Answer on Question #42095 – Math - Trigonometry

If tan (x)+cot(x)=2 then tan 2(x)+cot 2 (x)=?

Solution:

We have

$$\tan(x) + \cot(x) = 2 \qquad (1)$$

Square both sides of equation:

$$(\tan(x) + \cot(x))^2 = 4$$

$$\tan^2(x) + 2\tan(x) \cdot \cot(x) + \cot^2(x) = 4$$

$$\tan^2(x) + \cot^2(x) = 4 - 2\tan(x) \cdot \cot(x) \qquad (2)$$

Formula for the tangent:

$$\tan(x) = \frac{1}{\cot(x)} \qquad (3)$$

Take into account (3) and rewrite (2):

$$\tan^2(x) + \cot^2(x) = 4 - 2\tan(x) \cdot \frac{1}{\tan(x)} = 4 - 2 = 2$$

Answer: $\tan^2(x) + \cot^2(x) = 2$