

Practice Test 2

Choose any 3 of the following problems :

1. Six integer numbers, $a_1, a_2, a_3, a_4, a_5,$ and a_6 are chosen randomly. Prove that $\prod_{1 \leq i < j \leq 6} (a_i - a_j)$ is divisible by 10.
2. Solve for x : $|x + 1| + 5 - x^2 \geq 0$
3. Let $F_0 = 0, F_1 = 1, F_2 = 1, \dots, F_{99}$ be the first 100 Fibonacci numbers (recall that $F_n = F_{n-1} + F_{n-2}$ for $n \geq 2$). How many of them are even?
4. A circle is divided into six sectors. Then the numbers 1, 0, 1, 0, 1, 0 are written into the sectors as shown below. We may increase any two neighboring numbers by 1. We may repeat this step as many times as we want. Is it possible to equalize all the numbers?

