1. (AoPS) For any triangle with angles A, B, C, prove that

$$\sin A + \sin B + \sin C \leq \frac{3\sqrt{3}}{2}.$$

2. Prove the "AM-GM inequality", that the arithmetic mean of non-negative real numbers $x_1, x_2, \cdots, x_n$ is always greater than or equal to their geometric mean. That is

$$\frac{x_1 + x_2 + \cdots + x_n}{n} \geq \sqrt[n]{x_1 \cdot x_2 \cdots x_n}.$$