Language: Kinyarwanda

Day: 2

Ku Cyumweru, 12 Mata, 2026

Ikibazo cya 4. Reka $1 = a_1 \geq a_2 \geq a_3 \geq \cdots$ ibe uruhererekane (sequence) rw'imibare ya real numbers rutarangira, ku buryo $a_n = a_{2n} + a_{2n+1}$ kuri buri positive integer n. Niba $r = 2026^{2026}$, erekana ko:

$$\frac{1}{r} \leq a_r \leq \frac{2}{r+1}.$$

Ikibazo cya 5. Reka ABC ibe acute triangle aho $AC > AB$. Reka ω ibe circumcircle na O ibe circumcenter byayo. Tangents za ω ku tudomo B na C zihurire ku kadomo K. Circle ABK ihurira n'umurongo BC kuri $Z \neq B$. Nanone, reka L ibe midpoint y'umurongo KZ. Reka X ibe ihuriro ry'imirongo KZ na AB. Reka V ibe akadomo kuri circle ABL ku ruhande rumwe rwa BC na A, ku buryo OV iba perpendicular kuri KZ. Erekana ko LV iri perpendicular kuri CX.

Ikibazo cya 6. Reka p ibe prime number na n ibe positive integer ku buryo p **itagabanya** n. Reka k ibe umubare wa positive divisors za n, aho $1 = d_1 < d_2 < \cdots < d_k = n$ ari positive divisors za n. Kuri buri mubare $i = 1, 2, \ldots, k$, reka c_i ibe umubare wa positive divisors ℓ za d_i^2, ku buryo $d_i - \ell$ bigabanya p. Erekana ko

$$(p-1)\,(c_1 + c_2 + \cdots + c_k) \geq k^2.$$