Time limit: 15 minutes.
Instructions: This tiebreaker contains 5 short answer questions. 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. For all a and b, let $a \clubsuit b = 3a + 2b + 1$. Compute c such that $(2c) \clubsuit (5 \clubsuit (c + 3)) = 60$.

2. Call a positive whole number *rickety* if it is three times the product of its digits. There are two 2-digit numbers that are rickety. What is their sum?

3. You wish to color every vertex, edge, face, and the interior of a cube one color each such that no two adjacent objects are the same color. Faces are adjacent if they share an edge. Edges are adjacent if they share a vertex. The interior is adjacent to all of its faces, edges, and vertices. Each face is adjacent to all of its edges and vertices, but is not adjacent to any other edges or vertices. Each edge is adjacent to both of its vertices, but is not adjacent to any other vertices. What is the minimum number of colors required for a coloring satisfying this property?

4. How many positive integers less than 2022 contain at least one digit less than 5 and also at least one digit greater than 4?

5. In triangle $\triangle ABC$, M is the midpoint of $\overline{AB}$ and N is the midpoint of $\overline{AC}$. Let P be the midpoint of $\overline{BN}$ and let Q be the midpoint of $\overline{CM}$. If $AM = 6$, $BC = 8$ and $BN = 7$, compute the perimeter of triangle $\triangle NPQ$.