

Identities from yesterday:  $\cos^2\theta + \sin^2\theta = 1$  which leads to two more.....

$$\cos\theta = \pm\sqrt{1 - \sin^2\theta} \quad \text{and} \quad \sin\theta = \pm\sqrt{1 - \cos^2\theta}$$

We also discussed the reciprocal identities.

$$1 + \tan^2\theta = \sec^2\theta, \text{ and } 1 + \cot^2\theta = \csc^2\theta$$

Another very important identity!!!  $\tan\theta = \frac{\sin\theta}{\cos\theta}$  which leads to  $\cot\theta = \frac{\cos\theta}{\sin\theta}$ .

Extension of 1-4

Examples: 1. Write  $\tan\theta$  in terms of  $\sin\theta$ . (write an expression that is equivalent but has only  $\sin\theta$  in it)

$$\tan\theta = \frac{\sin\theta}{\cos\theta}$$

Ex. 2 Write  $\csc\theta\cot\theta$  in terms of  $\sin\theta$  and  $\cos\theta$  and simplify.

Ex. 3 Add or subtract then simplify by using  $\sin\theta$  and  $\cos\theta$ .

$$\frac{\sin\theta}{\cos\theta} + \frac{1}{\sin\theta} \quad \text{We need a common denominator!}$$

$$\text{Ex. 4 } \frac{1}{\sin\theta} - \sin\theta$$

Ex. 5  $\frac{1}{\sin\theta} + \frac{1}{\cos\theta}$

Ex. 6 Multiply  $(\sin\theta + 4)(\sin\theta + 3)$

Ex. 7 Show the two sides are equal by transforming the left side to equal the right.

$$\cos\theta \tan\theta = \sin\theta$$

Ex. 8  $(\sin\theta - \cos\theta)^2 - 1 = -2\sin\theta\cos\theta$

Homework (3,6,9,12,15,18,21,24,27,30,33,36,39,42,45,48,51,52,54,68,74,76)