
MATHCOUNTS[®]

2013

■ School Competition ■
Team Round
Problems 1–10

Team
Members _____, Captain

DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.

This section of the competition consists of 10 problems which the team has 20 minutes to complete. Team members may work together in any way to solve the problems. Team members may talk to each other during this section of the competition. 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. The team captain must record the team's official answers on his/her own competition booklet, which is the only booklet that will be scored. If the team completes the problems before time is called, use the remaining time to check your answers.

Total Correct	Scorer's Initials

National Sponsors

Raytheon Company * Northrop Grumman Foundation *
U.S. Department of Defense *
National Society of Professional Engineers * CNA Foundation *
ConocoPhillips * Texas Instruments Incorporated *
3M Foundation * Art of Problem Solving * NextThought

Raytheon

2013 MATHCOUNTS
National Competition Sponsor

Founding Sponsors: National Society of Professional Engineers, National Council of Teachers of Mathematics and CNA Foundation

Copyright MATHCOUNTS, Inc. 2012. All rights reserved.

1. _____ coins Using only quarters and dimes, what is the least number of coins that would give Sally a total of \$7.15?

2. \$ _____ This table shows the items on the equipment lists submitted to sponsors by two softball teams.

<i>Equipment</i>	<i>Girls' Team</i>	<i>Boys' Team</i>
Bats	12	15
Balls	45	38
Gloves	15	17

Each bat costs \$80, each ball costs \$6 and each glove costs \$60. What is the total cost of all the equipment requested by the two teams?

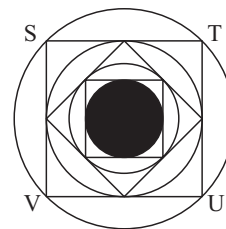
3. _____ pigs Using 10 pounds of grain, how many pigs can be fed along with 20 chickens provided that one pound of grain can feed five chickens or one pound of grain can feed two pigs?

4. _____ revolutions If a tire has a radius of 8 inches, how many revolutions will it take to travel 100 yards? Express your answer to the nearest whole number.

5. _____ The denominator of a fraction is one more than seven times its numerator. If three is added to the numerator and seven is subtracted from the denominator, the resulting fraction is equal to $\frac{5}{8}$. What is the original fraction?

6. _____ An operation \blacktriangledown is defined as $m \blacktriangledown n = m - 4n$. What is the value of $20 \blacktriangledown (6 \blacktriangledown 4)$?

7. _____ units^2 Square STUV with side length 2 units is inscribed in a circle and circumscribes another circle, as shown. If each circle or square is inscribed in the next larger figure, starting with the shaded circle, what is the area of the shaded circle? Express your answer as a common fraction in terms of π .



8. \$ _____ On the highway, the Millers can drive their car 30 miles per gallon of gas, while they can drive their truck only 20 miles per gallon of gas. If gasoline costs \$4 per gallon, what is the positive difference in the amount the Millers will spend on gas using the car to drive 120 miles on the highway and the amount they will spend on gas using the truck to make the same trip?

9. _____ What is the value of $(9 + 12 + 15 + 18)^3 - ((-9) + (-12) + (-15) + (-18))^3$?

10. _____ Let S be the set of positive integers that leave a remainder of 12 when divided into 192. What is the median of set S?