



Knights of Pi Math Tournament – Dec. 12, 2015
Algebra & Operations 7th/8th

1	Evaluate: $2^2 + 2^0 + 2^1 + 2^5$
2	When three numbers are added two at a time, the sums are 43, 23, and 18. What is the sum of all three numbers?
3	If $a \ \$ b = (a + b) / (a - b)$. Find the value of $(3 \ \$ 5) \ \$ (3 / 2)$.
4	It takes Alex 2 hours to mow the golf course. It takes Bill 3 hours, and Carl 6 hours. If Alex, Bill, and Carl all worked together, how long would it take, in hours, for them to mow the golf course?
5	Three consecutive odd integers add up to 309. What is the sum of the digits of the largest integer?
6	Sean is reading <i>How to Get a Girlfriend</i> , a hefty book of 900 pages, from start to finish. Then, a magic fairy comes and adds 8 to every odd page number, and divides every even page number by 2. When Sean gets to the page labeled "133" for the first time, what is the page number of the next page?
7	Solve for x: $2^{x+5} = 4^a / 2^{a+x}$ $8^a / 2^5 = 32^{x+1}$
8	What is the sum of a, b, c, and d? $2a + b + 2c + 3d = 7$ $10a + 6b + 6c + 10d = 24$ $5a + 3b + 4c + 6d = 25$
9	A function $F(x)$ is defined as follows. $F(a+b) = F(a) + F(b) + c$, where a and b are any real integers. If $F(1) = 7$ and $F(0) = -1$, what is $F(5)$?
10	Let $P(x)$ be a polynomial with nonnegative integer coefficients. If $P(1) = 5$ and $P(4) = 83$, then what is $P(3)$?