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Prove that sum of the legs of a right triangle never exceeds $\sqrt{2}$ times the hypotenuse.

The problem was solved by

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Discussion.
Let $\theta$ be the angle between the hypotenuse and the side adjacent to the hypotenuse. If the length of hypotenuse is $l$, the length of the adjacent side is $b$ and the length of the opposite side is $a$, then

$$a + b = l(\sin(\theta) + \cos(\theta))$$

Therefore

$$a + b = l\sqrt{2}\sin(\theta + \pi/4)$$

Since $\sin(\theta + \pi/4) \leq 1$, the desired result follows.