

# Orange County Math Circle New Year MATHCOUNTS Scrimmage

Team Round

Name: \_\_\_\_\_

School: \_\_\_\_\_

Grade: \_\_\_\_\_

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1. A car that originally sold for \$12,000 depreciates at a rate of 20% per year. What is the number of dollars in the value of the car at the end of 3 years?  
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2. A rectangular corral is to be build using 160 feet of fence. One side of the corral will be part of a straight 100-foot wall of an adjacent building. What is the maximum number of square feet possible for the area of the corral?  
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3. A rental company charges \$45 per day and 35 cents per mile to rent a car. What is the maximum whole number of miles that can be driven in one day and still keep the cost less than \$125?  
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4. What is the value of  $(11^{10})(11^5 + 11^2)^{-1}$ ? Express your answer as a decimal to the nearest tenth.  
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5. The first term of a geometric sequence is 7, and the 7th term is 5103. What is the 5th term?  
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6. In trapezoid  $ABCD$ ,  $\overline{AB} \parallel \overline{DC}$ ,  $AB = BC = 5$  cm,  $BD = 12$  cm, and  $\angle DBC$  is a right angle. What is the number of square centimeters in the area of  $\triangle ABD$ ? Express your answer as a decimal to the nearest tenth.  
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7. What is the remainder of  $19^{2010}$  divided by 25?  
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8. The volume of a cube is twice the volume of another smaller cube. If the edge length of the smaller cube is 1 inch, what is the number of inches in the edge length of the larger cube? Express your answer as a decimal to the nearest hundredth.  
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9. A six-sided die is weighted so that the probabilities of rolling a 1, 2, 3, or 4 are equal. The probabilities of rolling a 5 or 6 also are equal to each other. With this die, Kia is three times more likely to roll a 6 than a 2. What is the probability that she will roll a 4? Express your answer as a common fraction.  
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10. A Martian day, called a sol, is 24 hours, 39 minutes long in Earth time. If it is noon at a particular location on Earth and noon at the same moment at a particular location on Mars, after how many sols will it first be noon at these same locations at the same moment in time again?  
\_\_\_\_\_ (sols)