NOTE TO TEACHERS: • *Calculators may be used for questions unless indicated otherwise.* • *Two formula sheets are provided on the last two pages for grades 6, 7, 8, 11 and the Grad.* • *The learning standard addressed in each question is included after the answer.* • *In most cases, for answers requiring a constructed response, several suggested solutions are included. There may be (probably are) other solutions possible.*

N E
Newspapers In Education

SEVENTH GRADE MATH

1. Devon answered 4/5 of the questions on his science test correctly. What percent of the questions did he answer correctly?

   A. 4.5%
   B. 45%
   C. 75%
   D. 80%

2. Kao rode her bicycle 84 miles in 6 hours. What was her average rate in miles per hour?

   A. 10 miles/hour
   B. 12 miles/hour
   C. 14 miles/hour
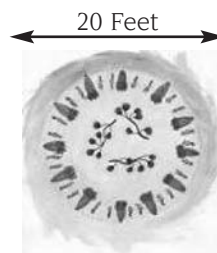   D. 16 miles/hour

3. What is the value of $5 + 7(9 - 3) \div 2 + 3^2$?
   (no calculator)

   A. 24
   B. 35
   C. 42
   D. 45

4. If someone lives to be 85 years old, the number of times their heart beats is estimated to be 2,680,000,000. How can this number be written in scientific notation? (no calculator)

   A. 2.68×10^9
   B. 26.8×10^8
   C. 268×10^8
   D. 268×10^{11}

Use the figure below for problem 5.

20 Feet

5. A circular garden has a diameter of 20 feet. What is the circumference of the garden rounded to the nearest foot? (Use 3.14 for π.)

   A. 314 feet
   B. 63 feet
   C. 126 feet
   D. 1,256 feet

6. Anthony saved $12 that was given to him as a gift. He continues to save $5 each week. Which expression below represents his total savings after *w* weeks?

   A. $5w$
   B. $12 \div 5w$
   C. $12 + 5w$
   D. $12 \times 5w$

7. Juanita drove from Rochester to Duluth. The scale on the map shows that 1 inch equals 12 miles. If the distance between the two cities is 19 inches on the map, how many miles will Juanita travel?
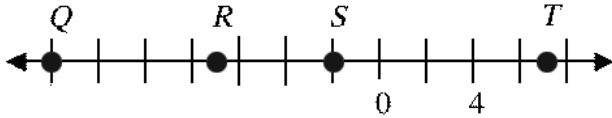
   A. 228 miles
   B. 114 miles
   C. 456 miles
   D. 912 miles

8. Marty has 5 red, 2 purple, 6 orange, 1 green, and 7 black marbles in a bag. He reaches into the bag without looking and pulls out a marble. What is the probability that he will pull out a red marble? Round your answer to the nearest hundredth.

   A. 0.24
   B. 0.25
   C. 0.29
   D. 0.33

1

Use the number line below to answer problem 9.

9. The temperature in St. Paul, Minnesota, on January 9th was -7° Fahrenheit. Which letter represents -7 on the number line?

A. Q
B. R
C. S
D. T

10. Last year, Kong's soccer team won 8 games. This year his team won 10 games. What is the percent increase in the number of games his team won?

A. 20%
B. 25%
C. 80%
D. 125%

11. Which expression below is equivalent to 3^4?
(no calculator)

A. 12
B. 27
C. 4 x 4 x 4
D. 3 x 3 x 3 x 3

Use the picture below to answer question 12.

12. The picture above shows the shape of Deidra's purse. What is the most specific name for this shape?

A. parallelogram
B. rectangle
C. trapezoid
D. rhombus

13. Adrian wants to divide 3/4 by 2/3. Which of the following is the first step he should perform to correctly divide the fractions?

A. find a common denominator
B. change the 2/3 to 3/2
C. add the numerators
D. find the difference of the denominators

14. 1/3 of the seventh graders at a school performed a science experiment on Tuesday morning. 2/5 of the seventh graders did the experiment that afternoon. What fraction represents the total number of seventh graders who performed the experiment on Tuesday?
(no calculator)

A. 11/15
B. 2/15
C. 3/15
D. 3/8

15. Greg went grocery shopping with his family. They bought 1 1/2 pounds of fish that cost $5.39 per pound. How much will they spend rounded to the nearest cent?
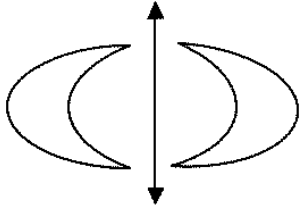Put your answer in the grid below.
(no calculator)

16. The area of a square picture frame is 49 square inches. What is the perimeter of the picture frame?

A. 3 1/2 inches
B. 7 inches
C. 12.25 inches
D. 28 inches

SEVENTH GRADE MATH

Use the picture below to answer question 17.

17. Which transformation is shown in the picture here?

   A. reflection
   B. rotation
   C. translation
   D. change of scale

18. During his basketball season, Karim scored the following point totals:
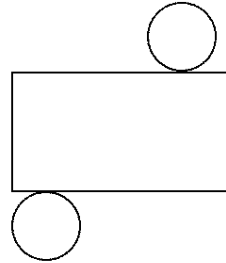**10, 17, 8, 15, 20, 2, 10, 9, 25, 15, 21, 15**
Part A: Calculate the range, median, mean and mode of the data set above.

Show or explain how you find each answer.

    Part B: In Karim's next game he scored 12 points. Does this change his median for the season?

Explain why or why not.

Use the picture below to answer question 19.

19. Margaret has drawn out the shape above on paper. What three-dimensional shape can be created using this pattern?

   A. pyramid
   B. cone
   C. rectangular prism
   D. cylinder

20. Jaylene can type 80 words per minute. She has to type a 3,600 word essay. How many minutes will it take her to type the essay if she doesn't take any breaks?
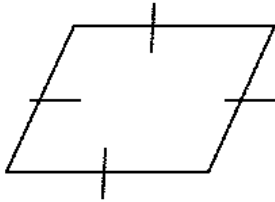
   A.   45 minutes
   B.   50 minutes
   C.   80 minutes
   D.   450 minutes

21. The circumference of a pizza is 47.1 inches. What is the area of the pizza rounded to the nearest tenth? (Use 3.14 for π.)

   A.   24.3 inches^2
   B.   56.3 inches^2
   C.   176.6 inches^2
   D.   706.5 inches^2

SEVENTH GRADE MATH
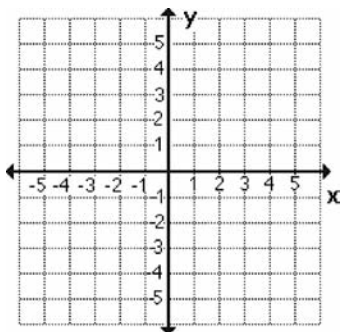
Use the picture below to answer problem 22.

22. A picture of the shape of Hua's table top is shown above. Which one of the following words cannot be used to describe this shape?

- A. quadrilateral
- B. rhombus
- C. parallelogram
- D. square

23. The formula for calculating the area of a triangle is area = 1/2 x base x height. If a triangle with an area of 40 square centimeters has a base length of 8 cm, then what is its height?
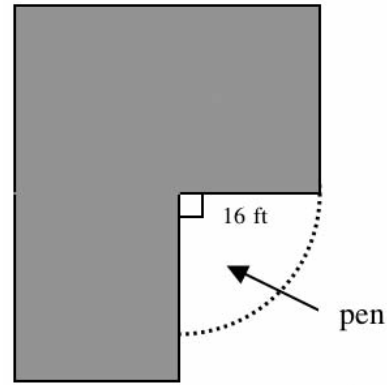
- A. 2.5 cm
- B. 5 cm
- C. 10 cm
- D. 20 cm

24. The coordinates of two points on a graph are (-1, 1) and (4, 3). What is the slope of the line that goes through these two points? Use the coordinate grid below to help you find the answer.

- A. 1/5
- B. 1/4
- C. 2/5
- D. 5

Use the picture below for problem 25.

25. Molly keeps her dog in the pen shown above. The pen is made by two walls of a building and a curved fence. What is the approximate area of the pen? (Use 3.14 for π)

- A. 25 feet^2
- B. 64 feet^2
- C. 100 feet^2
- D. 201 feet^2

26. Robert knows that the probability of rolling a "4" on one roll of a six-sided number cube is 1/6. If he rolls the cube 30 times, which of the following best predicts the number of times a "4" will be rolled?

- A. 4
- B. 5
- C. 8
- D. 10

27. Tong's math teacher said that it was the 99th day of the school year. Tong has math every day and has not been absent. If each class period is 55 minutes long, how many seconds has Tong been in math class this school year?

- A. 5,445 seconds
- B. 5,940 seconds
- C. 326,700 seconds
- D. 544,500 seconds

SEVENTH GRADE MATH

28. Freddie made a large drawing of the human eye. The ratio of the eye in his drawing and a real eye is 8:1. If the height of the eye in Freddie's drawing is 20 cm, what is the height of a real human eye?

   A.   0.4 cm
   B.   1.2 cm
   C.   1.6 cm
   D.   2.5 cm

29. Libby earned $350 shoveling snow.

Part A: Libby spent 1/4 of her money on music down loads. She spent 40% of the money on clothes, and gave 10% to a charity. Use a fraction, decimal or percent to describe the remaining portion of Libby's money.

Put your answer in the grid below.

Part B: Use your answer from Part A to calculate the dollar amount equivalent to the remaining portion of Libby's money. Show or explain your work.

Use the graph below for question 30.

Piano Recital Mistakes
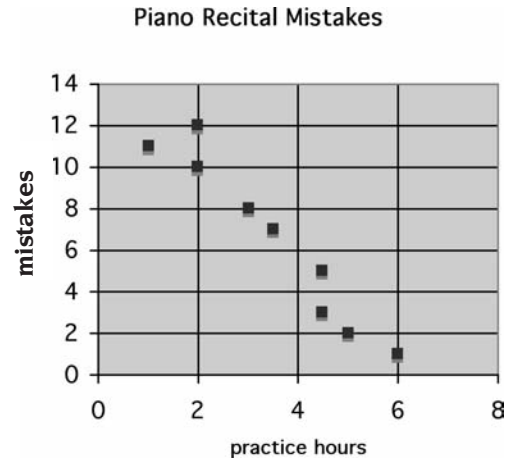
30. The graph above shows the number of practice hours and number of mistakes made by each performer at a piano recital. Based on the data, which of the following best predicts the number of mistakes made by a performer who practiced 4 hours?

   A.   1
   B.   2
   C.   6
   D.   9

SEVENTH GRADE MATH ANSWERS

1. D (number sense – represent rational numbers as fractions, mixed numbers, decimals or percents)
2. C (patterns, functions and algebra – demonstrate an understanding that rate is a measure of change of one quantity per unit in change of another quantity in real-world and mathematical problems)
3. B (patterns functions and algebra - apply the correct order of operations and grouping to simplify numeric and algebraic expressions)
4. A (number sense – use scientific notation to solve real world and mathematical problems)
5. B (spatial sense, geometry and measurement – calculate the radius, diameter, circumference and area of a circle)
6. C (patterns, functions and algebra – apply the correct order of operations and grouping symbols to generate algebraic expressions)
7. A (spatial sense, geometry and measurement – use ratios and proportions to interpret map scales and scale drawings)
8. A (data analysis, statistics and probability – express probabilities as percentages, fractions, and decimals)
9. B (number sense – locate and compare positive and negative rational numbers on a number line)
10. B (number sense – calculate the percentage of increase in a real-world or mathematical problem)
11. D (number sense – express powers as repeated multiplication)
12. C (spatial sense, geometry, and measurement – classify quadrilaterals as squares, rectangles, rhombi, parallelograms, trapezoids or none of these)
13. B (number sense/computation – divide rational numbers)
14. A (number sense/computation – add rational numbers)
15. $8.09 (number sense/computation – add, subtract, multiply and divide rational numbers)
16. D (number sense/computation – apply the relationship of squares and square roots as inverse operations)
17. A (spatial sense, geometry and measurement – use visual representations to solve real-world and mathematical problems)
18. **Part A:** Mean = 167 ÷ 12 ≈ 13.9. The 167 is the sum of all the data values and the 12 is the number of values in the data set.
The median can be found by ordering the data as follows: 2,8,9,10,10,15,15,15,17,20,21,25. Because there is an even number of data values there is no one number in the middle so the median becomes the average of the two middle numbers which are both 15. Thus, the median is (15 + 15) ÷ 2 = 15. The mode is the data value that occurs most often, which is also 15. The range is the difference of the highest and lowest values, which is 25 – 2 = 23.

Part B: Adding a 12 to the set of data values gives us the following ordered data set: 2,8,9,10,10,12,15,15,15,17,20,21,25. Now, with an odd number (13) of data values, there is one number exactly in the middle, which is again 15. Because of the three 15's in the data, adding the 12 to the list just shifted one of the 15's to the middle position in the list. So, the median did not change. (data analysis, statistics, and probability – understand the meaning of and be able to compute minimum, maximum, range, median, mean and mode of a data set)
19. D (spatial sense, geometry, and measurement – recognize a view of a three-dimensional shape)
20. A (patterns, functions and algebra – demonstrate an understanding that rate is a measure of change of one quantity per unit in change of another quantity in real-world and mathematical problems)
21. C (spatial sense, geometry and measurement – calculate the radius, diameter, circumference and area of a circle)
22. D (spatial sense, geometry and measurement – classify quadrilaterals as squares, rectangles, rhombi, parallelograms, trapezoids or none of these)
23. C (patterns, functions and algebra – solve simple formulas in real-world and mathematical problems)
24. C (patterns, functions and algebra – plot points on the graph of a linear function and identify the slope and rate of change)
25. D (spatial sense, geometry and measurement – calculate the area and perimeter of a sector of a circle)
26. B (data analysis, statistics, and probability – use a variety of experiments to explore the relationship between experimental and theoretical probabilities)
27. C (spatial sense, geometry and measurement – make calculations involving time, length, area and volume choosing appropriate units to calculate, measure, and record)
28. D (spatial sense, geometry and measurement – use ratios and proportions to interpret map scales and scale drawings)
29. **Part A:** 1/4 or .25 or 25%
Part B: Multiply Libby's dollar amount of $350 by 1/4 or .25 to get her remaining portion of money. (.25)(350) = $87.50 (number sense – convert among fractions, decimals and percents and use these representations for estimation and computation to solve real-world and mathematical problems)
30. C (data analysis, statistics, and probability – analyze simple scatter plots)