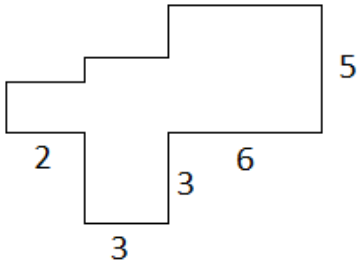
Knights of Pi Math Tournament – Dec. 15, 2012

Individual Test 5th/6th

1	How many sides does a regular five-pointed star have?
2	Gabby has twelve cookies, and Alisa has nineteen cookies. How many cookies do they have in total?
3	What is the measure, in degrees, of the third angle of a triangle with two angles measuring $50°$ and $80°$?
4	How many edges does a cube have?
5	Sonya's monkey eats three bunches of bananas a day. Each bunch has six bananas. How many bananas does her monkey eat every day?
6	Evaluate: 18×22.
7	Evaluate: $2 - \frac{(5-3)^2+4}{4}$
8	Ben and James each have identical pumpkin pies. Ben eats $2/3$ of his and James eats $3/4$ of his. If they put the remainder of their pies together, what fraction of a whole pie do they have left?
9	Eighteen is 30% of what number?
10	What is the surface area of a cube with side length 5?
11	What is the y-intercept of the line $y = 3x + 1$ in (x, y) form?
12	What is the sum of the first 8 positive integers?
13	Express $.\overline{8}$ as a fraction in simplified form.
14	Irving likes to eat goldfish, but he eats only the goldfish that have smiles on them. He has a package of 180 goldfish. If $4/9$ of them have smiles, how many goldfish in the package have smiles?
15	The sum of two numbers is 25, and their positive difference is 5. What is the smaller number?
16	A certain number x is multiplied by 12. The quantity $x - 3$ is also multiplied by 12. How much greater is the first product than the second?
17	Sam is standing at the North Pole of a spherical planet with diameter 1000 miles. What is the shortest distance, in miles, he must travel in his planet-buggy to reach the South Pole?
18	What is the area of a rectangle with integer side lengths if the length of the diagonal is $\sqrt{41}$?
19	What is the product of the single-digit prime numbers?

20	What is the product of the least common multiple and the greatest common factor of 6 and 9?
21	There are 24 students studying chemistry and 50 students studying calculus. If there are 55 students studying only chemistry or only calculus, how many students are studying both?
22	Through how many lattice points (points with integer x and y coordinates) does the line $2x + 6y = 101$ pass?
23	Five years ago, Eric was half the age of his brother Michael. Now his age is three-fifths of Michael's age. How old is Eric now?
24	What is the last digit of 2^{2013}?
25	There are ten green, ten red, ten blue, and ten black t-shirts in a box. What is the least number of t-shirts a person must pick at random to ensure that he has a shirt of each color?
26	A burlap bag has three black kittens and one white kittens. Two kittens are randomly chosen from the bag. What is the probability that both kittens are the same color?
27	Jack Harkness rolls two six-sided dice. If he rolls a sum of 7, Jack wins a bag of cool beans. What is the probability that he wins the cool beans?
28	There are two red pairs, two blue pairs, and two green pairs of socks in Sean's drawer. If Sean dresses in the dark and randomly pulls out two socks to wear, what is the probability that he puts on socks of the same color?
29	What is the range of the set $\{8, 4, 11, 13, 2, 3, 6, 9\}$?
30	What is the least number of cuts required to cut a block of tofu into eight pieces?
31	What is the positive difference between the square and cube of 6?
32	Five points are spaced evenly in a circle, and all possible lines connecting two points are drawn. How many lines are there?
33	What is the smallest positive integer with 4 positive divisors?
34	Today is Saturday, December 15. On what day of the week did the fourth of July this year fall?
35	Nina is stuck in a traffic jam. Her car, which is twelve feet long, moves at a rate of sixteen inches a minute. How many minutes will it take for her to travel one car length?
36	A right triangle has a hypotenuse of 10 feet. If the other side lengths are also an integer number of feet long, what is the sum of the squares of all three side lengths of the triangle?
37	If Andrew attends a math competition, Emily does not attend the competition. If Emily attends a math competition, Rose also attends the competition. If Emily went to KPMT, which of the following statements must be true (choose two)? A. Rose went to KPMT. B. Rose did not go to KPMT. C. Andrew went to KPMT. D. Andrew did not go to KPMT.

38	Three boys and two girls are standing in a line. In how many ways can they stand so every boy is standing next to another boy and every girl is standing next to another girl?
39	In the following figure, all angles are right angles and side lengths are as labeled. What is the perimeter of the figure? 
40	The inner circle of the rug below has a diameter half that of the rug, and each of the inner angles formed by the three radials is $120°$. Jordan's cat randomly picks a place on the rug to take a nap. What is the probability that his cat is sleeping in the shaded region?