D.** $\dfrac{4}{5}$

11. Your pants have a length of 30 inches. A tailor cuts off $2\frac{1}{3}$ inches from the length so that the pants fit you. How long are the pants now? *(Lesson 5.2)*

    F. $27\frac{1}{3}$ inches   **G.** $27\frac{2}{3}$ inches

    H. $28\frac{1}{3}$ inches   **I.** $28\frac{2}{3}$ inches

12. Simplify the expression $\dfrac{a}{3} + \dfrac{3a}{4}$. *(Lesson 5.3)*

    A. $\dfrac{4a}{7}$ **B.** $\dfrac{13a}{12}$ **C.** $\dfrac{a}{3}$ **D.** $\dfrac{7a}{12}$

13. Simplify the expression $\frac{6r}{5} \cdot \frac{15r}{2}$. *(Lesson 5.4)*

   F. $9r$ **G.** $9r^2$ **H.** $\frac{4r}{25}$ **I.** $\frac{4r^2}{25}$

14. Find the quotient $\frac{3}{4} \div 1\frac{7}{8}$. *(Lesson 5.5)*

   A. $\frac{1}{3}$ **B.** $\frac{2}{5}$ **C.** $\frac{2}{3}$ **D.** $1\frac{1}{14}$

15. Your friend buys a skateboard that is on sale for one third off the original price. Your friend spent $36 less than the original price. What was the original price of the skateboard? *(Lesson 5.6)*

   F. $12   **G.** $72   **H.** $108   **I.** $144

16. Which number is *not* a solution of the inequality $-\frac{3}{4}x - \frac{1}{4} \le 3$? *(Lesson 5.7)*

   A. $-4\frac{2}{3}$ **B.** $-3\frac{1}{3}$ **C.** $3\frac{1}{3}$ **D.** $4\frac{2}{3}$

17. **Short Response** You agree to donate $.10 for every $\frac{1}{4}$ mile that your friend runs in a race for charity. If your friend runs 15 miles, how much money will you donate? Explain your reasoning. *(Lesson 5.6)*

18. **Extended Response** You have $1275.25 to buy stock in a company. Your stockbroker charges a brokerage fee of $12.75 for each transaction. Each share is currently worth $25.75. *(Lesson 5.7)*

   a. How many shares can you buy in one transaction?

   b. You save $800 to buy more stock. Each share is now worth $31.49. How many shares can you buy in one transaction of $800?

   c. Suppose that the shares in parts (a) and (b) are now worth $28.36 each. What is the total value of the shares? Explain your reasoning.

Chapter 6

Multiple Choice In Exercises 19–25, choose the letter of the correct answer.

19. Which rate is equivalent to $\frac{40 \text{ m}}{1 \text{ sec}}$? *(Lesson 6.1)*

   A. $\frac{2.4 \text{ km}}{1 \text{ h}}$ **B.** $\frac{24 \text{ km}}{1 \text{ h}}$

   C. $\frac{144 \text{ km}}{1 \text{ h}}$ **D.** $\frac{1440 \text{ km}}{1 \text{ h}}$

20. You can buy 3 pens for $2. How much money will you spend if you buy 15 pens? *(Lesson 6.2)*

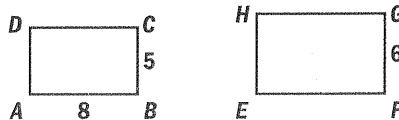   **F.** $10   **G.** $15   **H.** $30   **I.** $60

21. What is the solution of the proportion $\frac{8}{y} = \frac{5}{7}$? *(Lesson 6.3)*

   A. 5.4   **B.** 5.7   **C.** 6   **D.** 11.2

22. Given $\triangle ABC \sim \triangle DEF$, which statement is *not* necessarily true? *(Lesson 6.4)*

   F. $\angle A \cong \angle D$ **G.** $\overline{AC} \cong \overline{DF}$

   H. $\frac{AB}{DE} = \frac{AC}{DF}$ **I.** $\frac{AB}{DE} = \frac{BC}{EF}$

23. Rectangle $ABCD$ is similar to rectangle $EFGH$. What is the length of $\overline{EF}$? *(Lesson 6.5)*

   A. 6.3   **B.** 7.5   **C.** 9   **D.** 9.6

24. An airplane is 38.75 feet tall. A model of the airplane is 7.75 inches tall. What is the scale used for the model? *(Lesson 6.6)*

   F. 1 in. : 0.2 ft   **G.** 1 in. : 5 ft

   H. 5 in. : 1 ft   **I.** 7 in. : 38 ft

Cumulative Practice continued

25. You roll a number cube. What are the odds in favor of rolling a number less than 3? (Lesson 6.7)

    A. 1 to 3 B. 1 to 2 C. 3 to 7 D. 3 to 5

26. **Short Response** You can do 45 sit-ups in a minute. Your friend can do 40 sit-ups in a minute. At these rates, how many more sit-ups can you do than your friend in 4.5 minutes? Explain your steps. (Lesson 6.1)

27. **Extended Response** Six numbers are written on slips of paper and placed in one of two hats, as shown. You randomly choose a number from each hat. (Lesson 6.8)

    First hat   **Second hat**

    | 2 | 6 | 7 | | 4 | 5 | 9 |

    a. Use a tree diagram to list all the possible outcomes of choosing two numbers.

    b. What is the probability that the sum of the two numbers you choose is even?

    c. The number 3 is written on a slip of paper and placed in the first hat. Does the probability of choosing two numbers whose sum is even *increase*, *decrease*, or *stay the same*? Explain.

Chapter 7

Multiple Choice In Exercises 28–34, choose the letter of the correct answer.

28. What is 40% of 2100? (Lesson 7.1)

    A. 84   B. 525   C. 840   D. 2060

29. 6 is what percent of 16? (Lesson 7.2)

    F. $2\frac{2}{3}\%$ G. $37\frac{1}{2}\%$ H. 96%   I. 267%

30. What is 3.4% of 8700? (Lesson 7.3)

    A. 29.58   B. 295.8   C. 2958   D. 29,580

31. 27 is 18% of what number? (Lesson 7.4)

    F. 4.86   G. 45   H. 48.6   I. 150

32. What is the new amount when 70 is increased by 30%? (Lesson 7.5)

    A. 73   B. 91   C. 100   D. 2100

33. You are ordering pizzas for home delivery. The pizzas cost $18. The sales tax is 6%, and you plan to give a 15% tip. What is the total cost of the order? (Lesson 7.6)

    F. $18.21 G. $20.10 H. $21.78 I. $37.80

34. You deposit $1000 into an account that earns 10% interest compounded annually. What is the balance of the account after 2 years? (Lesson 7.7)

    A. $1200 B. $1210 C. $1800 D. $3528

35. **Short Response** A computer is on sale for 25% off the original price of $800. You must pay a sales tax of 6.5% of the sale price. How much money do you spend for the computer? Explain your steps. (Lesson 7.6)

36. **Extended Response** Suppose you deposit $500 into an account that earns 3% simple annual interest, and your friend deposits $400 into an account that earns 5% simple annual interest. (Lesson 7.7)

    a. Copy and complete the table.

Years	Your account balance	Your friend's account balance
1	?	?
3	?	?
5	?	?
10	?	?

    b. After how many years will the balance in your friend's account equal the balance in your account? Explain your reasoning.

Cumulative Practice for Chapters 8–10

Chapter 8

Multiple Choice In Exercises 1–9, choose the letter of the correct answer.

1. What is the domain of the relation $(-9, 4)$, $(-3, -2)$, $(3, 7)$, $(8, 5)$? *(Lesson 8.1)*

   A. $3, 8$ **B.** $-9, -3, 3, 8$

   C. $4, -2, 7, 5$ **D.** $7, 5$

2. What is the range of the relation in Exercise 1? *(Lesson 8.1)*

   F. $3, 8$ **G.** $-9, -3, 3, 8$

   H. $4, -2, 7, 5$ **I.** $7, 5$

3. Which ordered pair is *not* a solution of the equation $3x + 4y = 14$? *(Lesson 8.2)*

   A. $(-10, 11)$ **B.** $(2, 2)$

   C. $(6, 8)$ **D.** $(10, -4)$

4. What is the y-intercept of the graph of $-6x - 3y = 18$? *(Lesson 8.3)*

   F. -6 **G.** -3 **H.** 3 **I.** 6

5. What is the x-intercept of the graph of the equation in Exercise 4? *(Lesson 8.3)*

   A. -6 **B.** -3 **C.** 3 **D.** 6

6. What is the slope of the line through the points $(6, -4)$ and $(9, 3)$? *(Lesson 8.4)*

   F. $-\frac{7}{3}$ **G.** $-\frac{3}{7}$ **H.** $\frac{3}{7}$ **I.** $\frac{7}{3}$

7. What is an equation of the line that has a slope of -4 and passes through the point $(0, 7)$? *(Lesson 8.6)*

   A. $y = -4x - 7$ **B.** $y = -4x + 7$

   C. $y = 7x - 4$ **D.** $y = 7x + 4$

8. Which ordered pair is a solution of the linear system $x + 4y = 18$ and $-3x + 2y = 16$? *(Lesson 8.8)*

   F. $(-2, -5)$ **G.** $(-2, 5)$

   H. $(2, 5)$ **I.** $(2, -5)$

9. The graph of which inequality is shown? *(Lesson 8.9)*

   A. $y > -3x - 6$

   B. $3x - y < 6$

   C. $x + 3y \geq -18$

   D. $y \leq -\frac{1}{3}x - 6$
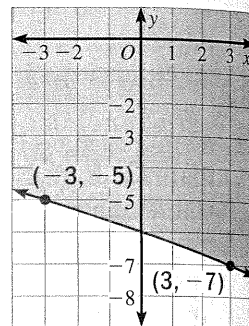
10. **Short Response** Find the slope of a line perpendicular to the line $-5x + 2y = 16$. Then find an equation of a line that is perpendicular to the line $-5x + 2y = 16$ and passes through the point $(5, 7)$. *(Lesson 8.5)*

11. **Extended Response** A computer repair shop charges a flat rate of $50 plus $35 per hour spent repairing each computer. *(Lesson 8.7)*

   a. Let h be the number of hours spent repairing a computer. Use function notation to write an equation that gives the total charges for repairing a computer as a function of h. Graph the function.

   b. How much will the repair shop charge if the shop does 2.5 hours of work?

   c. The repair shop charges $172.50 to repair a computer. How many hours did the shop work on the computer?

Chapter 9

Multiple Choice In Exercises 12–22, choose the letter of the correct answer.

12. What is the value of $\sqrt{y^2 - z}$ when $y = -6$ and $z = 3$? (Lesson 9.1)

    A. $\sqrt{15}$ **B.** $\sqrt{33}$ **C.** 15   **D.** 33

13. Which expression is *not* equivalent to $\sqrt{32}$? (Lesson 9.2)

    F. $4\sqrt{2}$ **G.** $\sqrt{2 \cdot 4^2}$ **H.** $16\sqrt{2}$ **I.** $\sqrt{2 \cdot 16}$

14. The length of the hypotenuse of a right triangle is 32.5 centimeters, and the length of one leg is 12.5 centimeters. What is the length of the other leg? (Lesson 9.3)

    A. 25 cm   **B.** 30 cm   **C.** 35 cm   **D.** 900 cm

15. Which list of numbers is in order from least to greatest? (Lesson 9.4)

    F. $-2.4, -\sqrt{6}, \sqrt{5}, \frac{7}{3}$ **G.** $-2.4, -\sqrt{6}, \frac{7}{3}, \sqrt{5}$

    H. $-\sqrt{6}, -2.4, \sqrt{5}, \frac{7}{3}$ **I.** $-\sqrt{6}, -2.4, \frac{7}{3}, \sqrt{5}$

16. What is the midpoint of the segment with endpoints $(-3, 4)$ and $(6, -2)$? (Lesson 9.5)

    A. $(1\frac{1}{2}, 1)$ **B.** $(-1\frac{1}{2}, 1)$

    C. $(4\frac{1}{2}, 3)$ **D.** $(-4\frac{1}{2}, 3)$

17. The length of each leg of a 45°-45°-90° triangle is 7 meters. What is the length of the hypotenuse? (Lesson 9.6)

    F. 2.6 m   **G.** 4.9 m   **H.** 7 m   **I.** $7\sqrt{2}$ m

18. The length of the hypotenuse of a 30°-60°-90° triangle is 11 inches. What is the length of the shorter leg? (Lesson 9.6)

    A. 5.5 in.   **B.** $\frac{11\sqrt{3}}{2}$ in.

    C. $11\sqrt{3}$ in.   **D.** 22 in.

19. Which ratio is equal to tan A? (Lesson 9.7)
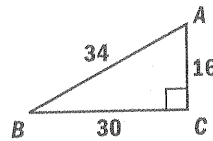
    F. $\frac{16}{34}$ **G.** $\frac{16}{30}$

    H. $\frac{30}{34}$ **I.** $\frac{30}{16}$

20. Which ratio is equal to tan B for the triangle in Exercise 19? (Lesson 9.7)

    A. $\frac{16}{34}$ **B.** $\frac{16}{30}$ **C.** $\frac{30}{34}$ **D.** $\frac{30}{16}$

21. Which ratio is equal to sin B for the triangle in Exercise 19? (Lesson 9.8)

    F. $\frac{16}{34}$ **G.** $\frac{16}{30}$ **H.** $\frac{30}{34}$ **I.** $\frac{30}{16}$

22. Which ratio is equal to sin A for the triangle in Exercise 19? (Lesson 9.8)

    A. $\frac{16}{34}$ **B.** $\frac{16}{30}$ **C.** $\frac{30}{34}$ **D.** $\frac{30}{16}$

23. **Short Response** The time t (in seconds) that it takes a dropped object to fall a distance d (in feet) is given by the formula $d = 16t^2$. Two balls are dropped from the tops of two buildings. The heights of the two buildings are 150 feet and 600 feet. How much longer does it take the ball dropped from the taller building to hit the ground? Show your work. (Lesson 9.2)

24. **Extended Response** The vertices of an isosceles triangle are $P(6, 5)$, $Q(-4, 3)$, and $R(2, -1)$. (Lessons 9.3, 9.5)

    a. Graph the triangle.

    b. Find the lengths of $\overline{PQ}$, $\overline{QR}$, and $\overline{RP}$.

    c. Find the midpoint M of $\overline{PQ}$.

    d. Find the distance between points M and R.

    e. Use the converse of the Pythagorean theorem to show that $\triangle MQR$ and $\triangle PMR$ are right triangles.
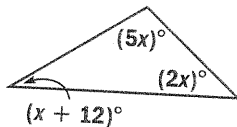
Cumulative Practice continued

Chapter 10

Multiple Choice In Exercises 25–32, choose the letter of the correct answer.

25. What is the value of x? (Lesson 10.1)
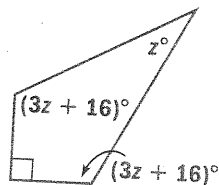
A. 10.5 **B.** 21

C. 24 **D.** 42

(5x)°
(2x)°
(x + 12)°

26. Classify the triangle in Exercise 25 by its angle measures. (Lesson 10.1)

F. Acute **G.** Isosceles

H. Obtuse **I.** Right

27. What is the value of z? (Lesson 10.2)

A. 34 **B.** 90

C. 118 **D.** 208

z°
(3z + 16)°
(3z + 16)°

28. Your garden is in the shape of a parallelogram. The height of the parallelogram is 18 feet. The base is $1\frac{1}{2}$ times the height. What is the area of the garden? (Lesson 10.3)

F. 18 ft² **G.** 40.5 ft²

**H.** 216 ft² **I.** 486 ft²

29. The area of a circle is 94.2 square centimeters. What is the approximate radius of the circle? (Lesson 10.4)

A. 3.9 cm **B.** 5.5 cm **C.** 15 cm **D.** 30 cm

30. A box has the shape of a rectangular prism that is 15 centimeters long, 4.5 centimeters wide, and 22 centimeters high. What is the surface area of the prism? (Lesson 10.5)

F. 41.5 cm **G.** 496.5 cm²

H. 993 cm² **I.** 1485 cm³

31. What is the surface area of the square pyramid shown? (Lesson 10.6)

51 in.
136 in.
136 in.
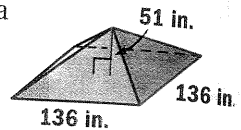
A. 23,256 in.² **B.** 32,368 in.²

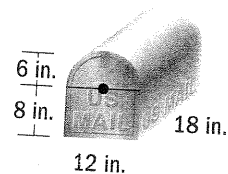**C.** 41,616 in.² **D.** 314,432 in.²

32. A mailbox is composed of a prism and a half cylinder. What is the approximate volume of the mailbox? (Lessons 10.7, 10.8)

F. 1148 in.³

G. 1778 in.³

H. 2036 in.³

I. 2746 in.³

6 in.
8 in.
18 in.
12 in.

33. Short Response The area of a trapezoid is 225 square meters. The height of the trapezoid is 25 meters. One of the bases is twice the other base. Do you have enough information to find each of the bases? If so, find the bases. If not, explain why not. (Lesson 10.3)

34. Extended Response A cylindrical display tank at an aquarium has a cylindrical viewing chamber inside it. Water fills the space between the two glass cylinders, as shown. (Lesson 10.7)

a. What is the volume of the water in the tank to the nearest cubic inch?

20 in.
26 in.
72 in.
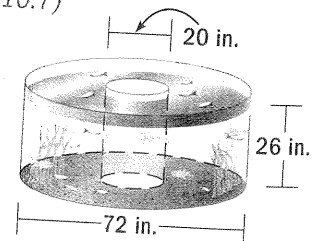
b. How many gallons of water are needed to fill the tank? Use the fact that 1 cubic inch of water is approximately equal to 0.00433 gallon.