1. A bag contains 5 blue marbles and 5 green marbles. Is the likelihood of choosing a blue marble impossible, likely, unlikely, or equally likely?

2. Joseph places three cards that are labeled 1 to 3 face down on the table and mixes them up. Is the likelihood that his friend Drew will draw an even numbered card impossible, likely, unlikely, or equally likely?

3. The results of a survey show that basketball is the favorite sport for 15 out of 50 people. What is the experimental probability that a person’s favorite sport will not be basketball?

4. On the last math test in Gregory’s class, 10 out of 25 students scored an 90 or higher. Which percent is closest to the experimental probability that a student selected at random will score an 90 or higher on the next test?

5. During her first 10 picks from a bag of marbles, Mary chose 3 yellow marbles, 5 green marbles, and 2 blue marbles. Each time she replaces the marble before selecting another. Which percent is closest to the experimental probability that Mary will choose a green marble on her next pick?

6. Brian rolls a number cube and spins a spinner with two equal sections. How many outcomes are possible?

7. Denise’s sandwich shop offers a lunch special on sandwiches on white, oatmeal, and rye breads. You can also choose between turkey, egg salad, and chicken. How many different sandwiches can you make for the lunch special?

8. Two number cubes are rolled and the results are added. What is the probability that the sum is equal to 12?

9. Yvonne spins a spinner that is split into 6 equal sections. The sections are labeled 3, 1, 2, 3, 2, 3. What is the probability that the spinner will land on the number 1?
Free Response

10. A bag contains 3 red marbles and 1 yellow marble. What is the probability of drawing a red marble, then replacing that marble, then drawing a red marble again on the second pick?

11. A bag contains 2 blue marbles and 2 green marbles. What is the probability of drawing a blue marble followed by a green marble, without replacing the first marble before drawing the second marble?

12. Charlene rolls a number cube and then chooses a card from a set of cards numbered 1 through 3. What is the probability that she will roll an even number and choose an odd numbered card?

13. Sari packs 2 mugs into a gift box. She has 4 colors of mugs to choose from: red, green, white, or blue. How many combinations of two different color mugs can she pack into the box?

14. Judy is ordering a pizza with 3 toppings. She has 4 toppings to choose from: pepperoni, mushroom, olives, and bell peppers. How many possible combinations of 3 different toppings can she choose?

15. A juice store allows you to make your own juice using a combination of any 4 fruits. The available fruits are strawberries, bananas, apples, raspberries, and oranges. How many combination juices with 4 different fruits could you make?

16. How many different ways can 4 paintings be arranged in a row?

17. How many different orders can 5 people stand in line for movie tickets?
Cumulative Test

Choose the best Answer.

1. Find the value of $5^2 + 5^3$.
   A 25  C 150
   B 125  D 3125

2. Which is $3,589 \times 10^3$ in scientific notation?
   F $3,589 \times 10^3$  H $35.89 \times 10^5$
   G $3.589 \times 10^6$  J $3.589 \times 10^2$

3. Evaluate $3 + 4(5 - 2)^2 - 4$.
   A 23  C 50
   B 35  D 83

4. Find the prime factorization of 525.
   F $3^2 \cdot 5 \cdot 7$
   G $3 \cdot 5^2 \cdot 7$
   H $5 \cdot 7 \cdot 15$
   J $3 \cdot 5 \cdot 21$

5. Find the greatest common factor of 18, 36, and 60.
   A 2  C 6
   B 3  D 18

6. Find the least common multiple of 6, 18, and 24.
   F 24  H 144
   G 72  J 2,592

7. Which expression simplifies to $3x + y$?
   A $5y + 6x - 2y - 9x + 4x$
   B $2x + 6y - 5x - 11y + 4y$
   C $5x - 6y - 2x + 11y - 4y$
   D $5x + 6y - 2x - 7y$

8. Solve the equation $x - 17 = 18$.
   F 1  H 21
   G 11  J 35

9. Start at the origin. Give the coordinates of the point 2 units left and 4 units up.
   A (2, 4)  C (−2, 4)
   B (2, −4)  D (−2, −4)

10. Find the sum of $−3 + 24 + (−12)$.
   F −9  H 33
   G 9  J 39

11. A submarine rose from a depth of 287 feet to a depth of 65 feet. What is the difference in these depths?
   A −222 ft  C −352 ft
   B 222 ft  D 352 ft

12. The three angles of a triangle add up to 180°. If two angles are 57° and 84°, what is the measure of the third angle?
   F 39°  H 123°
   G 96°  J 141°

13. Which shows $\frac{25}{7}$ as a mixed number?
   A $2\frac{5}{7}$  C $4\frac{3}{7}$
   B $3\frac{4}{7}$  D $7\frac{3}{4}$

14. Convert $−0.33$ to a fraction in simplest form.
   F $−\frac{1}{3}$  H $−\frac{3}{10}$
   G $−\frac{1}{33}$  J $−\frac{33}{100}$
   A \(-28\) C \(14\)
   B \(-14\) D \(28\)

16. Heather is learning a new song on the guitar. It takes 0.6 hour to learn the verses and 1.5 hours to learn the chorus. What is the total time to learn the song?
   F 0.7 hour H 1.5 hours
   G 0.9 hour J 2.1 hours

17. Multiply 12.32 \(\times\) 8.75.
   A 0.1078 C 21.07
   B 10.78 D 107.8

18. A dinner bill of $48.75 is split three ways. How much does each person pay?
   F $16.25 H $48.75
   G $45.75 J $146.25

19. It took 3.3 hours for Marianne to drive 178.2 miles. What was her average speed for the trip?
   A 54 mi/h C 59.3 mi/h
   B 55 mi/h D 60 mi/h

20. Solve the equation \(-2.8k = 7\).
   F \(-19.6\) H \(2.5\)
   G \(-2.5\) J \(19.6\)

21. On average, elementary school students spend \(\frac{1}{6}\) of their day at recess or lunch. If they are in school \(6\frac{1}{2}\) hours a day, how much time is spent in recess or lunch?
   A \(\frac{1}{6}\) hour C \(1\frac{1}{12}\) hours
   B 1 hour D 2 hour

22. Colin has \(5\frac{1}{2}\) gallons of water available. How many \(\frac{1}{8}\) gallon water bottles can he fill with this water?
   F \(\frac{11}{16}\) H 24
   G \(\frac{3}{8}\) J 44

23. Estimate \(8\frac{7}{16} + 4\frac{2}{25}\).
   A \(4\frac{1}{2}\) C \(12\frac{1}{2}\)
   B 12 D 13

24. Add or subtract \(\frac{3}{8} + \frac{2}{3} - \frac{5}{6}\). Which is the answer in simplest form?
   F \(-\frac{5}{24}\) H 0
   G \(\frac{5}{24}\) J \(\frac{15}{8}\)

25. One recipe calls for \(2\frac{1}{4}\) cups of sugar, and a second uses \(1\frac{1}{3}\) cups. How much sugar will it take for both recipes?
   A 3 cups C \(3\frac{7}{12}\) cups
   B \(3\frac{2}{7}\) cups D 4 cups
26. Solve \( h - \frac{2}{5} = \frac{3}{10} \). Which is the answer in simplest form?
   - **F** \( \frac{1}{10} \)
   - **G** \( \frac{1}{5} \)
   - **H** \( \frac{1}{3} \)
   - **J** \( \frac{7}{10} \)

27. The Math Club has 8 boys, 11 girls, and 2 advisors. Which shows the ratio of boys to girls in all three forms?
   - **A** \( \frac{8}{11}, 8 \text{ to } 11, 8:11 \)
   - **B** \( \frac{11}{8}, 11 \text{ to } 8, 11:8 \)
   - **C** \( \frac{8}{11}, 8 \text{ to } 11, 8:11 \)
   - **D** \( \frac{8}{3}, 8 \text{ to } 3, 8:3 \)

28. Which ratio is equivalent to the ratio 4 to 9?
   - **F** \( \frac{5}{10} \)
   - **G** \( \frac{12}{18} \)
   - **H** 16:36
   - **J** 2:3

29. Use cross products to solve the proportion \( \frac{3}{x} = \frac{12}{18} \).
   - **A** 2
   - **B** 4
   - **C** 6
   - **D** 9

30. Convert 72 inches into yards.
   - **F** 1 yd
   - **G** 2 yd
   - **H** 6 yd
   - **J** 14 yd

31. Which shows 58% as a decimal and a fraction in simplest form?
   - **A** 58.0, \( \frac{29}{50} \)
   - **B** 0.58, \( \frac{58}{100} \)
   - **C** 0.58, \( \frac{29}{50} \)
   - **D** 0.29, \( \frac{29}{50} \)

32. Last season, Ken made 73% of his free throws. If he attempted 59 free throws all season, estimate how many free throws he made.
   - **F** 15
   - **G** 38
   - **H** 45
   - **J** 60

33. Fifteen percent of hockey-stick sales are to women. If 220 sticks were sold, how many were purchased by women?
   - **A** 15 sticks
   - **B** 30 sticks
   - **C** 33 sticks
   - **D** 147 sticks

34. Alicia already spent $8.25 of her paycheck. If this was 15% of her paycheck, how much was she paid?
   - **F** $15.00
   - **G** $23.25
   - **H** $55.00
   - **J** $123.75

35. A $145 scooter is on sale at 20% off. Find the sale price.
   - **A** $29
   - **B** $116
   - **C** $120
   - **D** $125

36. How much simple interest will Sean earn on an investment of $200 if he invests it for 3 years at 8% interest?
   - **F** $16
   - **G** $24
   - **H** $32
   - **J** $48
37. Identify the quadrant of point C.

A Quadrant I
B Quadrant II
C Quadrant III
D Quadrant IV

39. Which function matches the function table?

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-3</td>
</tr>
<tr>
<td>1</td>
<td>-1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

A $3x - 1$
B $3x + 1$
C $2x - 3$
D $2x + 3$

40. Which of the following best describes the pattern for the table?

<table>
<thead>
<tr>
<th>x</th>
<th>2</th>
<th>4</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>-4</td>
<td>-8</td>
<td>-16</td>
</tr>
</tbody>
</table>

F arithmetic; add $-4$
G geometric; multiply by 3
H arithmetic; add $-3$
J geometric; multiply by 2
Answer Key

12. $15.04
13. 46
14. 52.77
15. 70
16. 6%
17. 275%
18. 55%
19. 7%
20. $24.48
21. $1,050
22. $3,700
23. 22.22 years
24. 21.01 years

Chapter 6 Free Response Test C

1. 63%
2. $12
25
3. 0.091
4. 585%
5. 16.3%
6. 62.5%
7. 7.2%
8. $90.92
9. about 50
10. about 210
11. 1.89
12. $11.18
13. 183.216
14. 128
15. 1,603.8
16. 7.21%
17. 150%
18. 16.7%
19. 25%
20. $23.20
21. $2,227.50
22. $10,933
23. 22 years
24. 4 years

Chapter 6 Performance Assessment

1. The greatest amount that can be spent is $225.
2. Possible answer: CD player: $81.04; race-car video game: 57.19; basketball: $22.48; total amount spent: $160.71
3. Possible answer: Money to be saved is 250 — $160.71 = 89.29; I will save it for 3 years.
4. Possible answer: interest = $89.29 \times 0.05 \times 3 = $13.39; total amount in savings after 3 years = 102.68

Chapter 6 Cumulative Test

1. C
2. G
3. B
4. G
5. C
6. G
7. C
8. J
9. C
10. G
11. B
12. F
13. B
14. J
15. B
16. J
17. D
18. F
19. A
20. G
21. C
22. J
23. C
24. G
25. C
26. J
27. C
For 1–2, use the following data: 3, 2, 5, 9, 10, 8, 6, 11, 2, 9, 7, 1.

1. What is the mode of the data?

2. How many stems would a stem-and-leaf plot of the data in the table have?

For 3–5, use the line plot.

3. What is the mode of the data?

4. What is the median of the data?

5. What is the mean of the data? Round to the nearest hundredth.

For 6–7, use the double-bar graph.

6. In which year were there more girls than boys?

7. How many total students were in band during the year of 2004?

8. Approximately what percent of the students surveyed chose soccer as their favorite sport?
For 9–10, use the box-and-whisker plots.

9. What is the difference between the medians for test A and test B?

10. What is the interquartile range of test B?

For 11–12, use the line graph.

11. During which year were lift ticket prices at their lowest?

12. In which five-year period did lift ticket prices increase most rapidly?

13. Which type of display would be the most appropriate to compare the sales of two different stores for a ten-year period?

14. Marion Middle School has 600 students. Mike surveys a random sample of 30 students and finds that 7 of them play a musical instrument. How many students at the school are likely to play a musical instrument?

15. What kind of correlation is shown by the data displayed in the scatter plot?

16. Why is the graph misleading?
For 1–2, use the figure below.

1. What type of figure is \( ZX \)?

2. What type of figure would be formed by connecting points \( X \) and \( Y \)?

For 3–5, use the figure below.

3. What type of angle is \( \angle CAD \)?

4. How do angles \( \angle CAD \) and \( \angle BAD \) relate to each other?

5. What is the measure of \( \angle BAC \)?

For 6–7, use the figure. \( \overline{AB} \) is parallel to \( \overline{CD} \).

6. What is the measure of \( \angle 4 \)?

7. What type of angle is formed by adding together \( \angle 3 \) and \( \angle 1 \)?

8. What part of the circle is \( \overline{GE} \)?

9. What type of polygon is the figure?
10. Which of the following best describes the triangle?

[Diagram of a triangle with sides 6 in., 10 in., and 8 in.]

11. Which of the following names the quadrilateral shown below?

[Diagram of a quadrilateral]

12. A quadrilateral has no equal sides and no equal angles. What type of quadrilateral is this?

13. A polygon has 6 sides. What is the sum of its interior angles?

14. A quadrilateral has angles that measure 60°, 75°, 120°, and \( x \)°. What is the value of \( x \)?

15. If the two triangles are congruent, what is the length of \( x \)?

[Diagram of two congruent triangles]

16. What is the measure of angle \( x \)?

[Diagram of two triangles with angles 90°, 15°, 12°, and \( x \)°]

17. Which type of transformation is shown?

[Diagram of a figure on a grid showing a transformation]

18. How many lines of symmetry does the figure have?

[Diagram of a hexagon]

Figure 2
1. Which is the most precise measurement: centimeters, inches, feet, or miles?

2. Which is the most precise measurement: yards, meters, kilometers, or feet?

3. Write a measurement in yards that has four significant digits.

4. Greg is drawing the outside lines on a sports field that is 76 feet by 94 feet. What is the total length of the line he will draw to surround the field?

5. What is the circumference of a circle with a radius of 7 centimeters? Use 3.14 for \( \pi \).

6. The diameter of Ben's bicycle wheel is 15 inches. What is the circumference to the nearest inch? Use 3.14 for \( \pi \).

7. Nathan has a rectangular rug that is 5 feet long and 4 feet wide. What is the area of the rug?

8. What is the area of a parallelogram with a base of 15 cm and a height of 6 cm?

9. What is the area of a rectangle with a length of 9 inches and a width of 10 inches?

10. The legs of a right triangle are 9 feet and 4 feet long. What is the area of the triangle?

11. A trapezoid has bases that measure 8 centimeters and 10 centimeters and a height that measures 8 centimeters. What is the area?

12. A circle has a diameter that measures 8 inches. What is the area of the circle to the nearest tenth?

13. A circle has a radius that measures 3 centimeters. What is the area of the circle to the nearest tenth?

14. An irregular figure is formed by a square and an isosceles right triangle. If the sides of the square and the legs of the triangle are 3 centimeters long what is the area of the figure?
15. What is the best estimate for the area of the figure?

16. A square garden has a total area of 121 square feet. What is the length of the garden’s sides?

17. A square garden needs to be at least 160 square feet in area, constructed from pieces of fencing 1 foot long. What is the smallest length of a side if it must be a whole number of feet?

18. The area of a square side table is 280 square inches. What is the approximate length of each side of the table? Round the answer to the nearest whole inch.

19. A 15-foot ladder is leaning against a wall. If the ladder is 9 feet from the base of the wall, how far above the ground does the ladder touch the wall?

20. The front flap of a tent is shaped like an isosceles triangle. The base of the triangle is 12 feet and the height of the triangle is 8 feet. What is the length of the congruent sides of the isosceles triangle?
1. Name a figure that has six rectangular bases.

2. Name a figure that could NOT have any rectangular faces.

3. What shape are the bases of the figure?

4. What shape is the base of the figure?

5. How many cubes does the prism hold?

6. What is the volume of the cylinder? Use 3.14 for \( \pi \) and round to the nearest tenth.

7. A storage trunk is 28 inches wide by 18 inches deep by 22 inches high. What is the volume of the trunk?

8. What is the volume of the pyramid?
Free Response

Test A, continued

CHAPTER 10

9. What is the volume of the cone? Use 3.14 for \( \pi \) and round to the nearest tenth.

[Diagram of a cone]

10. What is the volume of a 10-inch tall right triangular pyramid with a base hypotenuse of 5 inches and a base leg of 4 inches?

11. What is the surface area of the prism formed by the net shown?

[Diagram of a net for a prism]

12. What is the surface area of the cylinder formed by the net shown? Use 3.14 for \( \pi \).

[Diagram of a net for a cylinder]

13. A cylindrical soup can has a base radius of 3 inches and a height of 6 inches. If the can’s label covers the sides completely, but not the bases, what is the surface area of the label? Use 3.14 for \( \pi \).

14. The surface area of a triangular pyramid is 36 square inches. What is the surface area of a larger similar pyramid that has a scale factor of 3?

15. The volume of a cone is 4 cubic centimeters. The volume of a similar larger cone is 256 cubic centimeters. What is the scale factor?

16. The surface area of a rectangular prism is 324 square feet. A similar smaller rectangular prism has a scale factor of \( \frac{1}{6} \). What is the surface area of the smaller prism?

17. The volume of a cube is 81 cubic millimeters. The volume of a similar larger cube is 10,125 cubic millimeters. What is the scale factor?