

Math 104 Practice Test 3

1. Establish the identity:

a. $\csc x - \cot x = \frac{\sin x}{1 + \cos x}$

b. $\sec x - \cos x = \sin x \tan x$

c. $\frac{1 - 2\cos^2 x}{\sin x \cos x} = \tan x - \cot x$

d. $\sec(A + B) = \frac{\csc A \csc B}{\cot A \cot B - 1}$

e. $\sin^2 x \cos^2 x = \frac{1}{8} [1 - \cos(4x)]$

2. Find the exact value:

a. $\cos \frac{5\pi}{12} \cos \frac{7\pi}{12} - \sin \frac{5\pi}{12} \sin \frac{7\pi}{12}$

b. $\sin \frac{\pi}{12}$

c. $\sec \frac{15\pi}{8}$

d. $\sin \left[2 \sin^{-1} \frac{\sqrt{3}}{2} \right]$

3. Find the exact value of $\sin(A + B)$ if $\tan A = \frac{5}{12}$, $\pi < A < 3\pi/2$, $\sin B = -\frac{1}{2}$, $\pi < B < 3\pi/2$.

4. Express as a sum containing only sines or only cosines:

$$\cos(3x) \cos(4x)$$

5. Solve for x:

a. $\cos x + 1 = 0, 0 \leq x \leq 2\pi$

b. $\sin(2x) = -1$

c. $\tan x = 2 \sin x$

d. $3 - \sin x = \cos(2x)$