

1. A rock group gets 30% of the money from sales of their newest compact disc. That 30% is split equally among the 5 group members. If the disc generates \$1,000,000 in sales, how much does one group member receive?
 - a. \$30,000
 - b. \$50,000
 - c. \$60,000
 - d. \$200,000
 - e. \$300,000

2. A rectangle has these dimensions: 15.70 meters by 4.08 meters. One dimension of the rectangle is changed so that the area is doubled. Which of the following measurements could be the perimeter of the larger rectangular region?
 - a. 47.72 m
 - b. 125.6 m
 - c. 32.02 m
 - d. 64.04 m
 - e. 23.86 m

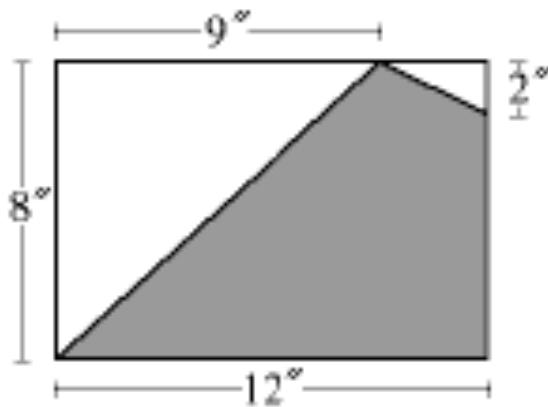
3. One liter is the capacity of one cubic decimeter. Which of the following could be dimensions of a container that holds 4 liters?
 - a. 2 dm x 2 dm x 0.5 dm
 - b. 4 dm x 4 dm x 4 dm
 - c. 1 dm x 0.5 dm x 2.5 dm
 - d. 4 dm x 0.5 dm x 0.5 dm
 - e. 4 dm x 1.6 dm x 0.625 dm

4. Secretariat won the 1973 Belmont Stakes in a record time of 2 minutes and 24 seconds. The Belmont Stakes is $1\frac{1}{2}$ miles long. Find Secretariat's average speed in the Belmont in **feet per second**.
 - a. 36.7 feet per second
 - b. 54.2 feet per second
 - c. 55 feet per second
 - d. 62.9 feet per second
 - e. 67 feet per second

5. A colony of bacteria doubles its population every 8 hours. There are 2000 bacteria in the colony at noon on Monday. How many bacteria would there be at noon on Monday, one week later?

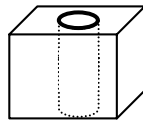
- a. 4,194,304,000
- b. 294,000
- c. 7.48289×10^{53}
- d. 2.0971×10^{69}
- e. 84,000

6. Lengths are shown in inches on the drawing of the rectangle below. What percentage of the area is shaded?



- a. 57%
 - b. 25%
 - c. 59.375%
 - d. 81.25%
 - e. 50%
7. In a contest, a prize of 2.72 million dollars was split equally among 32 winners. How much money did each of the 32 winners receive?
- a. \$0.085
 - b. \$62,500
 - c. \$62,502.25
 - d. \$85,000
 - e. \$850,000

8. The weight of an object, rounded to the nearest hundred, is 1,700 pounds. Of the following, which could be the actual weight of the object?
- a. 1,640 pounds
 - b. 1,645 pounds
 - c. 1,649 pounds
 - d. 1,749 pounds
 - e. 1,751 pounds
9. This figure shows a solid cube (with edge length of 3 inches). A cylindrical hole has been drilled completely through the cube. The cylindrical hole has diameter 1 inch. The cube is then dipped into paint to cover all the exposed surfaces. How many square inches did the paint cover? Round to the nearest tenth of a square inch.



- a. 52.4 square inches
 - b. 54 square inches
 - c. 61.9 square inches
 - d. 63.4 square inches
 - e. 65 square inches
10. In a chess tournament, $\frac{3}{7}$ of the women are matched against half of the men. What fraction of all the players is matched against someone of the other gender?
- a. $\frac{2}{5}$
 - b. $\frac{3}{7}$
 - c. $\frac{4}{9}$
 - d. $\frac{6}{13}$
 - e. $\frac{13}{28}$

11. In mathematics the exclamation point has a special meaning. Here are two examples:

$$5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$$

$$8! = 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 40,320$$

Calculate the value of $20! \div 18!$.

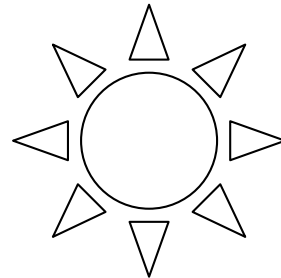
- a. 4.8×10^{31}
 - b. 4.8^{31}
 - c. 1.6×10^{34}
 - d. 1.6^{34}
 - e. 380
12. Jim has 20 meters of string. From it, he cuts as many pieces as possible that are 12.5 decimeters long. How many pieces will he have?
- a. 1 piece that is 12.5 dm long and 1 piece that is 0.6 dm long
 - b. 16 pieces that are 12.5 dm long
 - c. 160 pieces that are 12.5 dm long
 - d. 25 pieces that are 12.5 dm long
 - e. 250 pieces that are 12.5 dm long
13. Erin wants to determine the height of a tree. When the length of the tree's shadow is 42 feet, a yard stick casts a 5 foot long shadow. What is the height of the tree?
- a. 22.3 feet
 - b. 25.2 feet
 - c. 31.5 feet
 - d. 34.1 feet
 - e. 40 feet
14. How many edges does a pentagonal pyramid have?
- a. 5
 - b. 10
 - c. 15
 - d. 20
 - e. 25

15. There are n students in a class. Among those students, $p\%$ play at least 1 musical instrument. Which expression represents the number of students who play NO musical instrument?

- a. np
- b. $0.01np$
- c. $\frac{(100 - p)n}{100}$
- d. $\frac{(1 - p)n}{0.01}$
- e. $100 \cdot (1 - p) \cdot n$

16. Find the number of lines of symmetry for this figure.

- a. 16
- b. 12
- c. 8
- d. 7
- e. 4



17. What is the least 5-digit number that is the sum of 3 consecutive counting numbers?

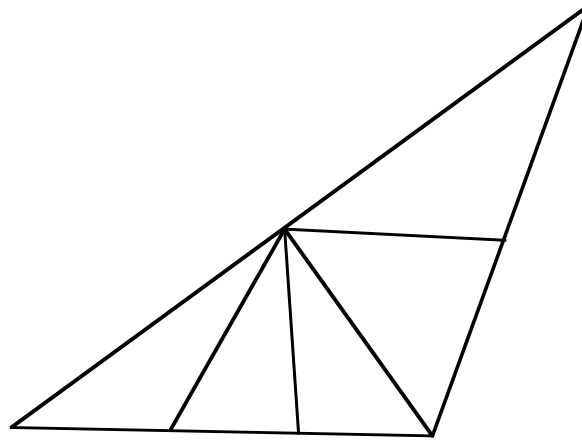
- a. 10,002
- b. 10,003
- c. 10,030
- d. 10,005
- e. 10,001

18. When I entered 0.2^{10} into my calculator, the calculator display looked like this: 1.024 E -7. What does 1.024 E -7 mean?

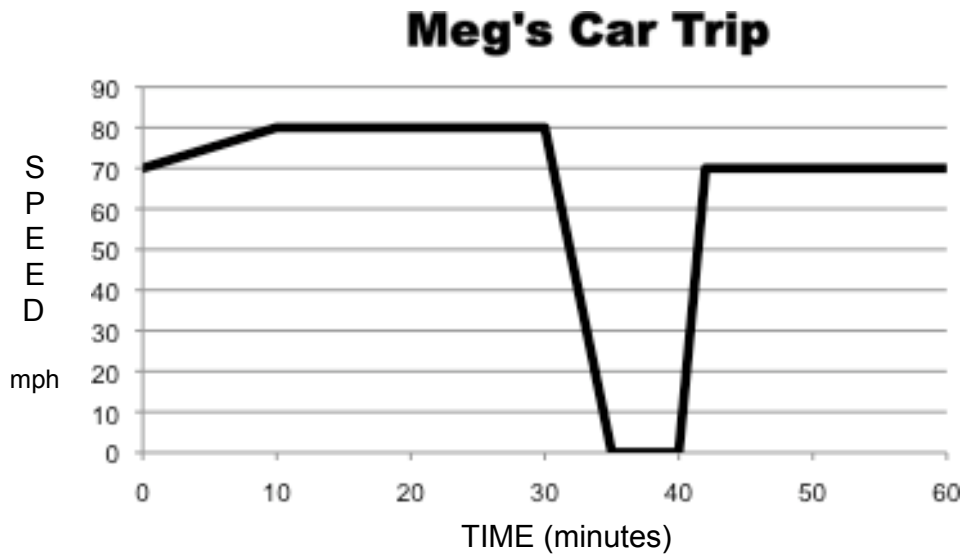
- a. $0.2^{10} = 1.024^{-7}$
- b. $0.2^{10} = 1.024 \times 10^{-7}$
- c. The E indicates that there is an error.
- d. $0.2^{10} = 0.0001024$
- e. $0.2^{10} = 0.00000001024$

19. How many triangles of any size are in the figure shown here.

- a. 6
- b. 8
- c. 9
- d. 10
- e. 12



20. The graph below shows Meg’s speed over time as she traveled along the interstate between Clarksville and Paducah. Which statement about Meg’s trip is TRUE?



- a. Meg drove up a slight incline during the first five minutes of this trip.
- b. Between the 10th and 30th minutes Meg was stopped at the top of a hill.
- c. Meg’s car was stopped at the 38th minute shown on the graph.
- d. Meg was going 40 miles per hour for 5 minutes.
- e. Meg traveled the same distance between the 50th and 60th minutes as she did between the 15th and 25th minutes.

21. Suppose that m is a positive number greater than 1. Suppose that p is a positive number whose value is less than 1. Which of the following statements is false?

- a. $mp < \frac{m}{p}$
- b. $m + p > m - p$
- c. $p^m > p$
- d. $m^p < m$
- e. $mp < m + p$

22. Suppose that $a + b = c$ and $b + c = d$. Which of the following equations is TRUE?

- a. $d - b = a + b$
- b. $c = d - a$
- c. $a = d - b$
- d. $d + b = 2a + 2b$
- e. $d - c = 2a$

23. Jack bought three notebooks and four markers for \$25.41. Jill bought two notebooks and six markers for \$21.24. Jon needs to buy one notebook and two markers. How much money does he need? (Assume that all notebooks are the same price. Assume all markers are the same price. Assume there is no sales tax.)

- a. \$9.33
- b. \$7.42
- c. \$8.34
- d. \$12.51
- e. \$10.89

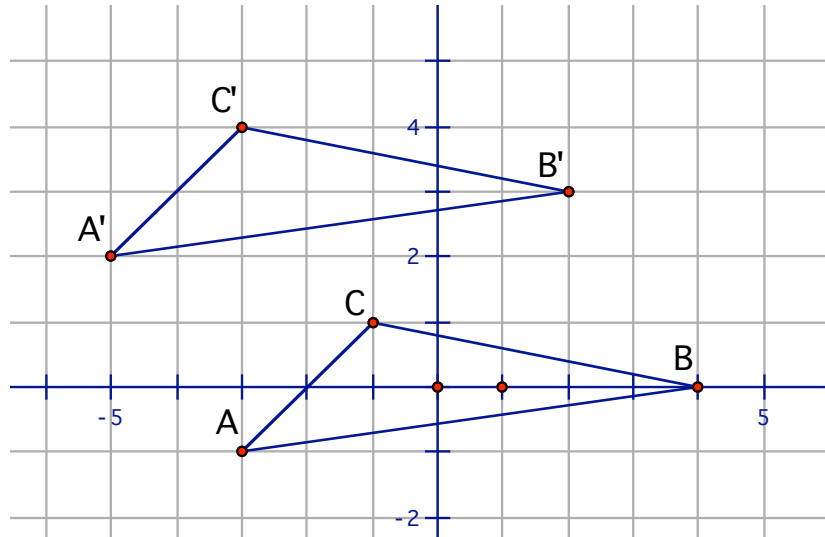
24. One ounce of baked potato chips has 20% of the amount of fat in one ounce of “classic” potato chips. How many ounces of baked potato chips would you have to eat to get the same amount of fat as in two ounces of “classic” chips?

- a. 20 ounces
- b. 8 ounces
- c. 80 ounces
- d. 5 ounces
- e. 10 ounces

25. Tina bought 72 1-foot sections of border to go around two flower beds. Each flower bed is a square region. The length of each side of the front yard flower bed is 4 feet longer than the length of each side of the back yard flower bed. What is the perimeter of the back yard flower bed?
- 36 feet
 - 20 feet
 - 32 feet
 - 28 feet
 - 44 feet
26. The least common multiple of a mystery number and 45 is 135. How many different positive numbers could the mystery number be?
- 1
 - 2
 - 3
 - 4
 - infinitely many
27. Each year a particular car is worth 5% less than it was the year before. The car has an original value of \$22,400. Which of the following calculations would determine the car's value after three years?
- $22,400 \times 0.15$
 - $22,400 \times 0.95 \times 3$
 - $22,400 \times 0.85$
 - $22,400 \div 0.95^3$
 - $22,400 \times 0.95^3$
28. Two hundred eighty pennies are arranged in a rectangular array. Every row has the same number of pennies. One row can be eliminated by putting 5 more pennies into each of the remaining rows. How many rows were in the original array?
- 5
 - 6
 - 7
 - 8
 - 10

29. Triangle ABC and its image, triangle $A'B'C'$, are shown on a Cartesian graph. The image was produced by a translation (slide) of the original triangle. Point P with coordinates (a, b) is a point on triangle ABC. Which of the following are the coordinates of the image of point P?

- a. $(a + 2, b - 3)$
- b. $(a - 2, b + 3)$
- c. $(a + 3, b - 2)$
- d. $(3 - a, b + 2)$
- e. $(a - 3, b + 2)$



30. Which of the following equations illustrates an application of the associative property?

- a. $5 \cdot (6 + 1) = 5 \cdot 6 + 5 \cdot 1$
- b. $5(6 \cdot 9) = (5 \cdot 6)(5 \cdot 9)$
- c. $5 \cdot 6 = 6 \cdot 5$
- d. $5 \cdot (6 \cdot 9) = (5 \cdot 6) \cdot 9$
- e. $5 \cdot (6 \div 9) = (5 \cdot 6) \div (5 \cdot 9)$