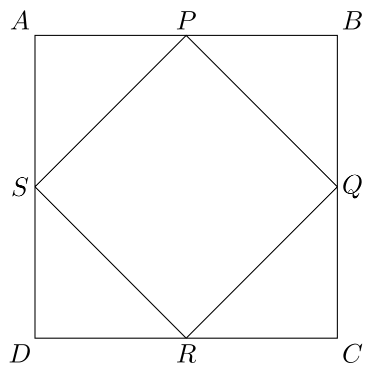
1-1. Each value of Pascal's Triangle is determined by summing the values of the two numbers above it. The first few rows are shown below. Find the sum of the first 8 rows. (For this problem's purposes, the row on the top is considered to be the first row.)

$$\begin{array}{ccccc} & & 1 & & \\ & 1 & & 1 & \\ 1 & & 2 & & 1 \end{array}$$

1-2. Let T be the smallest prime factor of $TNYWR$. $ABCD$ and $PQRS$ are squares such that P lies on $\overline{AB}$, Q lies on $\overline{BC}$, R lies on $\overline{CD}$, S lies on $\overline{AD}$, $AP = T$, and $CD = 7$. Find the area of $PQRS$.



1-3. Let $T = TNYWR$. Find the units digit of $T^1 + T^2 + \cdots + T^{T-1} + T^T$.

1-4. Let $T = TNYWR$. Integers x and y are such that $\frac{1}{x} + \frac{1}{y} = \frac{1}{T}$. Find the smallest possible value of x.

2-1. Suppose $a + \frac{1}{b + \frac{1}{b + \cdots}} = \sqrt{10}$. Find $b - a$ if a and b are positive integers.

2-2. Let $T = TNYWR$. Two lines on the coordinate plane of slope T and $\frac{1}{T}$ intersect at (T, T). Find the area of the triangle enclosed by the two lines and the x-axis.

2-3. Let $T = TNYWR$. How many different ways are there to obtain a sum of $\frac{2T}{3}$ by rolling $\frac{T}{3}$ distinct regular dice?

2-4. Let $T = TNYWR$. How many distinct ways are there to color the sides of a T-sided polygon with 3 colors if no two adjacent sides can have the same color? (A coloring that can be obtained by rotating or reflecting another coloring is not distinct.)