MATHCOUNTS®

2025 State Competition
Target Round Problems 1–8

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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.

1. _____ The sum of two numbers is 9876. The absolute difference between the numbers is 5432. What is the greater number?

2. _____ liters Elisa exercises every Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, taking a break only on Sundays. During each 50-minute workout, she drinks 0.25 liters of water every 10 minutes. Given that April has 30 days and April 1 is a Monday, how many liters of water will she drink while exercising throughout the month? Express your answer as a decimal to the nearest tenth.

3. _____ cheeses

Nigel's refrigerator is chock full of cheeses from all around Europe. Half the cheeses are from France, $\frac{1}{4}$ are from Italy, $\frac{1}{8}$ are from England, $\frac{1}{16}$ are from Greece and $\frac{1}{32}$ are from the Netherlands. The rest are from Switzerland. If Nigel has three cheeses from Switzerland, how many cheeses are in Nigel's collection?

4. _____ cm

Suppose a right triangle has an area of 20 cm^2 and a perimeter of 40 cm. What is the length of the hypotenuse, in centimeters?

5. _____ pies A recipe for strawberry pie calls for 4 cups of strawberries. If Madeline has 202 strawberries, and a single cup of strawberries contains 6 strawberries, how many whole pies can she make?

6. _____ Chandra writes down all of the nonempty subsets of {1, 2, 3, ..., 2025}, and for each subset she then erases everything except the largest element. What is the mean value of all of these largest elements? Express your answer to the nearest integer.

7. _____ cupcakes

Estrella baked a number of cupcakes that could be evenly divided into eight boxes. Then Orion ate one cupcake, leaving her with a number of cupcakes that could be evenly divided into nine boxes. Later, Orion ate another cupcake, leaving her with a number of cupcakes that could be evenly divided into ten boxes. What is the least possible number of cupcakes that Estrella could originally have baked?

8. _____ flips

Xing has an unfair coin with probability $\frac{2}{3}$ of getting heads. What is the expected number of flips he will need to get a head followed by two tails in three consecutive flips? Express your answer as a common fraction.