

Warm-up

1. Find  $\sqrt{25}$

2. Solve  $x^2 = 4$

3. explain the difference

Find all 6 trigonometric functions given the following

c.  $\tan \theta = -\frac{15}{8}$ , <sup>opp</sup>/<sub>adj</sub>  
in quadrant IV

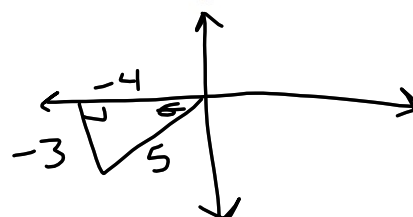
d.  $\csc \theta = 4$ ,  
in quadrant II

1)  $\cot \theta = -\frac{1}{2}$  and  $\cos \theta > 0$

$$\begin{aligned} \sin \theta &= -\frac{3}{5} \\ \cos \theta &= \frac{4}{5} \\ \csc \theta &= -\frac{5}{3} \\ \sec \theta &= \frac{5}{4} \\ \cot \theta &= \frac{4}{3} \end{aligned}$$

3)  $\cot \theta = \frac{12}{5}$  and  $\cos \theta > 0$

2)  $\tan \theta = \frac{3}{4}$  and  $\cos \theta < 0$



4)  $\cos \theta = -\frac{4}{5}$  and  $\sin \theta > 0$

Solve

$$1. \sin \theta = \frac{\sqrt{3}}{2}$$

60° or 120°  
 $\frac{\pi}{3}$  or  $\frac{2\pi}{3}$

when  $0 < \theta < 360^\circ$   
and  $0 \leq \theta \leq 2\pi$

$$2. \tan \theta = -\sqrt{3}$$

120° or 300°

$\frac{2\pi}{3}$  or  $\frac{5\pi}{3}$

$$3. \csc \theta = 2$$

30° or 150°

$\frac{\pi}{6}$  or  $\frac{5\pi}{6}$

In order to get one answer we must restrict the domain.

$$\arcsin \theta \quad -\frac{\pi}{2} \leq \theta \leq \frac{\pi}{2}$$

$$\arccos \theta \quad 0 \leq \theta \leq \pi$$

$$\arctan \theta \quad -\frac{\pi}{2} < \theta < \frac{\pi}{2}$$

$$\operatorname{arccot} \theta \quad 0 < \theta < \pi$$

$\operatorname{arccsc}$  and  $\operatorname{arcsec}$  have the same domain as the reciprocal

\*we will understand this more when we graph.\*

## Simplify

1)  $\sec^{-1}(-\sqrt{2})$

$135^\circ$

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

3)  $\sin^{-1} 1$

$90^\circ$  or  $\frac{\pi}{2}$

2)  $\cot^{-1} 0$

undefined

41.

$0^\circ$  or  $0$

43.

$0^\circ$  or  $0$

45.

$45^\circ$  or  $\frac{\pi}{4}$

47.  $45^\circ$  or  $\frac{\pi}{4}$

### Composition of functions

1)  $\csc \left[ \sec^{-1} \frac{2\sqrt{3}}{3} \right]$   
 $= \csc \left( \frac{\pi}{6} \right) = 2$

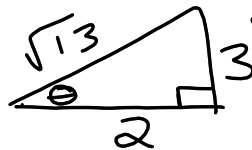
2)  $\sin^{-1}(\sec \pi)$

$\sin^{-1}(-1) = -\frac{\pi}{2}$

3)  $\cos \cot^{-1} \frac{2}{3}$

$= \frac{2}{\sqrt{13}} = \frac{2\sqrt{13}}{13}$

54.  $-30^\circ$  or  $-\frac{\pi}{6}$



$2^2 + 3^2 = c^2$   
 $4 + 9 = c^2$   
 $\sqrt{13} = c$

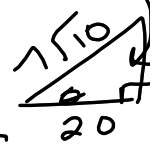
4)  $\sin \sec^{-1} \frac{7\sqrt{10}}{20}$

$(7\sqrt{10})^2 = 20^2 + b^2$   
 $490 = 400 + b^2$

$b = 3\sqrt{10}$

$= \frac{3\sqrt{10}}{7\sqrt{10}} = \frac{3}{7}$

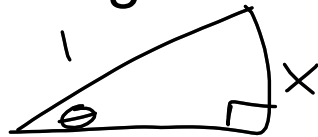
55.  $\pi$  or  $180^\circ$



Write as an algebraic expression

5)  $\cos \sin^{-1} x$

$$\sqrt{1-x^2}$$



$$x^2 + b^2 = 1^2$$
$$\sqrt{b^2} = \sqrt{1-x^2}$$

6)  $\sec \tan^{-1} x$

7)  $\sec \cos^{-1} x$

## Using your calculator