Oklahoma School of Science and Mathematics

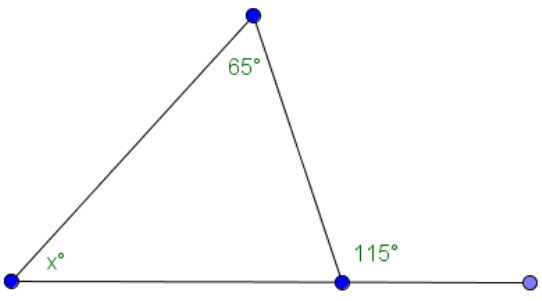
16th Annual Middle School Mathematics Contest

Round One, Spring 2018

Name:

Directions: Write the answer to each question in the box to the right of the question. Units are given in plural form even if the singular form is correct. Use scratch paper to do your work. Calculators are recommended, but not required. Common fractions should be in simplest form ($\frac{a}{b}$, not mixed numbers). Figures are not drawn to scale.

1. If the price of a model of car, x, has increased by 25%, what is the new value of the car? a. $0.25x$ b. $0.75x$ c. $1.25x$ d. $125x$	1. a. b. (c.) d.
2. If $(x-1)(x-3)=8$, then $(x-1)(3-x)=$? a. -64 b. -56 c. -8 d. 8 e. 64	2. a. b. (c.) d. e.
3. A certain line's x- and y-intercepts are n and $-n$, respectively. If the line does *not* pass through the origin, then its slope must be a. -1 b. 0 c. 1 d. undefined	3. a. b. (c.) d.
4. All sprackles are zaxes. Some morvids are sprackles. No blags are zaxes. Based on this information, which of the following situations is impossible? a. All sprackles are morvids. b. All blags are morvids. c. All zaxes are morvids. d. All morvids are zaxes. e. All morvids are blags.	4. a. b. c. d. (e.)
5. I'm thinking of a number that is a product of three consecutive integers. My number is which of the following? a. 45 b. 48 c. 56 d. 60	5. a. b. c. (d.)
6. Of the following, which number is greatest? a. $\frac{11}{1000}$ b. $\frac{111}{10{,}000}$ c. $\frac{101}{10{,}000}$ d. $\frac{1}{100}$ e. $\frac{55}{5000}$	6. a. (b.) c. d. e.
7. What is the average measure of the angles in any triangle? a. indeterminate b. $30°$ c. $45°$ d. $60°$ e. $90°$	7. a. b. c. (d.) e.
8. If the product of two integers is odd, their sum cannot be a. odd b. even c. 0 d. negative	8. (a.) b. c. d.
9. Which of these is a prime number? a. 91 b. 101 c. 111 d. 119 e. 129	9. a. (b.) c. d. e.
10. If a polygon is equilateral with a perimeter of 60, one side is longest when the figure is a a. triangle b. square c. pentagon d. hexagon	10. (a.) b. c. d.
11. If $\sqrt{x}+\sqrt{y}=8$ and $\sqrt{x}-\sqrt{y}=2$, then what is the value of x? a. 3 b. 5 c. 9 d. 25	11. a. b. c. (d.)
12. On a middle school field trip, there are exactly twice as many 8th graders as 7th graders, and exactly twice as many 7th graders as 6th graders. The total number of students on the field trip must be a multiple of a. 4 b. 5 c. 6 d. 7 e. 8	12. a. b. c. (d.) e
13. At Jahnavi's Ice Cream Parlor, you can choose from among 6 different flavors of ice cream. You can also choose to add any combination of sprinkles, fudge, or chocolate chips (or you could choose to add no toppings). Given these options, how many different ice cream dishes are possible? a. 18 b. 24 c. 36 d. 48 e. 60	13. a. b. c. (d.) e

14. Which of the following best approximates the circumference of a circle with radius 3? a. 3.14 b. 9.42 c. 18.85 d. 28.27	14. a. b. (c.) d.
15. $1 \div (2 \div 1) \div (1 \div 2) \div 2 =$ a. 0.175 b. 0.25 c. 0.5 d. 1 e. 2	15. a. b. (c.) d. e.
16. A certain rectangle has sides whose lengths are whole numbers. If its perimeter is 18, then which of the following is **not** a possible area of the rectangle? a. 8 b. 12 c. 14 d. 18 e. 20	16. a. (b.) c. d. e.
17. January 1, 2018 is a Monday. What day of the week is December 31, 2018? (Note: 2018 is not a leap year.)	17. Monday
18. If $y = \frac{6}{x-1}$, for what value of x does $y = 5$?	18. $\frac{11}{5}$ or 2.2
19. A helicopter charter company charges a flat fee of \$249, plus \$110 for each hour of flight. Reservations are only made in whole numbers of hours. What's the longest flight you can book with a budget of \$1000?	19. 6 hours
20. What is the value of 10 million divided by 100 thousand?	20. 100
21. Two tacos and one burrito costs \$11.00. Three tacos and two burritos costs \$19.50. How much does one taco and one burrito cost?	21. \$8.50
22. $10 - (9 - (8 - (7 - (6 - (5 - (4 - (3 - (2 - 1)\,)\,)\,)\,)\,)\,)\,)\,) =$	22. 5
23. What is the least common multiple of the first five positive even numbers?	23. 120
24. How many different perfect square numbers are there between 101 and 399?	24. 9
25. If $x = -\frac{1}{2}$ and $y = \frac{7}{8}$, then what is the value of $(-x) - y$ written as an improper fraction?	25. $-\frac{3}{8}$
26. If $\frac{0.000000000183}{183{,}000{,}000} = 10^x$, what is the value of x?	26. -18
27. The Hallett Motor Racing Circuit near Tulsa is 1.8 miles long. At an average of 72 miles per hour, how many seconds would it take a motorcycle to complete the circuit?	27. 90 seconds
28. If there are 31 homework assignments, and a perfect homework score for one assignment means you may skip the next three, what is the fewest homework assignments you would have to complete?	28. 8
29. Cullen's weekly salary is \$600, but based on impressive job performance he receives a 25% raise. He then receives another raise, this time of $x\%$, that brings his weekly salary to \$900. What is the value of x?	29. 20
30. In the triangle below, what is the value of x? 	30. 50