Time limit: 15 minutes.
Instructions: This tiebreaker contains 3 short answer questions. All answers must be expressed in simplest form unless specified otherwise. 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. George is drawing a Christmas tree; he starts with an isosceles triangle AB_0C_0 with $AB_0 = AC_0 = 41$ and $B_0C_0 = 18$. Then, he draws points B_i and C_i on sides AB_0 and AC_0, respectively, such that $B_iB_{i+1} = 1$ and $C_iC_{i+1} = 1$ ($B_{41} = C_{41} = A$). Finally, he uses a green crayon to color in triangles $B_iC_iC_{i+1}$ for i from 0 to 40. What is the total area that he colors in?

2. The incircle of $\triangle ABC$ is centered at I and is tangent to BC, CA, and AB at D, E, and F, respectively. A circle with radius 2 is centered at each of D, E, and F. Circle D intersects circle I at points D_1 and D_2. The points E_1, E_2, F_1, and F_2 are defined similarly. If the inradius of $\triangle ABC$ is 5, what is the ratio of the area of the triangle whose sides are formed by extending D_1D_2, E_1E_2, and F_1F_2 to the area of $\triangle ABC$?

3. Let $\triangle ABC$ be a triangle with $BA < AC$, $BC = 10$, and $BA = 8$. Let H be the orthocenter of $\triangle ABC$. Let F be the point on segment AC such that $BF = 8$. Let T be the point of intersection of FH and the extension of line BC. Suppose that $BT = 8$. Find the area of $\triangle ABC$.