

# MATHCOUNTS®

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## 2024 STATE COMPETITION Target Round Problems 1 & 2

Name \_\_\_\_\_

School \_\_\_\_\_

Chapter \_\_\_\_\_

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**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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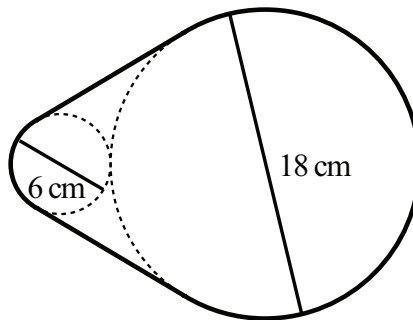
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1. \_\_\_\_\_ ounces

A glass jar holding identical cotton balls weighs 16 ounces. When the number of cotton balls in the glass jar is tripled, the total weight of the glass jar is 24 ounces. How many ounces does the empty glass jar weigh?

2. \_\_\_\_\_ cm

The figure shows the cross-section when Uri wraps a piece of wire around two logs, one of diameter 6 cm and one of diameter 18 cm. What is the total length of the shortest piece of wire that can be wrapped around both logs as shown? Express your answer to the nearest whole number.



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## 2024 STATE COMPETITION Target Round Problems 3 & 4

Name \_\_\_\_\_

School \_\_\_\_\_

Chapter \_\_\_\_\_

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Problem 3	Problem 4	Scorer's Initials

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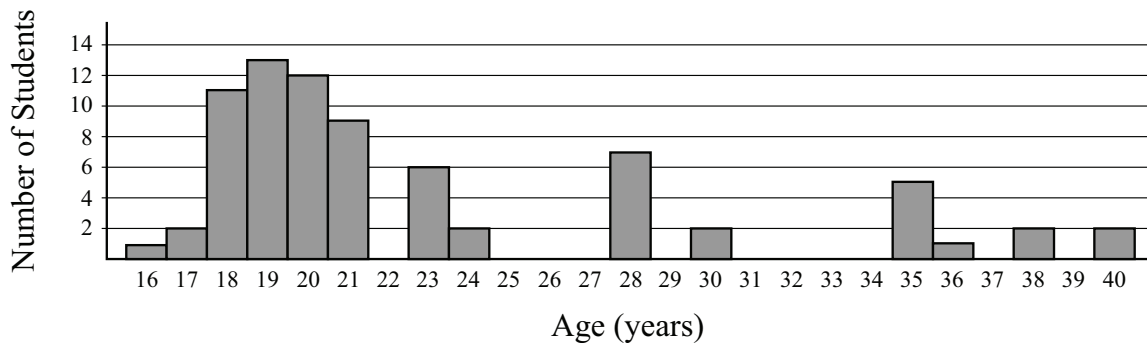
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3. \_\_\_\_\_ people     A group of 84 people attended the zoo field trip. For the trip to the zoo, 63 people rode the bus and the remaining people were in cars with 3 people in each car. On the return trip, the same cars carried 4 people each, and the remaining people rode the bus. How many people rode the bus on the return trip?

4. \_\_\_\_\_ years     The histogram shows the ages of the people who attended a book signing for a popular author. What is the absolute difference in years between the median age and the mean age of the attendees? Express your answer as a decimal to the nearest tenth.

**Ages of Book Signing Attendees**



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## 2024 STATE COMPETITION Target Round Problems 5 & 6

Name \_\_\_\_\_

School \_\_\_\_\_

Chapter \_\_\_\_\_

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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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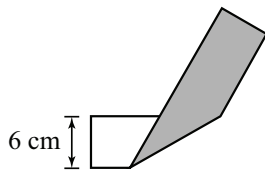
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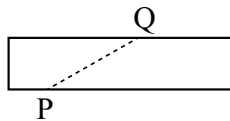
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5. \_\_\_\_\_ mush-  
rooms On Monday, 5 mushrooms popped up in Sean’s yard. On Tuesday, 15 new mushrooms popped up, for a total of 20 mushrooms. On Wednesday, 45 new mushrooms popped up. On Thursday, 135 new mushrooms popped up. If this pattern continues with the number of new mushrooms tripling each day, in total, how many mushrooms will be in Sean’s yard at the end of the day on Sunday?

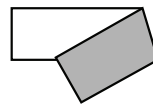
6. \_\_\_\_\_ cm In Step 1, a strip of paper, 6 cm wide, is folded as shown. In Step 2, the paper is unfolded and the crease is labeled segment PQ. In Step 3, a second fold is made through point Q so that the edge of the strip coincides with segment PQ as shown. In Step 4, the paper is unfolded and the other endpoint of the second crease is labeled point R. Given that the area of triangle PQR is  $36 \text{ cm}^2$ , what is QR? Express your answer as a decimal to the nearest hundredth.



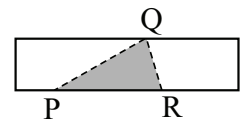
Step 1



Step 2



Step 3



Step 4

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## 2024 STATE COMPETITION Target Round Problems 7 & 8

Name \_\_\_\_\_

School \_\_\_\_\_

Chapter \_\_\_\_\_

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

Problem 7	Problem 8	Scorer's Initials

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7. \_\_\_\_\_ cm Matthew draws points A, B, C, D and E on a piece of paper. The lengths of segments AB, BC, CD are 4 cm, 3 cm and 7 cm—not necessarily in that order. The lengths of segments DE, AD and AE are 14 cm, 23 cm and 19 cm, also not necessarily in that order. What is the length of segment AD?

8. \_\_\_\_\_ % Four baking teams compete in a tournament consisting of two semifinal rounds and a final round, as shown. Both the semifinals and the final round are a series of best-of-five matches. Once a team has won enough matches to clinch a series victory, no more matches are played in that series, and no match ever ends in a tie. If the higher ranked team has a  $\frac{2}{3}$  chance of winning any particular match, what is the percentage probability that the Connorstown Confectioners will win the tournament? Express your answer to the nearest hundredth of a percent.

Rank	Team
1	Appleton Almondines
2	Belleville Biscuiteers
3	Connerstown Confectioners
4	Durham Durum

