

2010 Orange County Math Circle All-Girls Tournament  
Grade 7 - 8 Target Round

Name:

School:

Grade:

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1. Cameron rolls three standard six-sided dice once. What is the probability that the sum of the numbers rolled will be greater than 3? Express your answer as a fraction.

\_\_\_\_\_ (fraction)

2. What is the sum of the first 10 terms of the following sequence?

$-20, -16, -12, -8, \dots$

\_\_\_\_\_ .

3. The Fibonacci sequence is  $1, 1, 2, 3, 5, 8, \dots$ . Each number after the first two numbers is the sum of the preceding two numbers. What is the first perfect square greater than 1 to occur in this sequence?

\_\_\_\_\_ .

4. Given that  $8\clubsuit 2 = 8 + 9 = 17$  and  $6\clubsuit 3 = 6 + 7 + 8 = 21$ , find  $(5\clubsuit 4)\clubsuit 3$ .

\_\_\_\_\_ .

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5. A train from Los Angeles to San Diego leaves every hour on the hour. A train from San Diego to Los Angeles leaves every hour on the half-hour. The trip between the two cities takes three hours. How many trains going in the opposite direction does a train from Los Angeles to San Diego pass?

\_\_\_\_\_ (trains)

6. Four positive four-digit integers with a sum of 23,750 each contain the digit 1 in a different position. If the 1s are all removed, the list of integers became 982, 829, 982, 298. What was the last four-digit number in the original list?

\_\_\_\_\_

7. Every student in an 8th grade math competition shakes hands with every other 8th grader, for a total of 306 handshakes. How many students are in the class?

\_\_\_\_\_ (students)

8. A special deck of cards consists of green cards and yellow cards. The probability of randomly selecting a green card from the deck is 3 : 5. If there are 40 cards in the deck, how many yellow cards are there in the deck?

\_\_\_\_\_ (yellow cards)