ROMANIAN MATHEMATICAL MAGAZINE

If $a, b > 0$ then:

$$\sqrt{a^2+\frac{1}{b^2}}+\sqrt{b^2+\frac{1}{a^2}} \geq 2\sqrt{2}$$

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Solution by Tapas Das-India

$$\sqrt{a^2+\frac{1}{b^2}}+\sqrt{b^2+\frac{1}{a^2}} \geq$$

$$\overset{AM-GM}{\geq} \sqrt{\frac{2a}{b}}+\sqrt{\frac{2b}{a}} \overset{AM-GM}{\geq} 2\sqrt{\sqrt{\left(\frac{2a}{b}\right)\cdot\left(\frac{2b}{a}\right)}} = 2\sqrt{2}$$

Equality holds for $a = b$.