

Section 7.3: Proving Trig Identities

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12:01 PM

proving trig identities:

goal: show that

messy expression #1 = messy expression #2

method ①:

mess around with one side of the equation until you get the ^{same} expression on the other side

method ②:

mess around with both sides until you show that both sides equal expression #3

note:

Since you are trying to prove that both sides are equal to each other, you are not allowed to assume that they are equal:

the "=" sign is really a "≐"

∴ we cannot use the properties of equality

⇒ we cannot add the same thing to both sides

⇒ we cannot multiply both sides by the same thing

example: show that:

$$\frac{1 + \cos \theta}{\sin \theta} + \tan \theta \stackrel{?}{=} \frac{\cos \theta + 1}{\sin \theta \cos \theta}$$

$$\left(\frac{\cos \theta}{\cos \theta} \right) \frac{1 + \cos \theta}{\sin \theta} + \frac{\sin \theta}{\cos \theta} \left(\frac{\sin \theta}{\sin \theta} \right)$$

$$\frac{\cos \theta + \cos^2 \theta + \sin^2 \theta}{\sin \theta \cos \theta}$$

$$\frac{\cos \theta + 1}{\sin \theta \cos \theta}$$

QED ✓