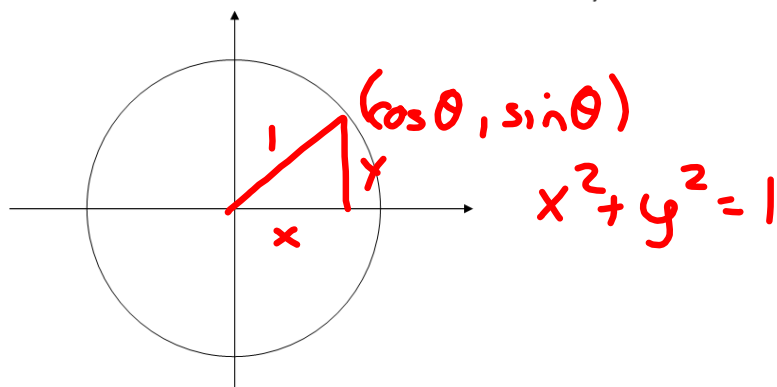


Please change question 2 on
Worksheet 7.2

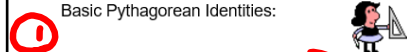
$$\tan x(\cos x - \csc x)$$

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Pythagorean Identities

PreCalc
Unit 7 Day 5

Basic Pythagorean Identities:



$$\begin{aligned} \textcircled{1} \sin^2 \theta + \cos^2 \theta &= 1 \xrightarrow{\textcircled{4}} \sin^2 \theta = 1 - \cos^2 \theta \\ &\xrightarrow{\textcircled{2}} \cos^2 \theta = 1 - \sin^2 \theta \\ \textcircled{2} 1 + \cot^2 \theta &= \csc^2 \theta (\div \sin^2 \theta) \xrightarrow{\textcircled{6}} \cot^2 \theta = \csc^2 \theta - 1 \\ \textcircled{3} \tan^2 \theta + 1 &= \sec^2 \theta (\div \cos^2 \theta) \xrightarrow{\textcircled{7}} \tan^2 \theta = \sec^2 \theta - 1 \end{aligned}$$

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Factor and simplify, if possible:

1. $\sec^2 \theta - \csc^2 \theta$ DOTS

2. $\tan x + \tan^3 x$

$$: (\sec \theta + \csc \theta)(\sec \theta - \csc \theta)$$

3. $\cos^3 x - 8$ Diff of Cubes

a: $\cos x$ b: 2

4. $\sin^4 x - \cos^4 x$ Double DOTS

$$: (\cos x - 2)(\cos^2 x + 2\cos x + 4)$$

$$: (\sin^2 x + \cos^2 x)(\sin^2 x - \cos^2 x)$$

$$= (\sin x - \cos x)(\sin x + \cos x)$$

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Multiply and Simplify: (Substitution)

5. $(\sin \alpha - \cos \alpha)^2$

6. $(1 - \cos \theta)(1 + \cos \theta)$

$$: (\sin \alpha - \cos \alpha)(\sin \alpha - \cos \alpha)$$

$$: 1 - \cos^2 \theta = \sin^2 \theta$$

$$: \sin^2 \alpha - \sin \alpha \cos \alpha - \sin \alpha \cos \alpha + \cos^2 \alpha$$

$$: 1 - 2 \sin \alpha \cos \alpha$$

7. $\csc x (\cos x - \sin x)$

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Simplify.

8. $\sin^2 x + \sin^2 x \tan^2 x$

9. $\frac{1}{\sin^2 \theta} - \frac{\cos^2 \theta}{\sin^2 \theta}$

10. $\sin \theta + \cot \theta \cos \theta$

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