

1/1PC Final Exam Study Guide

Sec 5.1 Review

Get common Denom.

$$1. \frac{1}{\cot^2 \theta} + \sec \theta \cos \theta = \frac{1}{\cot^2 \theta} + \frac{1}{\cos \theta} \cdot \frac{\cos \theta}{1} = \frac{1}{\cot^2 \theta} + 1 = \frac{1}{\cot^2 \theta} + \frac{\cot^2 \theta}{\cot^2 \theta}$$

$$\rightarrow \frac{1 + \cot^2 \theta}{\cot^2 \theta} = \frac{\csc^2 \theta}{\cot^2 \theta} = \frac{\frac{1}{\sin^2 \theta}}{\frac{\cos \theta}{\sin \theta}} = \frac{1}{\sin^2 \theta} \cdot \frac{\sin^2 \theta}{\cos^2 \theta} = \frac{1}{\cos^2 \theta} = \sec^2 \theta$$

$$2. \frac{\tan \theta}{\sec \theta} = \frac{\frac{\sin \theta}{\cos \theta}}{\frac{1}{\cos \theta}} = \frac{\sin \theta}{\cos \theta} \cdot \frac{\cos \theta}{1} = \sin \theta$$

$$3. \sin \theta \cos \theta \sec \theta \csc \theta = \sin \theta \cdot \cos \theta \cdot \frac{1}{\cos \theta} \cdot \frac{1}{\sin \theta} = 1$$

$$4. \cot(-x) \tan(x) = \overset{(\text{odd})}{-\cot(x)} \tan(x) = -\frac{1}{\tan x} \cdot \tan x = -1$$

$$5. \csc\left(\frac{\pi}{2} - x\right) \cos(-x) = \overset{(\text{cofcn})}{\sec(x)} \overset{(\text{even})}{\cos(x)} = \frac{1}{\cos x} \cdot \cos x = 1$$

$$6. \csc(-x) \sin(-x) = -1 \csc(x) \cdot -1 \sin(x) = \frac{1}{\sin x} \cdot \sin x = 1$$

$$7. \cos(\theta - \pi/2) = -4/5 \text{ find } \sin \theta \text{ \& } 1 + \tan^2 \theta = \sec^2 \theta \text{ QIV}$$

$$\cos(-1(\pi/2 - \theta)) = -4/5$$

$$\overset{(\text{since even})}{\cos(\pi/2 - \theta)} = -4/5$$

$$\overset{(\text{cofcn})}{\sin \theta} = -4/5$$

$$9. 1 + \cot^2 \theta = \csc^2 \theta \text{ QI}$$

$$\cot^2 \theta = \csc^2 \theta - 1$$

$$\cot \theta = \sqrt{\csc^2 \theta - 1}$$

$$\cot \theta = \sqrt{(\sqrt{17}/4)^2 - 1}$$

$$\cot \theta = \sqrt{\frac{17}{16} - \frac{16}{16}} = \sqrt{\frac{1}{16}} = \frac{1}{4}$$

~~17/16~~
~~1/4~~

$$\sec \theta = \sqrt{1 + \tan^2 \theta}$$

$$\sec \theta = \sqrt{1 + (-4/5)^2}$$

$$\sec \theta = \sqrt{1 + 16/25}$$

$$\sec \theta = \sqrt{21/25}$$

$$\sec \theta = 13/5$$

$$\cos \theta = 5/13$$

$$\text{QIV } \sec \theta = 13/5$$

$$10. 1 + \tan^2 \theta = \sec^2 \theta$$

$$\tan^2 \theta = \sec^2 \theta - 1$$

$$\tan \theta = \sqrt{\sec^2 \theta - 1}$$

$$\tan \theta = \sqrt{2^2 - 1}$$

$$\tan \theta = \sqrt{4 - 1} = \sqrt{3}$$

$$\tan \theta = -\sqrt{3}$$

$$\tan \text{ is neg in QIV}$$