Algebra 2 | Tues. 1-22-13 | Class Notes

Ch. 11-3 Fundamental Trig. Identities

Reciprocal —

Tangent —

* Pythagorean — (Fundamental Iden. of Trig).

Negative Angle

Use "parent" forms to find other useful forms.

Ex 5
Pg 772-773

- $\sec\theta = \csc\theta \tan\theta$
- $\csc(-\theta) = -\csc\theta$
- $\dfrac{\sin^2\theta}{1-\cos\theta}$
- $\sec\theta - \tan\theta \sin\theta$

Reciprocal Identities

θ = theta, represents any angle

$$\sin\theta = \frac{1}{\csc\theta} \quad *$$

$$\cos\theta = \frac{1}{\sec\theta} \quad *$$

$$\tan\theta = \frac{1}{\cot\theta} \quad *$$

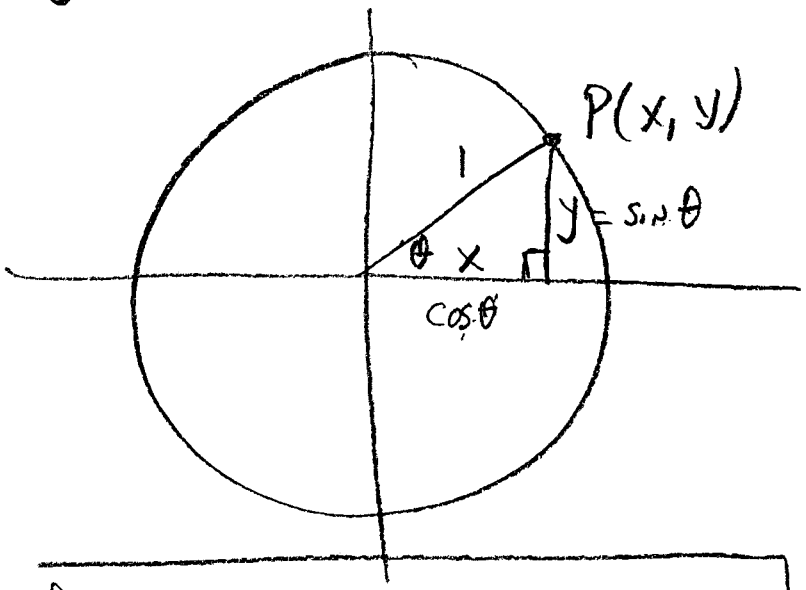
Tangent Identity

$$\frac{\sin\theta}{\cos\theta} = \frac{\frac{O}{H}}{\frac{a}{H}} = \frac{O}{H} \cdot \frac{H}{a} = \frac{O}{a} = \tan\theta$$

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

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

Fundamental Identity of Trig
or
Pythagorean Identity



$$\sin^2\theta + \cos^2\theta = 1 \quad *$$

$$\sin^2\theta = 1 - \cos^2\theta \text{ or } (1-\cos\theta)(1+\cos\theta)$$

$$\cos^2\theta = 1 - \sin^2\theta \text{ or } (1-\sin\theta)(1+\sin\theta)$$

$$\frac{\sin^2\theta}{\cos^2\theta} + \frac{\cos^2\theta}{\cos^2\theta} = \frac{1}{\cos^2\theta} \quad \div \text{ by } \cos^2\theta$$

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

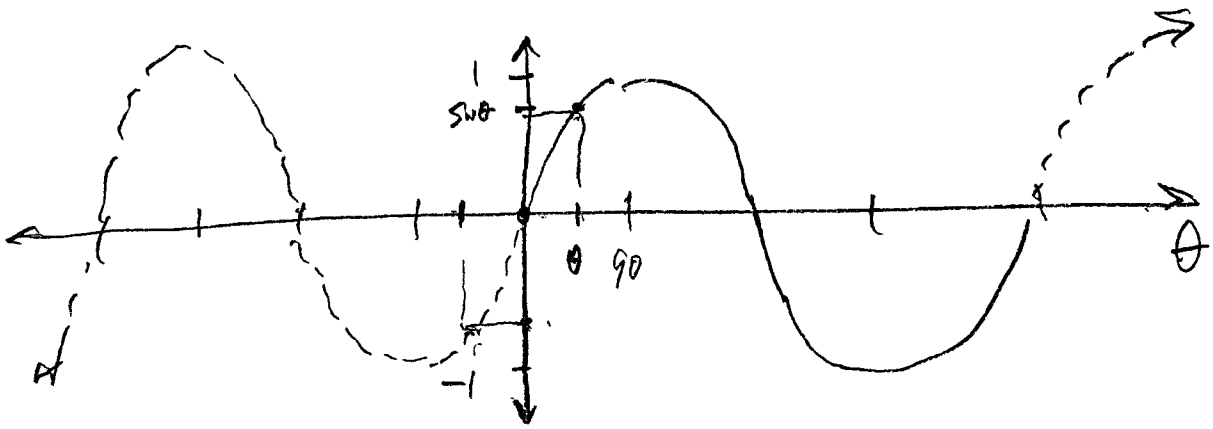
$$\frac{\sin^2\theta}{\sin^2\theta} + \frac{\cos^2\theta}{\sin^2\theta} = \frac{1}{\sin^2\theta} \quad \div \sin^2\theta$$

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

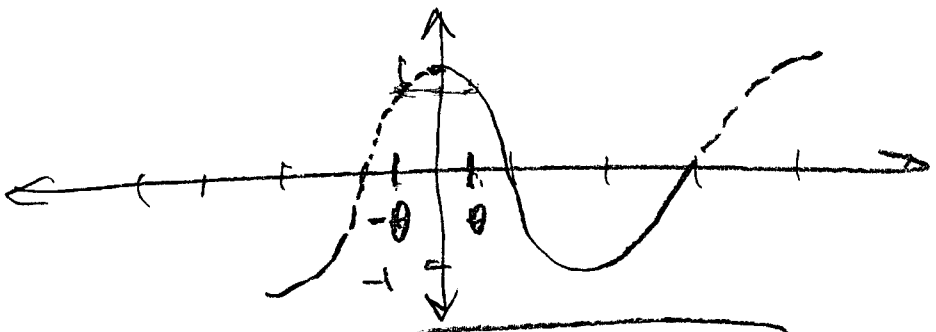
Other forms of the Pythagorean Identities

Negative Angle Identities

$\sin(-\theta)$, $\cos(-\theta)$, $\tan(-\theta)$ = ??



$$\sin(-\theta) = -\sin\theta \quad *$$



$$\cos(-\theta) = \cos(\theta) \quad *$$

$$\tan(-\theta) = -\tan\theta \quad *$$

(Ex) Pg 772-773 Simplify / Verify (No =) (=)

(Ex) $\sec\theta = \csc\theta \tan\theta$

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

$\sec\theta = \frac{1}{\cos\theta}$

$\sec\theta = \sec\theta$ ✓

(Ex) $\csc(-\theta) = -\csc\theta$

$\frac{1}{\sin(-\theta)} = -\frac{1}{\sin\theta}$

$\frac{1}{\sin(-\theta)} = \frac{1}{-\sin\theta}$ ✓

(EX) $\dfrac{\sin^2\theta}{1-\cos^2\theta}$

$\sin^2\theta+\cos^2\theta=1$

$\sin^2\theta=1-\cos^2\theta$

$\dfrac{\sin^2\theta}{\sin^2\theta}=1$

(EX) $\sec\theta-\tan\theta\sin\theta$

$\dfrac{1}{\cos\theta}-\dfrac{\sin\theta}{\cos\theta}\cdot\sin\theta$

$\dfrac{1-\sin^2\theta}{\cos\theta}$

$\dfrac{\cos^2\theta}{\cos\theta}=\dfrac{(\cos\theta)(\cos\theta)}{\cos\theta}$

$\cos\theta$