# CCA Math Bonanza

March 8, 2025

Division II Tiebreaker Round

TB1) Find the number of factors of 2025 that are multiples of 5 but not 27.

TB2) Shown below are 100 quarter circles of radii $1, 2, 3, ..., 100$, all of which share the same center and are oriented in the same direction. These circles divide the figure into 100 rings. The first ring is colored white, and subsequent rings alternate between grey and white. The area of the grey region can be expressed as $\frac{m}{n}\pi$, where m and n are relatively prime positive integers. Find $100m + n$.
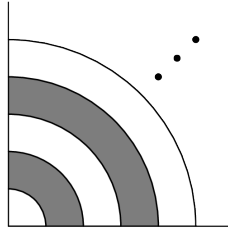
TB3) Let n and x be positive integers such that the sum of the digits of x is 2 and

$$9900\,9900\,9900\,9901 \times n = x.$$

Find the smallest such n.

TB4) Charlotte the cat lives in Cartesia, a city on the coordinate plane whose roads are the lines $x = a$ and $y = a$ for integers a. Charlotte is currently standing at the origin, and would like to walk to the highway at $y = 5$, and then to her home at $(6, 1)$. Let D be the length of the shortest possible path she could take home. Find the distinct number of paths of length D Charlotte can take.