2019  
State Competition  
Target Round  
Problems 1 & 2

Name  
__________________________________________

School  
__________________________________________

Chapter  
__________________________________________

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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.

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1. _______ feet  An architectural scale drawing of a classroom is 9 inches by 12 inches. The area of the actual classroom is 768 ft\(^2\). What is the actual length of the longer side of the classroom?

2. _______ units\(^2\)  Triangle ABO has vertices A(6, 12), B(12, 9) and O(0, 0). What is the area of triangle ABO?
2019
State Competition
Target Round
Problems 3 & 4

Name

School

Chapter

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3. _________%  Pismo clams may be harvested along the California coast from September 1st through April 30th. In a non-leap year, during what percent of the year can clams not be harvested? Express your answer to the nearest tenth.

4. _______ integers  How many of the first 2018 positive integers have an odd number of positive factors?
2019
State Competition
Target Round
Problems 5 & 6

Name ____________________________________________

School ____________________________________________

Chapter ____________________________________________

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5. ________ points  The Rockets had 6995 possessions during the first 70 basketball games of the season. With those possessions, the team made 1019 baskets worth three points each, 1797 baskets worth two points each and 1421 baskets worth one point each. If only one, two or three points are awarded for making baskets, on average, during those 70 games, how many points did the Rockets score per 100 possessions? Express your answer as a decimal to the nearest thousandth.

6. ________ cm²  In the figure, square ABCD is divided into eight congruent right triangles and square EFGH, as shown. If the area of square ABCD is 1156 cm² and the area of square PQRS is 676 cm², what is the area of square EFGH?
2019
■ State Competition ■
Target Round
Problems 7 & 8

Name

School

Chapter

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7. ___________ Andy has a cube of edge length 8 cm. He paints the outside of the cube red and then divides the cube into smaller cubes, each of edge length 1 cm. Andy randomly chooses one of the unit cubes and rolls it on a table. If the cube lands so that an unpainted face is on the bottom, touching the table, what is the probability that the entire cube is unpainted? Express your answer as a common fraction.

8. ___________ The sequence $a_n$ is defined by $a_1 = 20$, $a_2 = 19$ and for $n \geq 3$, $a_n = |a_{n-1}| - |a_{n-2}|$. What is the value of $a_{2019}$?