

ROMANIAN MATHEMATICAL MAGAZINE

If $a, b > 0$, $\frac{4}{a^2} + \frac{1}{b^2} = \frac{5}{4}$ then:

$$4a + b \geq 10$$

Proposed by Nguyen Hung Cuong-Vietnam

Solution by Tapas Das-India

$$\frac{5}{4} = \frac{4}{a^2} + \frac{1}{b^2} = \frac{64}{16a^2} + \frac{1}{b^2} = \frac{4^3}{(4a)^2} + \frac{(1)^3}{b^2} \stackrel{RADON}{\geq} \frac{(4+1)^3}{(4a+b)^2} = \frac{5^3}{(4a+b)^2}$$

$$\frac{5}{4} \geq \frac{5^3}{(4a+b)^2}$$

$$(4a+b)^2 \geq 100$$

$$4a+b \geq 10$$

Equality holds for $a = b = 2$.