

Tips for verifying trig identities or simplifying trig expressions

1. Convert to sine and cosine
2. Look for Pythagorean identities
3. Get common denominators
4. Factor
5. Try something!

5-1 / 5-2 Verifying Trig Identities

Ex 1 Verify: $(\tan^2 x + 1)(\cos^2 x - 1) = -\tan^2 x$

$$\begin{aligned} & (\sec^2 x)(\cos^2 x - 1) = \\ & \left(\frac{1}{\cos^2 x}\right)(\cos^2 x - 1) = \\ & \left(\frac{1}{\cos^2 x}\right)\left(\frac{-\sin^2 x}{1}\right) = \\ & \frac{-\sin^2 x}{\cos^2 x} = -\tan^2 x \end{aligned}$$

Ex 2 Verify: $\sec y + \tan y = \frac{\cos y}{1 - \sin y}$

$$\frac{1}{\cos y} + \frac{\sin y}{\cos y} =$$

$$\frac{(1 + \sin y)}{\cos y} = \frac{\cos y}{(1 - \sin y)}$$

$$\cos^2 y = 1 - \sin^2 y$$

$$\sin^2 y + \cos^2 y = 1$$

Ex 3 Verify: $\csc x - \sin x = \cos x \cot x$

$$\frac{1}{\sin x} - \frac{\sin x}{1 \sin x} = \frac{\cos x}{1} \cdot \frac{\cos x}{\sin x}$$

$$\frac{1 - \sin^2 x}{\sin x} = \frac{\cos^2 x}{\sin x}$$

$$\frac{\cos^2 x}{\sin x} = \frac{\cos^2 x}{\sin x}$$

Ex 4 Verify: $\csc \alpha + \cot \alpha = \frac{\sin \alpha}{1 - \cos \alpha}$

$$\frac{1}{\sin x} + \frac{\cos x}{\sin x} =$$

$$\frac{1 + \cos x}{\sin x} = \frac{\sin x}{1 - \cos x}$$

$$\sin^2 x = 1 - \cos^2 x$$

$$\sin^2 x + \cos^2 x = 1$$

Homework
p.357 #1-7 all
#27-37, 51-67 odds
p.365 #1-10 all