

5.2 Proving Trig Identities

- ① The goal is to prove 2 expressions equivalent.
- ② Start with the more complicated side and rework until I get stuck. Then, if necessary, I rework the other side.

(A) $\cos^3 x \stackrel{?}{=} (1 - \sin^2 x)(\cos x)$

$\cos^2 x (\cos x)$

$\cos^3 x \checkmark$

(B) $\tan x + \cot x = \sec x \cdot \csc x$

$\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} \cdot \frac{\cos x}{\cos x}$

$\frac{\sin^2 x + \cos^2 x}{\cos x \cdot \sin x}$

$\frac{1}{\cos x \cdot \sin x} \checkmark$

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

$\frac{1}{\cos x \cdot \sin x} \checkmark$

(C) $\cos x (\tan x + \sin x \cdot \cot x) = \sin x + \cos^2 x$

$\cos x \left(\frac{\sin x}{\cos x} + \sin x \cdot \frac{\cos x}{\sin x} \right)$

$\cos x \left(\frac{\sin x}{\cancel{\cos x}} + \cos x \right)$

$$\cancel{\cos x} \left(\frac{\sin x}{\cancel{\cos x}} + \cos x \right)$$

$$\boxed{\sin x + \cos^2 x} \star$$

or

$$\cancel{\cos x} \left(\frac{\sin x + \cos^2 x}{\cancel{\cos x}} \right)$$