Answer on Question #42095 – Math - Trigonometry

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

Solution:

We have

$$tan(x) + cot(x) = 2$$
Square both sides of equation:

$$(tan(x) + cot(x))^{2} = 4$$

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

$$tan^{2}(x) + cot^{2}(x) = 4 - 2 tan(x) \cdot cot(x)$$
Formula for the tangent:

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

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: $tan^{2}(x) + cot^{2}(x) = 2$

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