# MATHCOUNTS®

## 2019
## ■ 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 |
|-----------|-----------|-------------------|
|           |           |                   |
|           |           |                   |

1.  $ _____   Every week, Nora buys six oranges priced $0.49 each. If the price of an orange increases from $0.49 to $0.69, how much will the cost of six oranges increase?
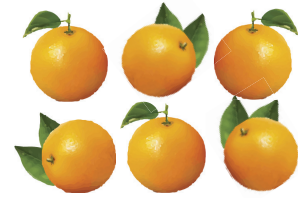
2.  _____   Chris graphs the line $y = 3x + 7$ in the coordinate plane, while Sebastian graphs the line $y = ax + b$, for some numbers $a$ and $b$. The $x$-intercept and $y$-intercept of Sebastian's line are double the $x$-intercept and $y$-intercept of Chris's line, respectively. What is the value of the sum $a + b$?

# MATHCOUNTS®

**2019**

■ **Chapter Competition** ■
**Target Round**
**Problems 3 & 4**

Name _____

School _____

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

| Problem 3 | Problem 4 | Scorer's Initials |
|---|---|---|
|  |  |  |
|  |  |  |

02-C19TAR3

0
1
2
3
4
5
6
7
8
9

3. _____ points   In an amateur basketball league, a game consists of two 20-minute halves. In the first 12 minutes of a game between the Cubes and the Bisectors, the Cubes have scored 21 points while the Bisectors have scored 18. If each team maintains its scoring pace, by how many points will the Cubes beat the Bisectors?

4. _____ degrees   Concave quadrilateral ABCD is symmetric about the line AC. The measures of angles DAB and ABC are 84 degrees and 32 degrees, respectively. The dashed line segments bisect angles ABC and ADC. What is the degree measure of the acute angle at which the two dashed line segments intersect?

| | 0 |
| --- | --- |
| | 1 |
| | 2 |
| | 3 |
| | 4 |
| | 5 |
| | 6 |
| | 7 |
| | 8 |
| | 9 |
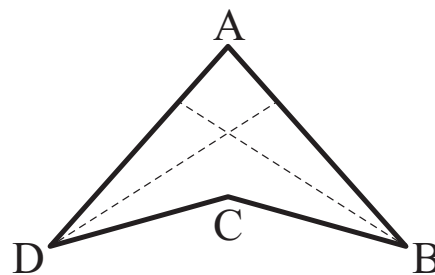
# MATHCOUNTS®

## 2019
## ■ Chapter Competition ■
## Target Round
## Problems 5 & 6

Name _____

School _____

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

| Problem 5 | Problem 6 | Scorer's Initials |
| --- | --- | --- |
| | | |
| | | |

5. _____  Two squares are placed, as shown, so that a vertex of the larger square, ABCD, is at the center of the smaller square, PQRS. If the squares have areas in the ratio 3:1, what fraction of the area of square PQRS is shaded? Express your answer as a common fraction.

P ___ Q
A
S / R , B
D
C
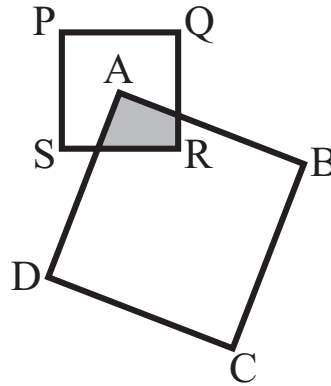
6. _____  Lisa wants to use her calculator to square a two-digit positive integer, but she accidentally enters the tens digit incorrectly. When she squares the number entered, the result is 2340 greater than the result she would have gotten had she correctly entered the tens digit. What is the sum of the two-digit number Lisa entered and the two-digit number she meant to enter?

# MATHCOUNTS®

## 2019
## ■ Chapter Competition ■
## Target Round
## Problems 7 & 8

0
1
2
3
4
5
6
7
8
9

Name _____

School _____

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

| Problem 7 | Problem 8 | Scorer's Initials |
|---|---|---|
|  |  |  |
|  |  |  |

# Raytheon

**2019 MATHCOUNTS**
**National Competition Sponsor**

7. _____ paths    In this figure, how many paths go to the right and down along connected segments from point A to point B?

A

B
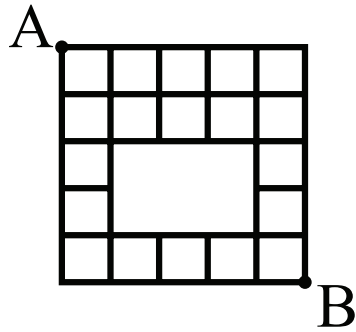
8. _____    Louise randomly assigns the values 1, 2, 3, 4, 5 and 6 to the variables $T$, $H$, $E$, $L$, $M$ and $A$, using each value exactly once. What is the probability that $(M - A)(T - H)(L - E)(T - E) = 1$? Express your answer as a common fraction.