



Knights of Pi Math Tournament – Mar. 17,  
2018

## Algebra & Operations 7th/8th

1	Evaluate $32 + 42 + 52 + 62 + 72$ .
2	How many factors does 1260 have?
3	Order from the least to the greatest: $25^{100}$ , $7^{200}$ , $3^{300}$ , $4^{200}$ , $2^{600}$ .
4	Simplify $ 4 -  3 + x  $ if $x < -7$ .
5	Solve for $x$ : $\log_9(x^3) = \log_2(8)$ .
6	The first term of a sequence is 2018. Each succeeding term is the sum of the cubes of the digits of the previous term. What is the 2018 <sup>th</sup> term of the sequence?
7	Find all zeros of $y = x^3 + 3x^2 - 13x - 15$ .
8	Find the sum of all prime factors of 1000027.
9	1000 students are arranged in $k$ rows, where $k > 16$ . The number of students in each row are consecutive positive integers. How many students are there in the first row?
10	I have an infinite number of marbles and an infinite number of empty boxes. The empty boxes, each capable of holding 3 marbles, are arranged in a row. At the first step, I place a marble in the first box of the row. At each subsequent step, I place a marble in the first box of the row that still has room for a marble and empty all previous boxes. How many marbles in total are in the boxes as a result of my 2018 <sup>th</sup> step?