Answer on Question #68512 Math / Trigonometry

sec alpha = 5/4, find value of tan alpha/1 + tan square alpha

Solution:

$$\sec \alpha = \frac{5}{4}$$

$$\cos \alpha = \frac{1}{\sec \alpha} = \frac{4}{5}, \sin \alpha = \sqrt{1 - \cos^2 \alpha} = \sqrt{1 - \left(\frac{4}{5}\right)^2} = \frac{3}{5}.$$

$$\tan \alpha = \frac{\sin \alpha}{\cos \alpha} = \frac{3}{4}$$

So

$$\frac{\tan \alpha}{1 + \tan^2 \alpha} = \frac{\frac{3}{4}}{1 + \left(\frac{3}{4}\right)^2} = \frac{12}{25} = 0.48$$

Answer: $\frac{12}{25} = 0.48$

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