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# MATHCOUNTS®

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2019  
■ School Competition ■  
Target Round  
Problems 1 & 2

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Name \_\_\_\_\_

**DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.**

This section of the competition consists of eight problems, which will be presented in pairs. Work on one pair of problems will be completed and answers will be collected before the next pair is distributed. The time limit for each pair of problems is six minutes. The first pair of problems is on the other side of this sheet. When told to do so, turn the page over and begin working. This round assumes the use of calculators, and calculations also may be done on scratch paper, but no other aids are allowed. All answers must be complete, legible and simplified to lowest terms. Record only final answers in the blanks in the left-hand column of the problem sheets. If you complete the problems before time is called, use the time remaining to check your answers.

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Problem 1	Problem 2	Scorer's Initials

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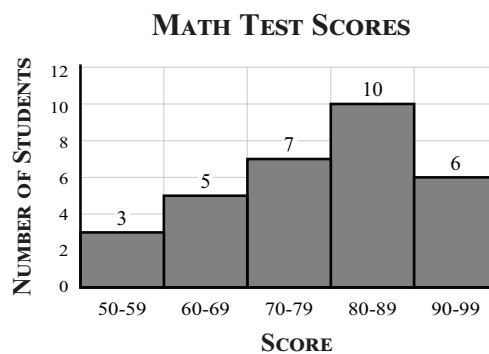
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- Art of Problem Solving
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1. \$ \_\_\_\_\_ A 32-ounce jar of a barbecue sauce costs \$8.00, while an 8-ounce jar of the same sauce costs \$4.00. How much less does Jennifer pay per ounce by purchasing the jar that costs less per ounce?

2. \_\_\_\_\_ Ms. Ramirez gave a test in her math class and created the histogram shown to display her students' scores. If no two students scored the same number of points on this test, what is the least possible value of the median score?



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# MATHCOUNTS®

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2019  
■ School Competition ■  
Target Round  
Problems 3 & 4

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Name \_\_\_\_\_

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Problem 3	Problem 4	Scorer's Initials

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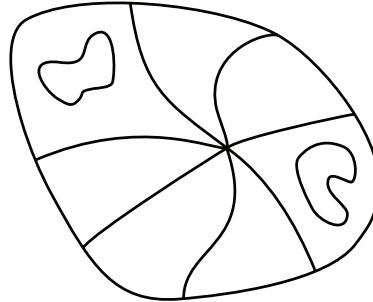
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3. \_\_\_\_\_ colors

The figure shows a map of nine countries. When the map is correctly colored, each country is a single color, and two countries that share a common border are different colors. Note that two countries that share only a common point are not considered to share a common border. Based on this, what is the minimum number of colors needed to correctly color this map?



4. \_\_\_\_\_

Teri designed a game to play against her brother Will in which Teri flips a fair coin  $n$  times, and Will wins if and only if exactly one of the flips lands heads up. If there is a 25% chance of Will winning the game, what is the value of  $n$ ?

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# MATHCOUNTS®

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2019  
■ School Competition ■  
Target Round  
Problems 5 & 6

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Name \_\_\_\_\_

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Problem 5	Problem 6	Scorer's Initials

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5.           fleconds    On planet Fleeg, time is measured in flinutes and fleconds. A flinute is equal to 2.5 earth minutes, and a flecond is equal to  $\frac{3}{4}$  of an earth second. How many fleconds are in a flinute?

6.           percent    Because weightlessness in outer space causes astronauts to lose bone mass, at the end of each month, an astronaut has two percent less bone mass than at the beginning of that month. If Lori has a 6-month mission on the International Space Station, what percentage of her bone mass will remain when she returns to Earth? Express your answer to the nearest tenth.

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# MATHCOUNTS®

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2019  
■ School Competition ■  
Target Round  
Problems 7 & 8

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Name \_\_\_\_\_

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Problem 7	Problem 8	Scorer's Initials

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7. \_\_\_\_\_ days On the first day of her new job, Julia is paid one cent. Each subsequent day, she is paid double what she was paid the previous day. How many days will Julia have to work for her total earnings to exceed \$1000?

8. \_\_\_\_\_ The two concentric circles shown have diameters  $a$  mm and  $b$  mm, where  $a$  and  $b$  are integers with  $a < b$ . The gray region between the two circles has area  $48\pi$  mm<sup>2</sup>. What is the sum of all possible values of  $b$ ?

