

2008 - 2009 Log1 Contest Round 3
Theta Individual

Name: _____

4 points each		
1	What is the sum of the first 5 Fibonacci numbers if the first two are 1, 1?	
2	If two cards are drawn from a standard 52 card deck, what is the probability of drawing a red king and a black queen?	
3	How many regular polygons can tessellate a plane?	
4	A cube of side length 2 has its side lengths increased by a factor of 3. By how much has the surface area increased?	
5	What is the volume of a right circular cylinder with radius 2π and height 2009?	

5 points each		
6	Stacey decides to add the numbers from 1 to her favorite number. If she gets a sum of 447, and realizes that she forgot to add one number, what is Stacey's favorite number?	
7	How many integer factors does 2009 have?	
8	What is the probability that I get 5 heads when I flip 8 fair coins?	
9	If $a + b = \frac{5}{6}$ and $a^2 + b^2 = \frac{13}{36}$, then what is the value of $a^3 + b^3$?	
10	Using 5 chords to cut a circle, what is the maximum number of pieces that can be made?	

6 points each		
11	An equilateral triangle is inscribed in a circle that is inscribed in another equilateral triangle. If a point is selected at random inside the larger triangle what is the probability that the point will lie inside the circle but outside the smaller triangle?	
12	What is the remainder when $x^5 + 3x^4 - 4x^3 + 2x^2 - 5x + 1$ is divided by $x + 1$?	
13	What is the greatest common factor of 3397 and 2449?	
14	How many integer values of n exist such that $2 < \sqrt[4]{2009} < 10$?	
15	What is the total distance travelled by a ball that rebounds to $\frac{6}{7}$ of its drop height when dropped from a 2009 foot building?	