

Time limit: 15 minutes.

Instructions: This tiebreaker contains 3 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. Suppose that $(i - 1)^{11}$ is a root of the quadratic $x^2 + Ax + B$ for integers A and B , where $i = \sqrt{-1}$. Compute the value of $A + B$.
3. Tej writes $2, 3, \dots, 101$ on a chalkboard. Every minute he erases two numbers from the board, x and y , and writes $xy/(x + y - 1)$. If Tej does this for 99 minutes until only one number remains, what is its maximum possible value?