

SEATTLE INFINITY MATH CIRCLE



Mock MathCounts Test 2011

Written by: Albert Chu

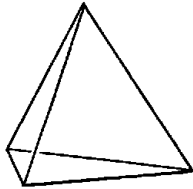
MATHCOUNTS

Target Round Problems 1 & 2

Name: _____

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1. A tetrahedron has four vertices. We can label each vertex by one of the four digits: 1, 2, 3, 4. How many non-congruent ways are there to assign a different digit to each vertex of a tetrahedron? Tetrahedra are considered congruent through rotation. Reflections are considered different.



1. _____

2. Choose 4 digits from the set $\{1, 2, 3, 4\}$ with replacement to form 4-digit numbers. How many of them have at least one of their digits repeated?

2. _____

Score: _____

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Mock MathCounts Test 2011

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MATHCOUNTS

Target Round Problems 3 & 4

Name: _____

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3. A 6-by-6 chess board has 36 tiles. When two tiles are randomly chosen, what is the probability that these two tiles share an edge?

3. _____

4. A trapezoid has two parallel sides and their lengths are 7 and 12. The lengths of the other two sides are 3 and 4. Find the area of this trapezoid.

4. _____

Score: _____

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Mock MathCounts Test 2011

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Target Round Problems 5 & 6

Name: _____

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5. Consider a set of integers: $S = \{1, 2, 3, 4, 5, 6\}$. What is the number of non-congruent triangles that can be formed by using three integers in set S ?

5. _____

6. Find the remainder when 2^{2011} is divided by 7.

6. _____

Score: _____

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Mock MathCounts Test 2011

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MATHCOUNTS

Target Round Problems 7 & 8

Name: _____

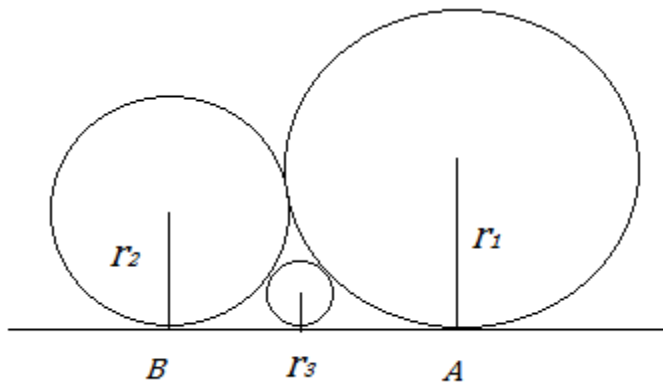
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7. In how many ways can 126 be written as sum of two or more consecutive positive integers?

7. _____

8. Three circles are tangent to each other, as shown below. Three radii are: r_1 (largest circle), r_2 (medium circle), and r_3 (smallest circle). If $r_1 = 10$ and $r_3 = 2$. Find the value of r_2 .

8. _____



Score: _____