**3938**. *Proposé par Francisco Javier García Capitán.*

Soit un triangle $ABC$ et un cercle $O$. Déterminer un point $P$ sur $O$ pour lequel l'expression $PA^2 + PB^2 + PC^2$ a une valeur minimale et un autre point $P$ sur $O$ pour lequel l'expression a une valeur maximale.

**3939**. *Proposé par George Apostolopolous.*

Soit $a, b$ et $c$ des réels strictement positifs tels que $a^2 + b^2 + c^2 = 27$. Démontrer que

$$\sum_{\text{cycl}} \frac{a}{\sqrt{a^2 - 3a + 9}} \leq 3.$$

**3940**. *Proposé par Michał Kremzer.*

Déterminer des réels strictement positifs $a$ et $b$ tels que $\dfrac{a+b}{a(\tan a + \tan b)} = 2015.$

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**3931**. *Proposed by Bill Sands.*

A class is given two math tests. Each student in the class must write either Test 1 or Test 2 , but could write both tests. It turned out that one-quarter of the students who wrote Test 1 got an A, that one-third of the students who wrote Test 2 got an A, and that the same number of students got A on the two tests. Also, one-half of all the students in the class got an A on at least one of the two tests. Prove that

a) every student wrote Test 1, and

b) no student got A on both tests.

**3932**. *Proposed by Arkady Alt.*

Let $x$ and $y$ be natural numbers satisfying equation $x^2 - 14xy + y^2 - 4x = 0$. Find $\gcd(x, y)$ in terms of $x$ and $y$.

**3933**. *Proposed by Dragoljub Milošević.*

Let $ABCDEFG$ be a regular heptagon. Prove that

$$\frac{AD^3}{AB^3} - \frac{AB + 2AC}{AD - AC} = 1.$$

**3934**. *Proposed by George Apostolopolous.*

Let $a, b$ and $c$ be the side lengths of a triangle. Prove that

$$\frac{a}{\sqrt[3]{4b^3 + 4c^3}} + \frac{b}{\sqrt[3]{4a^3 + 4c^3}} + \frac{c}{\sqrt[3]{4a^3 + 4b^3}} < 2.$$