

MATHCOUNTS®

2023 CHAPTER COMPETITION Target Round Problems 1 & 2

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

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1. \$ _____

Alton paid \$31.50 for 15 coloring books and 3 boxes of crayons.
A coloring book costs half as much as a box of crayons.
How much does one coloring book cost?



2. _____ seconds

A fortnight is a period of time measuring two weeks. If a microfortnight is defined to be one millionth of a fortnight, how many seconds long is a microfortnight? Express your answer as a decimal to the nearest hundredth.

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2023 CHAPTER COMPETITION Target Round Problems 3 & 4

Name _____

School _____

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Problem 3	Problem 4	Scorer's Initials

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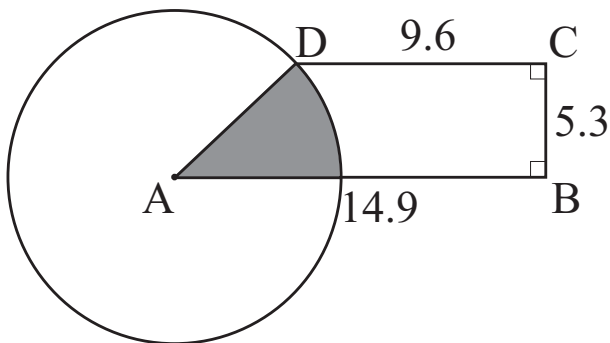
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3. _____ In the following sequence, each term is the sum of the two previous terms: a , b , c , d , 8, 15, 23, 38, 61. What is the value of $a + c$?

4. _____ cm^2 In trapezoid ABCD, shown here, vertex A is the center of the circle, vertex D lies on the circle, and vertices B and C are right angles. If $AB = 14.9$ cm, $BC = 5.3$ cm and $DC = 9.6$ cm, what is the area of the shaded sector of the circle? Express your answer as a decimal to the nearest tenth.



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2023 CHAPTER COMPETITION Target Round Problems 5 & 6

Name _____

School _____

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Problem 5	Problem 6	Scorer's Initials

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5. _____ blocks

Four friends, Wally, Eli, Yuko, and Sam, live in different neighborhoods and commute to school every day by bus. Eli's neighborhood is half as far from school as Wally's. Yuko travels as far as the total distance traveled by Wally and Eli. Sam travels 3 times the distance that Wally travels. How many blocks does Wally travel to school if the friends together travel 888 blocks?



6. _____

Suppose that 4 letters are chosen at random without replacement from the phrase "MAZAMORRA MORADA." What is the probability that the four letters chosen can be arranged to spell AMOR? Express your answer as a common fraction.

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2023 CHAPTER COMPETITION Target Round Problems 7 & 8

Name _____

School _____

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Problem 7	Problem 8	Scorer's Initials

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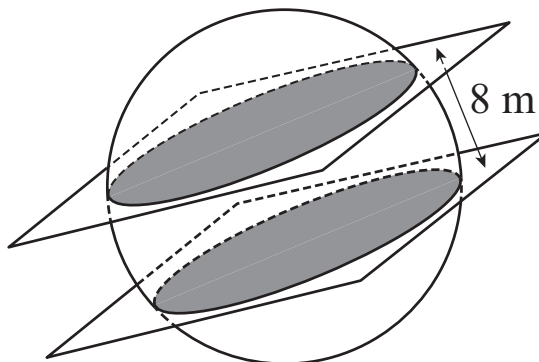
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7. _____ m^2

Two parallel planes a distance of 8 meters apart intersect a sphere. Each of the circles where the planes intersect the sphere has an area of $128\pi \text{ m}^2$. What is the surface area of the sphere? Express your answer in terms of π .



8. _____

Each workday when Kate arrives at the office, she does one of the following: either Kate says “Good morning” to her coworkers, or Kate says nothing to her coworkers. On Monday, Kate says “Good morning” to her coworkers. If on each subsequent day there is a 75% chance that she will repeat her previous day’s behavior, what is the probability that on Friday Kate says “Good morning” to her coworkers? Express your answer as a common fraction.