

Tiebreaker, Division A**Division A, 15 Minutes, Individual**

1. Compute

$$\left\lfloor 100 \sum_{n=0}^{\infty} \arctan \left(\frac{1}{n^2 + n + 1} \right) \right\rfloor.$$

Answer: 157 (*Proposed by: Neil Dixit*)

2. Find the number of possible integer values of

$$2025 \left(\frac{\text{lcm}(x, y)}{x + y} \right).$$

Answer: 1012 (*Proposed by: Alex Tsagaan*)

3. Let triangle
- ABC
- with
- $\angle BAC \geq 120^\circ$
- be inscribed in a circle with radius 34 and center
- O
- . Let
- E
- be the intersection between
- (ABC)
- and the altitude from
- A
- onto
- BC
- , and let
- F
- be the point on
- (ABC)
- such that
- EF
- is parallel to
- BC
- . Given that
- AOC
- is equilateral and
- $\cos(\angle BCF) = \frac{8}{17}$
- , the area of triangle
- BEF
- can be expressed as
- $a\sqrt{b} - c$
- , where
- a, b
- , and
- c
- are positive integers and
- b
- is square-free. Find
- $a + b + c$
- .

Answer: 1173 (*Proposed by: Alex Tsagaan*)