Knights of Pi Math Tournament – Dec. 15, 2012

Speed Math 7th/8th

1	Evaluate $17 + 31 - 56$.
2	Penelope sees three antelope on Monday, two zebras on Tuesday, four giraffes on Wednesday, six lions on Thursday, and one polar bear on Friday. How many animals did she see in total during those five days?
3	What is the greatest common factor of 105 and 42?
4	What is the area of a circle with a circumference of 3π?
5	What is the next term in the sequence: $100, 91, 82, 73, 64, \_\_$?
6	Clarissa randomly draws a card from a deck of 52 cards. Sebastian guesses which card she drew. What is the probability that he is correct?
7	Square $CAKE$ has side length 4. Point Y lies on CE. What is the area of triangle YAK?
8	What is the perimeter of a square made by connecting four smaller squares, each with a perimeter of 36?
9	Find the value of x if $3x + 2y = 15$ and $x + y = 5$.
10	Joey has eight classes a day, and each class is fifty minutes long. How many minutes does he spend in class every day?
11	Francine has three hats, four scarves, and seven pairs of gloves. How many different outfits consisting of one hat, one scarf, and one pair of gloves could she make?
12	Siri found seven gas stations, four coffee shops, and eight restaurants close to you. How many locations did Siri find in total?
13	Alex spends one third of a day sleeping, two hours tying his shoes, one fourth of the day in class, one twelfth of the day doing homework, and three hours eating. How many hours each day does he have left to play NarioLart?
14	Whenever I press the "+" button on my calculator, my calculator multiplies my number by two instead. If the display started out reading 7 and I pressed the "+" button until it read 102, how many times did I press the "+" button?
15	Donna rolls a die and flips a coin. What is the probability that she gets a 1 and tails?
16	What is the prime factorization of 153?
17	There are 18 rabbits in a hat. Five of them are brown, three are black, and the rest are purple. If I randomly pull out a rabbit, what is the probability that it is purple?

18	Let the x-coordinate of point A be chosen from the set $\{1,2,3,4,5\}$ and the y-coordinate be chosen from the set $\{8,9,10\}$. How many possible locations are there for point A?
19	Thirteen people meet for a business meeting. Each person shakes hands exactly once with every other person. How many handshakes occur?
20	Convert 10011001_2 into hexadecimal (base 16).
21	Anita licks exactly three penguins at every zoo she visits. If Anita has licked a total of 51 penguins, how many zoos has she visited?
22	Points A, B, C, and D lie on line l. Point E does not lie on line l. If three of these five points are chosen at random, what is the probability that they will form a non-degenerate triangle?
23	Find the remainder when 5^{38} is divided by 4.
24	What are all possible values of x when $x^2 - x - 12 = 0$?
25	What is the difference between the largest and smallest number of pieces into which five distinct cuts can cut a pizza?
26	Find the value of the series $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \cdots$
27	Find the sum of the roots of the equation $x^2 + 9x - 20 = 0$.
28	Kevin's pet unicorn trots at 2 ft/s. If Kevin is standing twelve feet away, how long will it take for his unicorn to trot to where he is standing?
29	In how many ways can Jessica choose two of her five cats to go to the vet today?
30	Find the smaller angle, in degrees, formed by the hour and minute hands of an analog clock at $3{:}\,50pm$.
31	A line has a slope of -2. If the points $(4,3)$ and $(1,k)$ lie on the line, what is the value of k?
32	What is 10% of 16% of 25% of 75% of 100? Express your answer as a decimal.
33	The Tower of London has 300 steps. If Emma climbs at a rate of two steps every three seconds, how many seconds will it take her to climb to the top?
34	How many minutes are in two years?
35	In how many ways can Santa hitch his eight reindeer to his sleigh in four rows of two reindeer each? 
36	Santa is categorizing 2000 children as either good or bad. So far he has labeled $1/4$ of them as good and $3/5$ of them as bad. How many children does he have left to categorize?

37	A classroom of children currently has eleven girls and fourteen boys, but one girl and two boys are absent. What is the ratio of the number of girls to the number of boys when all children are present?
38	Triangle PIE has an area of 5. Triangle YUM is similar to PIE, and its corresponding side lengths are three times those of PIE. What is the area of YUM?
39	How many rearrangements of the letters in the word "TOTO" are there, including the original spelling?
40	Every other day, Ke$ha wakes up feeling like P. Diddy. Every third day, Fun stays up cashing in his bad luck. Every fifth day, Carly Rae Jepsen throws a wish in a well. If all three events happened today, in how many more days will all three events happen?
41	Isosceles triangle TOE has a $40°$ angle at E and base TO. Point P is on ET so that $TO = OP$. What is the measure, in degrees, of angle EPO?
42	What is the next term in the sequence $2, 5, 7, 12, 19, \_\_$?
43	Laura looks out the window of a train and notes that it takes half a minute between the moment she enters a tunnel to the moment when she exits the tunnel. If the tunnel is a mile long, how fast is the train moving, in miles per minute?
44	What is the least possible product of two numbers from the set $\{-1/4, 2, 3, 0, -3, ½\}$?
45	Quentin can draw a four lions in a minute. Blake can draw three lions in a minute. Between the two of them, how many minutes will it take to draw 42 lions?
46	My bus arrives at my bus stop every hour on the hour, but is sometimes up to five minutes late or early. If I arrive at the bus stop at $3{:}00pm$, what is the difference, in minutes, between the minimum and the maximum amount of time I will have to wait?
47	In box A, there are 5 white puppies and 3 black puppies. In box B, there are 3 white puppies and 2 black puppies. If Michael selects a puppy from each box, what is the probability that he picks one black puppy and one white puppy?
48	Whenever Team Rocket tries to capture Pikachu, Jessie gets electrocuted with probability $5/6$, James gets electrocuted with probability $4/5$, and Ash gets electrocuted half of the time. During tomorrow's attempted abduction, what is the probability that neither Jessie nor James is electrocuted, but Ash is?
49	Amanda has sixty cupcakes. She distributes half of them to her friends, eats two thirds of the remainder, and gives the rest to her sister. How many cupcakes did Amanda's sister get?
50	A container with a square base with side lengths 4cm long is half filled with liquid chocolate. Isabel drops a large strawberry into the container, and the level of chocolate rises by half a centimeter. What is the volume of the strawberry, in cubic centimeters?

