

2017-2018 Puzzle Contests

Puzzle Contest #3



Parents and Grandparents Puzzles:

1. The Ancient Book of Christmas Words of Wisdom states:

A traveler lost in a blizzard upon open moorland on a Christmas Eve will safely reach his destination by Christmas if he utters the word "WIND" the smallest number times that is needed to make possible the identity



$$WIND + WIND + \dots + WIND = AAAAAA$$

(a footnote in that book says that the same letters code the same digits, and different letters stand for different digits). What is that useful number? **(35 pts)**

2. It is rumored that the 1,692,306th digit after decimal point of the number $\{\sqrt{2026}\}^{1,000,000}$ will be the character of success in the year of 2026. What is this digit? Explain why.

($\{x\}$ is a fractional part of real number x ; for example: $\{1.999\} = 0.999$)**(40 pts)**

3. In the periodic decimal representation of $\frac{1}{700}$, all digits starting from the 2018th after the decimal point were shifted 1 position to the left, replacing the 2017th digit. All digits to the left of the 2017th after the decimal remained unchanged. Is the new number greater or smaller than $\frac{1}{700}$? Why or why not? **(25 pts)**

Solutions deadline is January 15

Please submit your solutions to anna.charny@metrowestschool.com
or bring them to the office