

MATH 119: Quiz 6

Name: Key

Directions:

- * Show your thought process (commonly said as "show your work") when solving each problem for full credit.
- * If you do not know how to solve a problem, try your best and/or explain in English what you would do.
- * Good luck!

1. Simplify these trigonometric expressions:

(a) $\cos^3 x + \sin^2 x \cos x$

GCF
 $= \cos(x) (\cos^2(x) + \sin^2(x))$

$= \cos(x) \cdot 1$

$= \boxed{\cos(x)}$

(b) $\frac{\sin x \sec x}{\tan x}$

5.2
 identities $= \frac{\sin(x) \cdot \frac{1}{\cos(x)}}{\frac{\sin(x)}{\cos(x)}} \stackrel{\text{frac law}}{=} \frac{\frac{\sin(x)}{\cos(x)}}{\frac{\sin(x)}{\cos(x)}} = \frac{\sin(x)}{\cos(x)} \cdot \frac{\cos(x)}{\sin(x)}$

frac
 $\stackrel{\text{#1}}{=} \frac{\cancel{\sin(x)} \cancel{\cos(x)}}{\cancel{\cos(x)} \cancel{\sin(x)}}$

frac
 $\stackrel{\text{#5}}{=} \boxed{1}$

2. Prove this identity:

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

$$\text{LHS} = (\overset{(A}{\sin(x)} + \overset{B}{\cos(x)})^2$$

$$= \sin^2(x) + 2 \sin(x) \cos(x) + \cos^2(x)$$

$$= \underbrace{\sin^2(x) + \cos^2(x)}_{= 1} + 2 \sin(x) \cos(x)$$

$$\overset{5.2}{\text{identity}} = 1 + 2 \sin(x) \cos(x)$$

$$= \text{RHS} \quad \square$$