

For each of the following equations, find the solutions that lie in the domain  $0 \leq x < 2\pi$ .

1)  $2 \sin \theta = \sqrt{2}$

$$\sin \theta = \frac{\sqrt{2}}{2}$$

$$\boxed{\frac{\pi}{4}, \frac{3\pi}{4}}$$

3)  $4 \sin \theta + 2 = 0$

$$4 \sin \theta = -2$$

$$\sin \theta = -\frac{1}{2}$$

$$\frac{\pi}{6}$$

In Quad:  
III, IV

$$\boxed{\frac{7\pi}{6}, \frac{11\pi}{6}}$$

5) Using the triangle below, find:

a.  $\sin A$

$$\boxed{\frac{a}{c}}$$

b.  $\sec A$

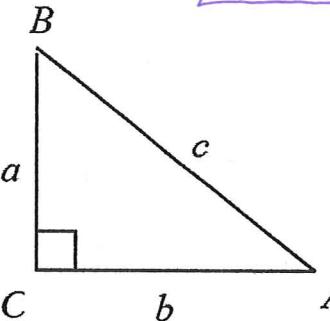
$$\boxed{\frac{c}{b}}$$

c.  $\csc B$

$$\boxed{\frac{c}{b}}$$

d.  $\tan B$

$$\boxed{\frac{b}{a}}$$



For each of the following equations, find the solutions that lie in the domain  $0 \leq x < 2\pi$ .

6)  $\sec^2 \theta + 3 = 4$

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

$$\sec \theta = \pm 1$$

$$\cos \theta = \pm 1$$

$$\boxed{0, \pi}$$

7)  $\cot \theta = \sqrt{3}$

$$\tan \theta = \frac{1}{\sqrt{3}} \cdot \sqrt{3}$$

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

$$\boxed{\frac{\pi}{6}, \frac{7\pi}{6}}$$

8) Rewrite each of the following expressions in terms of either  $\sin(\theta)$  or  $\cos(\theta)$ .

a)  $\tan(\theta)$

$$\boxed{\frac{\sin \theta}{\cos \theta}}$$

b)  $\csc(\theta)$

$$\boxed{\frac{1}{\sin \theta}}$$

c)  $\cot(\theta)$

$$\boxed{\frac{\cos \theta}{\sin \theta}}$$

d)  $\sec(\theta)$

$$\boxed{\frac{1}{\cos \theta}}$$

Verify each identity.

$$9) \tan \theta \sin \theta \cos \theta \csc^2 \theta = 1$$

$\frac{\sin \theta}{\cos \theta} \cdot \frac{\sin \theta}{1} \cdot \frac{\cos \theta}{1} \cdot \frac{1}{\sin^2 \theta}$

Diagram: A square divided into four quadrants by a vertical and horizontal line. Arrows point from the top-left quadrant to the first term, the bottom-right quadrant to the second term, the top-right quadrant to the third term, and the bottom-left quadrant to the fourth term.

$$10) \sin^2 \theta + \sin^2 \theta \tan^2 \theta = \tan^2 \theta$$

$$\begin{aligned} & \sin^2 \theta (1 + \tan^2 \theta) \\ & \sin^2 \theta (\sec^2 \theta) \\ & \sin^2 \theta \left( \frac{1}{\cos^2 \theta} \right) \\ & \frac{\sin^2 \theta}{\cos^2 \theta} \\ & \boxed{\tan^2 \theta} \end{aligned}$$

$$11) \frac{1 + \tan^2 \theta}{1 + \cot^2 \theta} = \tan^2 \theta$$

$$\frac{\sec^2 \theta}{\csc^2 \theta}$$

$$\frac{\frac{1}{\cos^2 \theta}}{\frac{1}{\sin^2 \theta}} = \frac{1}{\cos^2 \theta} \cdot \frac{\sin^2 \theta}{1} = \frac{\sin^2 \theta}{\cos^2 \theta} = \boxed{\tan^2 \theta}$$

Find the exact value.

$$12) \cos 195^\circ$$

A coordinate plane diagram shows the angle  $195^\circ$  starting from the positive x-axis, measured counter-clockwise. The terminal side is in the third quadrant.

Sorry  
We didn't learn this!

$$13) \sin \frac{25\pi}{12}$$

#### ANSWERS

$$1) \theta = \frac{\pi}{4}, \frac{3\pi}{4}$$

$$2) \theta = \frac{5\pi}{6}, \frac{7\pi}{6}$$

$$3) \theta = \frac{7\pi}{6}, \frac{11\pi}{6}$$

$$4) \theta = 0, \pi$$

$$5a) \frac{a}{c} \quad 5b) \frac{c}{b} \quad 5c) \frac{c}{b} \quad 5d) \frac{b}{a}$$

$$6) \theta = 0, \pi$$

$$7) \theta = \frac{\pi}{6}, \frac{7\pi}{6}$$

$$8a) \frac{\sin \theta}{\cos \theta} \quad 8b) \frac{1}{\sin \theta} \quad 8c) \frac{\cos \theta}{\sin \theta}$$

$$8d) \frac{1}{\cos \theta}$$

$$9-11) \text{ Proofs } \odot$$

$$12) \frac{-\sqrt{2} - \sqrt{6}}{4}$$

$$13) \frac{-\sqrt{2} + \sqrt{6}}{4}$$