an integral multiple of the smallest subscript in the set. For example, $\{a_2, a_6, a_8\}$ is an acceptable set, as is $\{a_6\}$. How many such sets can be formed?

INDIVIDUAL QUESTIONS

I1. Compute n if $(10^{12} + 25)^2 - (10^{12} - 25)^2 = 10^n$.

I2. If $0° < x < 90°$ and $\cos x = \dfrac{3}{\sqrt{10}}$, compute $\log \sin x + \log \cos x + \log \tan x$.

I3. The integers x, y, and z are each perfect squares, and $x > y > z > 0$. If x, y, and z form an arithmetic progression, compute the smallest possible value of x.

I4. In triangle ABC, altitude $\overline{AH}$ and median $\overline{BM}$ intersect inside the triangle and are equal. If $\measuredangle ACB = 41°$, find the measure of $\measuredangle MBC$.

I5. There are exactly four positive integers n such that $\dfrac{(n+1)^2}{n+23}$ is an integer. Compute the largest such n.

I6. In triangle ABC, P and Q are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively; R and S are the trisection points of $\overline{BC}$ (with R closer to B). $\overline{PS}$ and $\overline{QR}$ intersect in T. If the area of triangle ABC is 60, compute the area of triangle PQT.

RELAY 1

R1-1. In the diagram, O is the center of the circle, $\overline{CE} \cong \overline{ED}$ in triangle CED, and $\measuredangle AOB$ is a right angle, as shown. If the ratio of the area of $\triangle CED$ to the area of $\triangle AOB$ is $k:1$, compute k.