



Knights of Pi Math Tournament – May 16, 2009
Numbers & Operations 5th/6th

1	Evaluate: $2009^2 - 2008^2$
2	If the letters $k, n, i, g, h, t,$ and s represent the numbers 1, 2, 3, 4, 5, 6, and 7, respectively, what is the value of $(k - s)(n - t)(i - h) \dots (h - i)(t - n)(s - k)$?
3	Find the sum of the digits of the count of the integers between 1000 and 9000, not inclusive.
4	What is half of two thirds of three fifths of five sevenths of seven elevenths of 143?
5	Find the 83 rd term of the following sequence: 4, 7, 10, 13, 16 ...
6	Find the sum of all two-digit positive integers that contain only the digits 2, 4, 6, and 8.
7	How many digits does x have if the prime factorization of x is $2^9 \times 5^{11} \times 7$?
8	Trig N. Metric Middle School has 900 students, and each student takes 7 classes a day. Each class has 30 students and one teacher, and each teacher teaches 5 classes. How many teachers must there be at Trig N. Metric Middle School?
9	On a full tank of gasoline, the number of miles that Tony's car can drive is equal to the least common multiple of 75 and 125. If Tony's car has $\sqrt{1 \div a}$ of a tank left, where a is the greatest common factor of 75 and 125, how many more miles can he drive?
10	Evaluate: $3 - 6 + 9 - 12 + \dots + 723 - 726 + 729$
11	What is the sum of the digits of $a \times b \times c$ if a is the sum of the digits of the sum of the positive integer factors of 12, b is the sum of the digits of 2 to the sixth power, and c is the sum of the digits of the number of degrees in a sector that makes up $\frac{3}{72}$ of a circle?
12	When $(3\frac{1}{3} \times \frac{1}{5}) \div (\frac{2}{5} - \frac{21}{75})$ is simplified and written as a decimal, what is the 10 th digit after the decimal point?
13	At the beginning of day one, Austin has 46 candies in a jar. He eats one candy that day. Each day after day one, his mother adds one candy to the jar, and then he eats one more candy than he did the day before. On what day will Austin eat the last of his candies?
14	Andrew has an infinite supply of bowls and 78 chocolates. What is the maximum number of bowls he can use to store all of his chocolates if each bowl used must contain at least one chocolate and no two bowls may contain the same number of chocolates?
15	How many of 10626's factors are prime?
16	How many positive integer factors does 1404 have?
17	Find the average of all four-digit numbers where all the digits are 1, 3, 5, or 7.
18	Shawn has five boxes. When he weighs them in pairs, the results in pounds are 467, 481, 495, 514, 522, 528, 542, 555, 569, and 583. What is the total weight of all five boxes?
19	What is the sum of the digits of the integers from 1 to 100, inclusive?
20	The sum of the first five terms of an arithmetic sequence is 2320. The sum of the first ten terms is 9040. What is the sum of the first twenty terms?