MATHCOUNTS®

2024 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.

Problem 1	Problem 2	Scorer's Initials

1. _____ picnic tables   There are 130 members of the Kelly family attending the family reunion cookout at the park. Each picnic table at the park seats eight people. What is the minimum number of picnic tables needed when the entire family sits down to eat together?

2. _____ in²   Yang arranges one 4 × 4-inch square tile and five 2 × 2-inch square tiles to form one large square. With no overlapping tiles and no space between adjacent tiles, what is the area of the large square?

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2024 CHAPTER COMPETITION
Target Round Problems 3 & 4

Name _____

School _____

DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.

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Problem 3	Problem 4	Scorer's Initials

3. _____ minutes   A bus is traveling from Houston, Texas to Iowa City, Iowa, a distance of 1200 miles. When moving, the bus's average speed is 60 mi/h. However, throughout the trip, the bus makes a number of rest stops. If the bus's average speed over the entire trip, including the rest stops, is only 48 mi/h, how many minutes in total does the bus spend at rest stops over the course of the trip?

4. _____ cm   In the figure shown, rectangle ABCD has AB = 323 cm and AD = 204 cm. Isosceles triangle AEF is inscribed in rectangle ABCD with AE = AF = 325 cm. What is the length of segment EF?

A   323 cm   B
                E
204 cm

D   F   C

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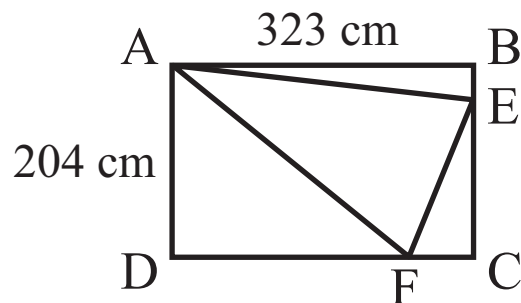
Name _____

School _____

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DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.

Problem 5	Problem 6	Scorer's Initials

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5. _____ If $f(x) = 3x - 27$, what is the greatest real number x for which $f(x^2) = (f(x))^2$?

6. $ _____ In Mathcountia, the currency denominations are $1, $9, $81 and $729. If Coda has 500 pieces of Mathcountia currency whose total value exceeds $10,000, what is the least possible total value of Coda's currency?

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2024 CHAPTER COMPETITION
Target Round Problems 7 & 8

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Name _____

School _____

DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.

Problem 7	Problem 8	Scorer's Initials

02-C24TAR7

7. _____ mL   A container holding 9 mL of solution is 50% syrup by volume. After adding some pure water to make the solution 30% syrup by volume, how many milliliters of solution are in the container?

8. _____ lily pads   Shrinky the frog wants to hop on some of the lily pads in the 5 × 5 grid shown. Shrinky may start at any lilypad, and each hop is a straight line to the center of another lilypad. However, Shrinky gets tired as she jumps, and so each hop after the first must be shorter than the previous hop. Furthermore, Shrinky is not allowed to visit a lilypad more than once. One possible sequence of hops is shown. What is the largest number of lily pads Shrinky could visit using a sequence of hops?