Knights of Pi Math Tournament – December 20th, 2014

Individual Test 5th/6th

1	How many integers less than 50 are multiples of 7 but not of 5?
2	How many positive integer solutions are there to the equation 6wxyz+2015xyz = - 4030?
3	25 is 125% of what number?
4	Evaluate: 1 - 2 + 3 - 4 + … + 61 - 62.
5	A clock tower rings every 7 hours, starting from right now, midnight on monday. How many times does it ring between now and exactly 5 days from now?
6	George the Genie is thinking of a number. He tells you that the number has two digits, its two digits have a product of 12, and it is prime. What is his number?
7	Compute the following sum: 101 + 202 + 303 +404
8	An arithmetic sequence has a first and last term of 7 and 55 respectively. If the sum of all its terms is 341, how many terms are there?
9	If a square has diagonal length of $\sqrt{42}$, what is its area?
10	A cylinder has a surface area of 72pi + 120. Its radius is 6. What is its volume?
11	In a certain clique, each friend's height is listed as follows in inches: 55, 57, 56, 55, 70, 58, what is the probability that a random person selected from the clique is taller than the mean height of the clique?
12	Egor has a big ego. Every day he wears special shoes that make him bigger. Normally he weighs 50 kilograms. If he wears the shoes, he weighs 57 kilograms. If Tommy the tall guy who normally weighs 62 kilograms wears Egor's shoes, how much will Tommy weigh?
13	Rommel owns 5 dogs. He has 5 identical dog treats, and he wants to give them to his dogs. Each treat can only be eaten by one dog, and each dog must have exactly one treat. In how many ways can Rommel give out the treats?
14	A trapezoid has base lengths 5 and 9, and its slant lengths are both 6. What is the trapezoid's area?
15	What is the numerical sum of the number of sides of a pentagon and the interior angle measure of a regular hexagon in degrees?
16	What is the largest two digit number that both 3 and 7 divide?
17	Compute 14641 to the one fourth power
18	Find the value of the following expression: 1+2+3+4+5+.....+35+36
19	Every day, Jonah leaves his house to go to school at 7:55 AM. If it takes him 15 minutes to get to school, and he wants to arrive 5 minutes before school starts, when is the earliest time school can start so that Jonah arrives at his desired time?
20	How many ways can a first place winner be chosen from a pool of 15 contestants if Tommy, one of the contestants does not win?
21	There exists a prime number p such that 3 times p minus 1 is also prime. What is p?
22	A circle with radius 2 is entirely inside a circle with radius 5. If a random dart is thrown on the circle with radius 5, what is the probability that the dart lands outside the circle with radius 2?
23	What is the greatest prime factor of 357?
24	What is the larger root of the quadratic $x^2 - 7x+12$?
25	Find the largest square number smaller than 1000.

26	What is the probability a randomly chosen card from a 52 card deck is either a red card or a spade?
27	How many distinct ways can the letters of the word “ANACONDA” be rearranged?
28	What is the perimeter of a regular dodecagon with side length 5?
29	How many whole tables can I buy if each table costs 500 dollars, and i have 1950 dollars?
30	5 pencils and 3 erasers cost 8 dollars. 2 pencils and 1 eraser costs 3 dollars. How much does a pencil cost?
31	1. Statistics have shown that Zergling-Hydralisk rushes are effective against battles with Protoss. Kerrigan has 300 minerals and 300 Vespene Gases. If a Zergling costs 25 minerals, and a hydralisk costs 75 minerals and 25 Vespene Gases, how many different combinations of Zerglings and Hydralisks can Kerrigan make, assuming she doesn’t have to use up all her resources?
32	Find the sum of the infinite sequence: 1+1/2+1/4+1/8+..
33	How many cubes of side length 5 fit inside of a rectangular prism of side lengths 30, 35, and 50?
34	A math team consists of 6 people, including Mary, Stephen, and Han. Given that exactly half of the team likes juice, and that Mary does not like juice, what is the probability that both Stephen and Han do not like juice?
35	Bob has 5 two-sided coins, each of which have a ½, ⅓, ¼, ⅕, and ⅙ chance, respectively, to flip heads. What is the probability that Bob will flip an odd number of heads?
36	There exists triangle ABC such that AB = 6, AC = 9, and BC = 10. Point D is on BC such that AD bisects angle BAC. What is the length of AD?
37	A square on the coordinate plane has vertices (5,12),(-5,-12),(12,-5),and (-12,5). What is the length of the diagonal of this square?
38	Three distinct integers satisfy the equation 1/a + 1/b + 1/c = 1. What is the sum of the three integers a,b,c?
39	What is the probability that either an ace or a spade or both is drawn out of a standard 52-card deck?
40	What is the probability that for a randomly chosen integer value of x on the range 1 < x < 10, the expression x^3-x is divisible by 6?

