Time limit: 15 minutes.

Instructions: This tiebreaker contains 5 short answer questions. All answers are positive integers. You will submit answers to the problem as you solve them, and may solve problems in any order. You will not be informed whether your answer is correct until the end of the tiebreaker. You may submit multiple times for any of the problems, but **only the last submission for a given problem will be graded**. The participant who correctly answers the most problems wins the tiebreaker, with ties broken by the time of the last correct submission.

No calculators.

1. An *exterior angle* is the supplementary angle to an interior angle in a polygon. What is the sum of the exterior angles of a triangle and dodecagon (12-gon), in degrees?

2. Let $\eta \in [0, 1]$ be a relative measure of material absorbence. η values for materials combined together are additive. η for a napkin is 10 times that of a sheet of paper, and a cardboard roll has $\eta = 0.75$. Justin can create a makeshift cup with $\eta = 1$ using 50 napkins and nothing else. How many sheets of paper would he need to add to a cardboard roll to create a makeshift cup with $\eta = 1$?

3. $\triangle ABC$ has $AB = 5$, $BC = 12$, and $AC = 13$. A circle is inscribed in $\triangle ABC$, and $\overline{MN}$ tangent to the circle is drawn such that M is on $\overline{AC}$, N is on $\overline{BC}$, and $\overline{MN} \parallel \overline{AB}$. The area of $\triangle MNC$ is $\frac{m}{n}$, where m and n are relatively prime positive integers. Find $m + n$.

4. In an 6×6 grid of lattice points, how many ways are there to choose 4 points that are vertices of a nondegenerate quadrilateral with at least one pair of opposite sides parallel to the sides of the grid?

5. The polynomial $f(x) = x^3 + rx^2 + sx + t$ has r, s, and t as its roots (with multiplicity), where $f(1)$ is rational and $t \neq 0$. Compute $|f(0)|$.