

2015 SCSU MATH CONTEST

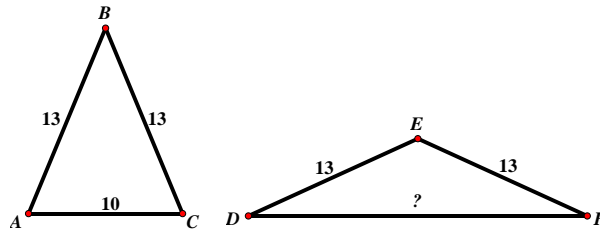
7th and 8th Grade Test

DIRECTIONS: Select the BEST completion or response from among those given. Scientific and graphing calculators are allowed. Symbolic calculators are not allowed.

- Let M be the sum of seven 7s. Let N be the sum of seven Ms. What is N?
A. 14 B. 28 C. 49 D. 56 E. 343
- If a number is added to one more than that number, and then one less than the original number is subtracted from the sum, the result is 21. What is the original number?
A. 14 B. 16 C. 18 D. 19 E. 21
- The number 2015 can be uniquely factored into a product of three prime numbers. What is the sum of these prime numbers?
A. 47 B. 49 C. 51 D. 53 E. 55
- If I divide my age by 5, the remainder is 3. Your age is twice mine. If I divide your age by 5, what will the remainder be?
A. 0 B. 1 C. 2 D. 3 E. 4
- Suppose you are collecting aluminum cans and that each can weighs 0.25 ounces. If one pound of aluminum cans is worth \$0.50, how many cans must you collect to have \$100 worth? (1 pound = 16 ounces)
A. 800 B. 1,600 C. 3,200 D. 6,400 E. 12,800
- A spinner is divided into three sectors. One-third of the spinner is red, 40 percent is blue, and the remainder is green. Find the probability that the arrow will land in the green sector on a single spin.
A. $\frac{4}{15}$ B. $\frac{1}{3}$ C. $\frac{3}{8}$ D. $\frac{7}{15}$ E. $\frac{5}{8}$
- Tom drives at a constant speed of 60 mph for 6 hours and then at a constant speed of 40 mph for 4 hours. Find his average speed (in mph) for the 10 hours.
A. 50 B. 51 C. 52 D. 53 E. 54
- A rectangular field has a length $\frac{3}{4}$ of a mile and a width of 660 yards. The area of the field is what fractional part of a square mile? (1 mile = 5280 feet)
A. $\frac{1}{4}$ B. $\frac{9}{32}$ C. $\frac{3}{8}$ D. $\frac{7}{4}$ E. $\frac{15}{8}$
- During the drive to the Math Contest, Jill asked her teacher, "Are we there yet?" The teacher said, "No, but we are halfway there." Just 12 miles later, at 8:15 a.m., Jill again asked, "Are we there yet?" The teacher responded, "Not yet, but we are now $\frac{5}{8}$ of the way there." At 8:15 a.m., how many miles were they from the Math Contest?
A. 24 B. 30 C. 36 D. 60 E. 96
- $\frac{1}{3}$ of 9^{120} is 3^N . The value of N is
A. 80 B. 121 C. 239 D. 252 E. 359

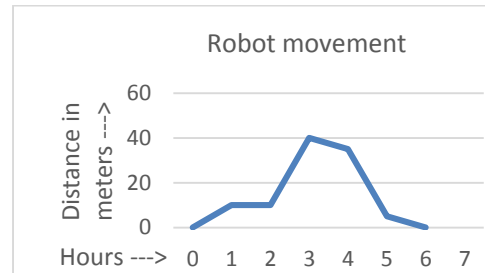
11. If $x \# y = x^2 - y^2$ and $x @ y = x + y$, find the value of $5 \# (4 @ (3 \# (2 @ 1)))$.
- A. 0 B. 3 C. 9 D. 19 E. 135
12. All nine digits of three 3-digit numbers are different. What is the largest possible sum of three such numbers?
- A. 1368 B. 1962 C. 2556 D. 2961 E. 4328

13. The base of isosceles triangle ABC measures 10 units. The two triangles have the same area. What is the measure of the base of triangle DEF?



- A. 12 B. 16 C. 20 D. 24 E. 26

14. This graph at the right describes the movement of a robot in the forward direction from its starting point. Consider the three statements below. Which are true?



- i) The robot moves towards the starting point between hours 4 and 5.
 ii) The robot turns around at hour 3.
 iii) The robot ends at a different location than it starts.

- A. i only B. ii only C. iii only D. i and ii only E. i, ii, and iii

15. Marissa gives $\frac{1}{5}$ of her cookies to Craig. She then gives $\frac{1}{2}$ of the remaining cookies to Pat and then gives $\frac{1}{4}$ of the cookies that remain to Zeke. If Marissa now has 12 cookies left, how many cookies did she have before giving any away?

- A. 38 B. 40 C. 46 D. 52 E. 62

16. A box has five pieces of candy, among which two are strawberry flavored and three are lemon flavored. If you randomly draw two pieces of candy out of the box, one by one without replacement, what is the probability that they both have the same flavor?

- A. $\frac{1}{5}$ B. $\frac{2}{5}$ C. $\frac{3}{5}$ D. $\frac{2}{3}$ E. $\frac{4}{5}$

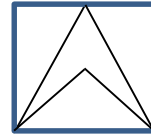
17. Six students in a small class took an exam. The average of their grades was 75. The seventh student was absent and took the exam another day. When this student's score was included, the class average rose to 78. What was the seventh student's score?

- A. 81 B. 84 C. 87 D. 90 E. 96

18. Suppose you have buckets of three different sizes: small buckets hold 5 quarts, medium buckets hold 7 quarts, and large buckets hold 11 quarts. All of the buckets are full of water. There are a total of 14 buckets. The number of medium buckets is twice the number of small buckets and the number of large buckets is twice the number of medium buckets. How many quarts of water do you have?

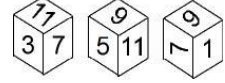
- A. 53 B. 63 C. 116 D. 126 E. 322

19. An arrowhead is formed in a 2×2 square by joining the bottom corners to the midpoint of the top edge and the center of the square. Find the area of the arrowhead.



- A. 1 B. 1.5 C. 2 D. 2.5 E. 3

20. Three different views of the same cube labeled with the first six positive odd integers are shown below. What number is on the face opposite of 5?

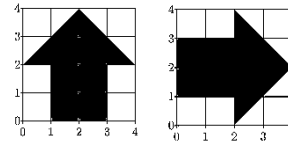


- A. 1 B. 3 C. 7 D. 9 E. 11

21. What is the greatest prime factor of $9^{18} - 3^{32}$?

- A. 3 B. 5 C. 11 D. 17 E. 19

22. An up arrow (as shown), a right arrow (as shown), a down arrow (not shown), and a left arrow (not shown) are all superimposed on the same grid. All arrows are the same size. How many square units do they shade as a result?



- A. 8 B. 9 C. 10 D. 12 E. 14

23. What is 60 percent of the sum of the first twenty counting numbers?

- A. 114 B. 120 C. 123 D. 126 E. 252

24. Based on the pattern, what is the 2015th symbol in the pattern shown below?

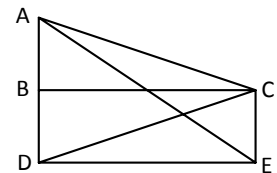


- A. B. C. D. E.

25. Mary, Laura, and Carol are participating in a gymnastics meet. The average of Mary's and Laura's scores is 8.4. The average of Laura's and Carol's scores is 7.8. The average of Mary's and Carol's scores is 7.5. What is the average score of all three gymnasts?

- A. 7.9 B. 8.1 C. 11.35 D. 11.85 E. 23.7

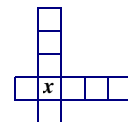
26. The diagram shown to the right is not drawn to scale. It is known that segments AD and DE have the same length, BCED is a rectangle, triangle ADE has area 32, and triangle DEC has area 18.



What is the area of triangle ABC?

- A. 14 B. 16 C. 18 D. 28 E. 36

27. The numbers 2, 3, 4, 5, 6, 7, 8, 9, and 10 are to be placed, one per square, in the diagram shown so that the five numbers in the vertical column add up to 31 and so that the five numbers in the horizontal column also add up to 31. What number should replace x ?



- A. 4 B. 5 C. 6 D. 7 E. 8

