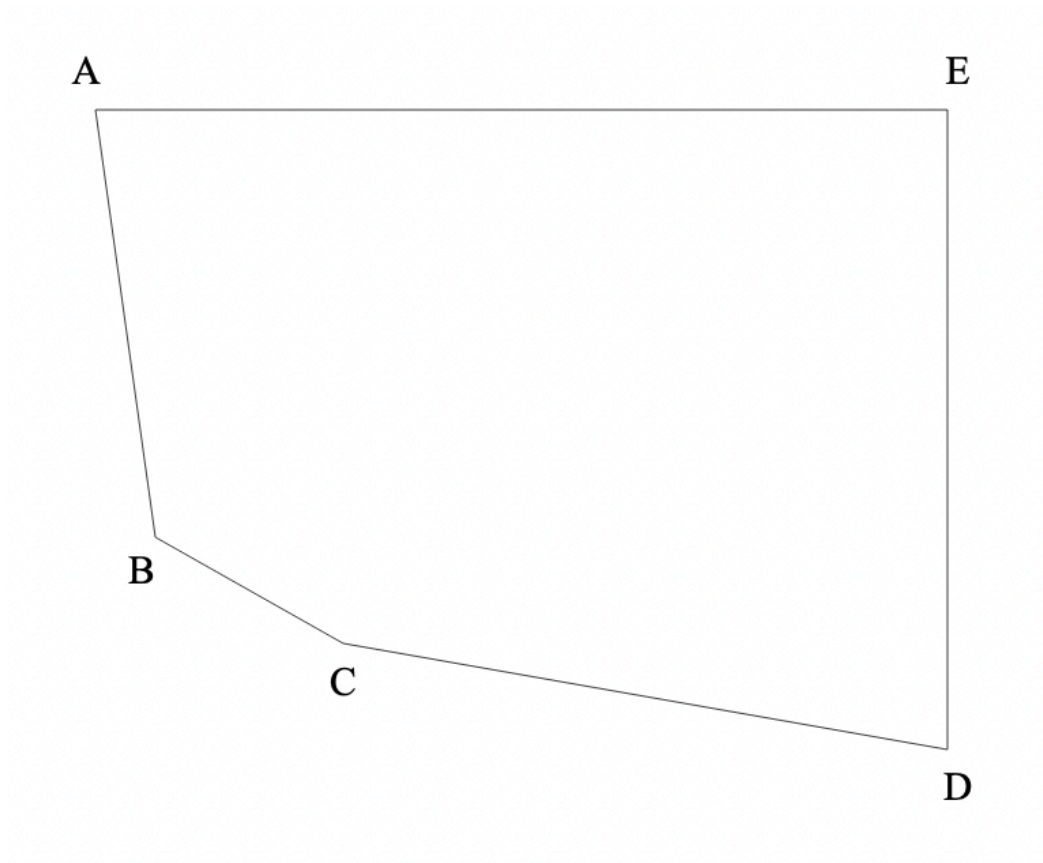
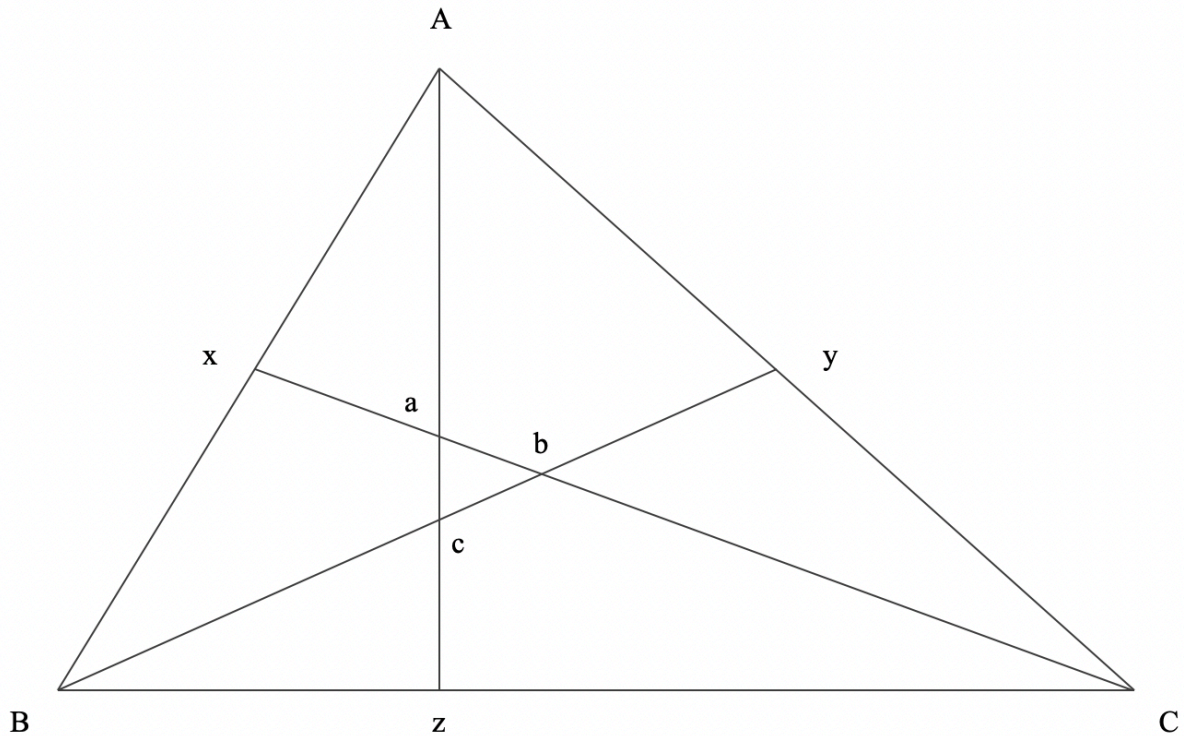


1. Let $K(x)$ be a function defined on $x > 0$ such that $K(10x) = K(x) + 1$ and $K(x) = 0$ when $x < 1$.
Evaluate $K(3^{2022})$.
2. Alex tosses two fair 6-sided dice simultaneously. If the numbers on both are equal, he tosses both dice again. He repeats this process until the two numbers are not equal, at which point he wins if the dice with the larger number has a number greater than 3, and loses otherwise. What is his likelihood of winning?
3. In pentagon $ABCDE$, $AE = 5$, $ED = 3$, $AB : BC : CD = 7 : 3 : 11$, $\angle AED$ is a right angle.
Assuming $\angle BAE = \angle CDE$, solve for the perimeter of $ABCDE$.



4. Given $AB = 4$, $AC = 5$, $BC = 6$, By , Cx are the angle bisectors of $\angle B$ and $\angle C$, respectively and Az is perpendicular to segment BC , if $AB = 4$, $AC = 5$, $BC = 6$, solve for the area of $\triangle abc$.



5. Assuming $f : \mathbb{W} \rightarrow \mathbb{W}$ satisfies $f(xy) = f(x + y)$, evaluate the sum of all distinct values of $f(2022) - f(2021)f(2020) + f(2021) - f(2020)f(2019) + \cdots + f(2) - f(1)f(0) \pmod{6}$.
6. How many elements can $S \subset \{0, 1, 2, \dots, 2021, 2022\}$ at most have such that no three elements of S have a sum which is a multiple of 10?