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# MATHCOUNTS®

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2020  
■ Chapter Competition ■  
Target Round  
Problems 1 & 2

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Name \_\_\_\_\_

School \_\_\_\_\_

**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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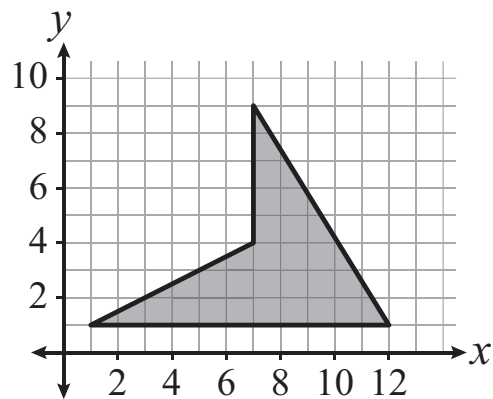
1. \_\_\_\_\_  
candy  
bars

Natasha received 14 candy bars at Halloween, while her younger brother Soren received 8. How many candy bars must Natasha give Soren to ensure that they both have the same number of candy bars?



2. \_\_\_\_\_  
units<sup>2</sup>

In the coordinate grid shown, what is the area of the shaded quadrilateral, all of whose vertices are on lattice points of the grid?



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2020  
■ Chapter Competition ■  
Target Round  
Problems 3 & 4

Name \_\_\_\_\_

School \_\_\_\_\_

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Problem 3	Problem 4	Scorer's Initials

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3. \_\_\_\_\_ If the polynomial  $5x - 3$  is a factor of the polynomial  $5x^2 + 7x + k$ , what is the value of the constant  $k$ ?

4. \$ \_\_\_\_\_ The movie sequel *Cat Lawyer II: The Purrfect Crime* grossed \$35.3 million during its opening weekend by selling 4.29 million tickets. Based on this, what was the average price per ticket during opening weekend for this movie?



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2020  
■ Chapter Competition ■  
Target Round  
Problems 5 & 6

Name \_\_\_\_\_

School \_\_\_\_\_

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Problem 5	Problem 6	Scorer's Initials

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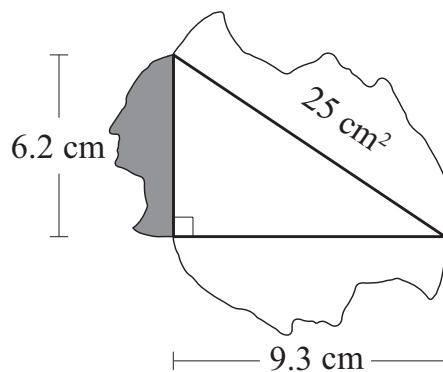
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5. \_\_\_\_\_ Addi, Subbi, Multi and Divi, are given two distinct nonzero numbers. Addi adds the two numbers. Subbi subtracts the lesser number from the greater. Multi multiplies the two numbers. Divi divides the greater number by the lesser. If the results obtained by Addi, Multi and Divi are the same, what is Subbi's result? Express your answer as a common fraction.

6. \_\_\_\_\_  $\text{cm}^2$  Three geometrically similar George Washington profiles are attached to the sides of a right triangle with leg lengths of 6.2 cm and 9.3 cm. The height of each profile is equal to the length of the side to which it is attached. If the largest profile has an area of  $25 \text{ cm}^2$ , what is the area of the smallest profile, shown here shaded? Express your answer as a common fraction.



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# MATHCOUNTS®

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2020  
■ Chapter Competition ■  
Target Round  
Problems 7 & 8

Name \_\_\_\_\_

School \_\_\_\_\_

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Problem 7	Problem 8	Scorer's Initials

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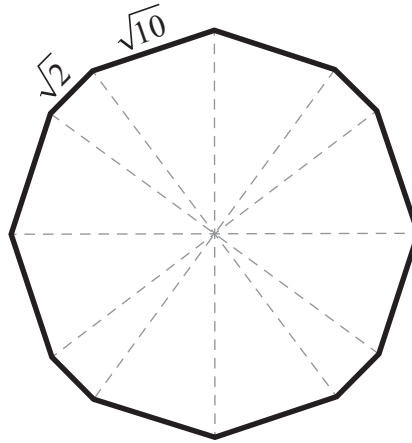
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7. \_\_\_\_\_ m<sup>2</sup> The polygon shown is a dodecagon with six diagonals, each of length 10 meters and intersecting at its center. This polygon has 8 sides of length  $\sqrt{10}$  meters each and 4 sides of length  $\sqrt{2}$  meters each. What is the area of this dodecagon?



8. \_\_\_\_\_ percent The bar graphs shown give the probability for Team North and Team South to each score a specified integer number of goals per period. Based on this data and assuming the numbers of goals scored by each team are independent of each other, what is the probability that Team South will be in the lead at the end of the first period? Express your answer as a percent to the nearest whole number.

