
MATHCOUNTS®

2005

■ Chapter Competition ■
Target Round
Problems 1 and 2

Name _____

School _____

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

This round 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. Record your final answer in the designated space on the problem sheet. All answers must be complete, legible and simplified to lowest terms. This round assumes the use of calculators, and calculations may also be done on scratch paper, but no other aids are allowed.

Total Correct	Scorer's Initials

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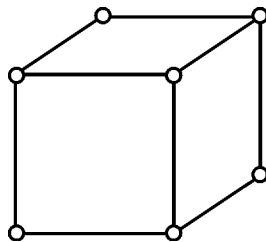
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1. Francisco starts with the number 5, doubles it, adds 1, doubles the result, adds 1, doubles the result, adds 1, and continues this pattern of two alternating calculations. Phong, meanwhile, starts with 5, adds 1, doubles the result, adds 1, doubles the result, adds 1, doubles the result, and continues this pattern of two alternating calculations. They each do eight total calculations. What is the positive difference of their final results?

1. _____

2. All vertices of this cube will be colored such that no two vertices on the same edge of the cube are the same color. What is the minimum number of colors that will be needed to color the vertices of this cube?

2. _____ colors



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Problems 3 and 4

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3. A store purchases televisions from a factory for \$87.89 each. The store normally sells one of these televisions for 225% of the factory cost, but a store coupon gives 25% off this selling price. Ignoring tax, how much does a customer with this coupon pay for the television? Express your answer in dollars to the nearest hundredth.

3. \$ _____

4. The symbols \triangle , \square , \hexagon and \trapezoid represent four different integers from 1 to 9. Using the equations below, what is the value of \square ?

4. _____

$$\triangle + \square = \trapezoid$$

$$\triangle + \triangle = \hexagon + \hexagon + \hexagon + \hexagon + \hexagon$$

$$\triangle + \triangle = \trapezoid + \hexagon$$

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Target Round
Problems 5 and 6

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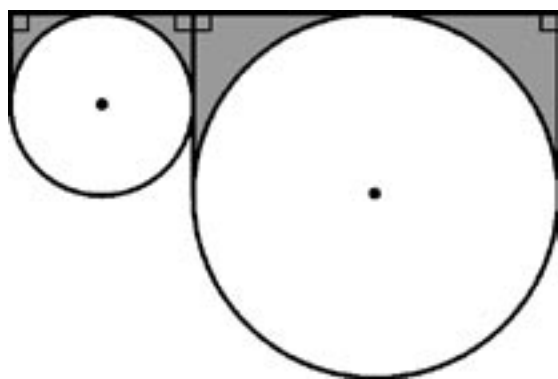
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5. What is the greatest whole number that MUST be a factor of the sum of any four consecutive positive odd numbers?

5. _____

6. In the figure below, the smaller circle has a radius of two feet and the larger circle has a radius of four feet. What is the total area of the four shaded regions? Express your answer as a decimal to the nearest hundredth.

6. _____ sq feet



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Target Round
Problems 7 and 8

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7. Jamie has a jar of coins containing the same number of nickels, dimes and quarters. The total value of the coins in the jar is \$13.20. How many nickels does Jamie have?

7. _____ nickels

8. John, Mike and Chantel will divide a pile of pennies amongst themselves using the following process:

8. _____ pennies

The number of pennies in the pile is counted.

- If the number of pennies in the pile is even, Mike will get half of the pile.
- If the number of pennies in the pile is odd, one penny will be given to Chantel, and John will get half the pennies remaining in the pile.

This process is then repeated until the pile is empty. How many pennies will Mike have at the end if the original pile contains 2005 pennies?