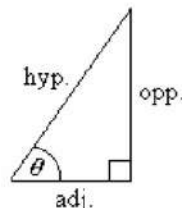


SohCahToa and Reciprocal Trig Functions**The Trigonometric Ratios**

The six trigonometric ratios are defined in the following way based on this right triangle and the angle θ

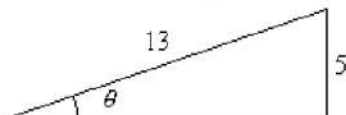
adj. = adjacent side to angle θ
 opp. = opposite side to angle θ
 hyp. = hypotenuse of the right triangle



$$\boxed{\text{SOH CAH TOA}} \rightarrow \sin \theta = \frac{\text{opp.}}{\text{hyp.}} \quad \cos \theta = \frac{\text{adj.}}{\text{hyp.}} \quad \tan \theta = \frac{\text{opp.}}{\text{adj.}}$$

$$\text{Reciprocal functions} \rightarrow \csc \theta = \frac{\text{hyp.}}{\text{opp.}} \quad \sec \theta = \frac{\text{hyp.}}{\text{adj.}} \quad \cot \theta = \frac{\text{adj.}}{\text{opp.}}$$

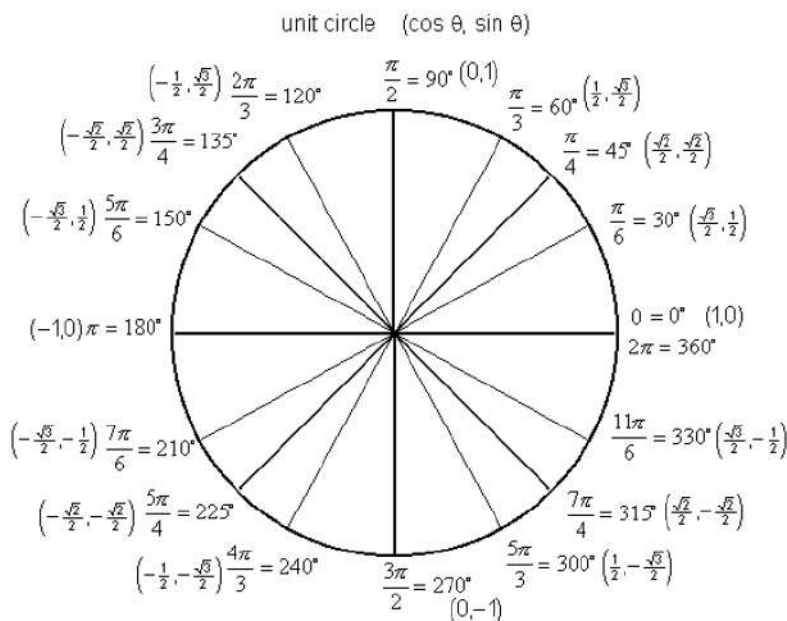
Ex. Find the exact values of all 6 trigonometric functions of the angle θ shown in the figure.



SOLUTION: first you'll need to determine the 3rd side using $a^2 + b^2 = c^2 \rightarrow a^2 + 5^2 = 13^2 \rightarrow a = 12$
 So for the angle labeled θ , ADJACENT = 12, OPPOSITE = 5 and HYPOTENUSE = 13

$$\sin \theta = \frac{\text{opp}}{\text{hyp}} = \frac{5}{13} \quad \cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{12}{13} \quad \tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{5}{12}$$

$$\csc \theta = \frac{\text{hyp}}{\text{opp}} = \frac{13}{5} \quad \sec \theta = \frac{\text{hyp}}{\text{adj}} = \frac{13}{12} \quad \cot \theta = \frac{\text{adj}}{\text{opp}} = \frac{12}{5}$$

The Unit Circle

The trig. ratios are defined as ...

$$\sin t = y$$

$$\cos t = x$$

$$\tan t = \frac{y}{x}, x \neq 0$$

$$\csc t = \frac{1}{y}, y \neq 0$$

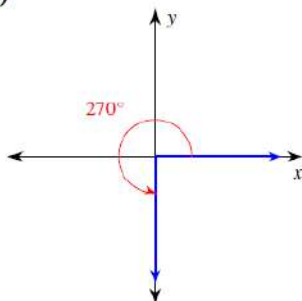
$$\sec t = \frac{1}{x}, x \neq 0$$

$$\cot t = \frac{x}{y}, y \neq 0$$

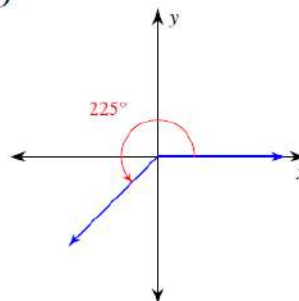
No Calculator but you may refer to the unit circle. As you are doing each problem, you should be focused on being able to do the problems without using the unit circle for WS 2.

Find the exact value of each trigonometric function.

9) $\cos \theta$



10) $\tan \theta$



11) $\cos 270^\circ$

12) $\sin 0$

13) $\cot \frac{7\pi}{4}$

14) $\csc \frac{2\pi}{3}$

15) $\csc 225^\circ$

16) $\sin 300^\circ$

17) $\csc 90^\circ$

18) $\tan 240^\circ$

19) $\sin \frac{\pi}{4}$

20) $\tan 120^\circ$

21) $\tan -\frac{13\pi}{6}$

22) $\cos -630^\circ$

23) $\cos 990^\circ$

24) $\csc -\frac{31\pi}{6}$

25) $\csc -\frac{5\pi}{6}$

26) $\cos -\frac{17\pi}{3}$

27) $\sin \frac{29\pi}{6}$

28) $\sec 945^\circ$

29) $\cos -\frac{11\pi}{2}$

30) $\sin -2\pi$

You should be attempting these without looking at the unit circle and referring to the unit circle to see if you were right or not.

17.2 Evaluate trig functions without the use of a calculator

Find the exact value of each trigonometric function.

1) $\sec -90^\circ$

2) $\sin -\frac{\pi}{4}$

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

4) $\tan 45^\circ$

5) $\csc 210^\circ$

6) $\cos -\frac{3\pi}{4}$

7) $\sec -60^\circ$

8) $\cot \frac{4\pi}{3}$

9) $\sin 330^\circ$

10) $\cot -90^\circ$

11) $\tan -\frac{3\pi}{2}$

12) $\sin \frac{11\pi}{6}$

13) $\tan -\frac{\pi}{4}$

14) $\cot -\frac{5\pi}{4}$

15) $\sin \frac{5\pi}{3}$

16) $\cos -180^\circ$

17) $\cos -210^\circ$

18) $\cos -\frac{2\pi}{3}$

19) $\cot -\frac{\pi}{2}$

20) $\tan -\frac{\pi}{2}$

21) $\csc -420^\circ$

22) $\cos 1050^\circ$

23) $\cot -840^\circ$

24) $\csc -\frac{3\pi}{4}$

25) $\sin -450^\circ$

26) $\sin 240^\circ$

27) $\csc \pi$

28) $\csc -\frac{31\pi}{6}$

29) $\sec -390^\circ$

30) $\cos -930^\circ$

Summary Assignment Week 3

Name: _____ Date: _____ Pd: _____

Identify the following trig function values: Try your best not to look at the unit circle until you are completely done.

1. $\tan 90^\circ$	2. $\csc 120^\circ$
3. $\cot 300^\circ$	4. $\sec -60^\circ$
5. $\sec \frac{5\pi}{4}$	6. $\tan \frac{4\pi}{3}$
7. $\sin 45^\circ \cos 210^\circ$	8. $\tan \frac{5\pi}{3} \cot \frac{2\pi}{3}$
9. $\frac{\sin^2 210^\circ \csc 300^\circ}{\sec 240^\circ}$	