

Review Questions for Sections 5.1,5.2

For the following, show all work on a separate piece of paper.

Part I: Simplify the following trig expressions.

- 1) $\sin x \sec x$
- 2) $\sin^2 x (\cot^2 x + 1)$
- 3) $\frac{\csc x}{\cot x}$
- 4) $1 - \frac{\sin^2 x}{1 - \cos x}$
- 5) $\sec^2 x + \csc^2 x$

Part II: Prove the following trig identities

- 6) $\csc x - \cos x \cot x = \sin x$
- 7) $\frac{\sec x + \tan x}{\csc x + 1} = \tan x$
- 8) $\tan^2 x - \sin^2 x = \sin^2 x \tan^2 x$
- 9) $\frac{\sin x}{1 + \cos x} = \frac{1 - \cos x}{\sin x}$

Part III: Solve the following trig equations over $[0, 2\pi)$

- 10) $\tan x + \sqrt{3} = 0$
- 11) $2 \sin x \cos x = \sqrt{2} \cos x$
- 12) $4 \sin^2 x = 3$
- 13) $\tan x \sec x = \tan x$
- 14) $2 \sec^2 x - 3 \sec x - 2 = 0$
- 15) $\tan^2 x - \sec x - 1 = 0$