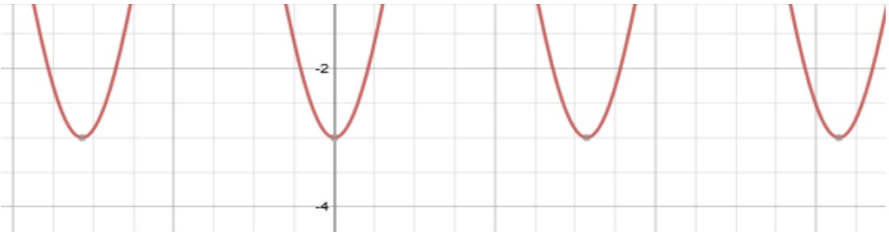
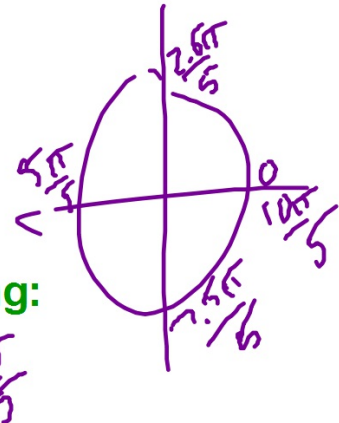


Warm up

1. Write a sine function for the graph



2. Find the reference angle for the following:
a. $13\pi/7$ b. $14\pi/5$



3. Find a positive and negative coterminal angle for each of the following

a. $\frac{5\pi}{2}$ b. $\frac{23\pi}{5}$ c. 785°

$$6. \sin \theta = \frac{3}{4}, \cos \theta = \frac{\sqrt{7}}{4}, \tan \theta = \frac{3}{\sqrt{7}}, \csc \theta = \frac{4}{3}, \sec \theta = \frac{4}{\sqrt{7}}, \cot \theta = \frac{\sqrt{7}}{3}$$

$$8. \sin \theta = \frac{9}{13}, \cos \theta = \frac{2\sqrt{22}}{13},$$

$$\tan \theta = \frac{9}{2\sqrt{22}}, \csc \theta = \frac{13}{9}, \sec \theta = \frac{13}{2\sqrt{22}}, \cot \theta = \frac{2\sqrt{22}}{9}$$

1. The 450° angle lies on the positive- y axis ($450^\circ - 360^\circ = 90^\circ$), while the others are all coterminal in Quadrant II.

33) $\frac{\sqrt{3}}{2}$ 74) $\frac{\sqrt{2}}{2}$

2. The $-\frac{5\pi}{3}$ angle lies in Quadrant I ($-\frac{5\pi}{3} + 2\pi = \frac{\pi}{3}$), while the others are all coterminal in Quadrant IV.

$$4. \sin \theta = -\frac{3}{5}, \cos \theta = \frac{4}{5}, \tan \theta = -\frac{3}{4}, \csc \theta = -\frac{5}{3},$$

$$\sec \theta = \frac{5}{4}, \cot \theta = -\frac{4}{3}$$

$$8. \sin \theta = -\frac{3}{\sqrt{13}}, \cos \theta = -\frac{2}{\sqrt{13}}, \tan \theta = \frac{3}{2},$$

$$\csc \theta = -\frac{\sqrt{13}}{3}, \sec \theta = -\frac{\sqrt{13}}{2}, \cot \theta = \frac{2}{3}$$

9. $\sin \theta = 1, \cos \theta = 0, \tan \theta$ undefined; $\csc \theta = \sec \theta$ undefined, $\cot \theta = 0$.

43. Since $\cot \theta > 0$, $\sin \theta$ and $\cos \theta$ have the same sign, so

$$\sin \theta = +\sqrt{1 - \cos^2 \theta} = \frac{\sqrt{5}}{3}, \text{ and } \tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{\sqrt{5}}{2}.$$

44. Since $\tan \theta < 0$, $\sin \theta$ and $\cos \theta$ have opposite signs,

$$\text{so } \cos \theta = -\sqrt{1 - \sin^2 \theta} = -\frac{\sqrt{15}}{4}, \text{ and}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta} = -\sqrt{15}.$$

- 1. Find a coterminal angle between 0 and 360° or 0 and 2π**
- 2. If terminates in the 1st quadrant it equals itself**
- 3. If terminates in the 2nd quadrant it is $180^\circ - \theta$**
- 4. If terminates in the 3rd quadrant it is $\theta - 180^\circ$**
- 5. If terminates in the 4th quadrant it is $360^\circ - \theta$**

Examples: Find the reference angle for the following:

1. 120° 2. -135° 3. 200° 4. 290°

$$60^\circ$$

$$45^\circ$$

$$20^\circ$$

$$70^\circ$$

$$225^\circ$$

6. $3\pi/5$ 7. $3\pi/7$ 8. $26\pi/7$ 9. $-11\pi/6$

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

$$\frac{3\pi}{7}$$

$$\frac{2\pi}{7}$$

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

1. Find a coterminal angle between 0 and 360° or 0 and 2π

2. If terminates in the 1st quadrant it equals itself

3. If terminates in the 2nd quadrant it is $180^\circ - \theta$

4. If terminates in the 3rd quadrant it is $\theta - 180^\circ$

5. If terminates in the 4th quadrant it is $360^\circ - \theta$

Objective: To find inverse trig functions

For a functions to have an inverse it must pass what test?

test?



For Trig Functions we have to restrict the domain to study the inverse.

Function	Inverse	Domain of inverse	Range of inverse
$\sin \theta$	$\arcsin \theta$ $\sin^{-1} \theta$	$[-1, 1]$	$[-\frac{\pi}{2}, \frac{\pi}{2}]$
$\cos \theta$	$\arccos \theta$ $\cos^{-1} \theta$	$[-1, 1]$	$[0, \pi]$
$\tan \theta$	$\arctan \theta$ $\tan^{-1} \theta$	$(-\infty, \infty)$	$[-\frac{\pi}{2}, \frac{\pi}{2}]$

Evaluate

$$\sin \theta = 1/2$$

1. $\arcsin(1/2) = \pi/6$ [REDACTED]

$\pi/6, \pi/4$

2. $\arctan(-1) = -\pi/4$ [REDACTED]

~~$\pi/4$~~ , $7\pi/4$

3. $\sin[\arcsin(1/2)] = 1/2$



4. $\arcsin(\sin 2\pi/3) = \pi/3$

$\arcsin \sin x$

[REDACTED]
 $\arcsin \frac{\sqrt{3}}{2}$
 $\sin \theta = \frac{\sqrt{3}}{2}$

Evaluating composition of functions
Make a sketch of a right triangle.

SOH CAH TOA
CSC HO SEC
HA HT HO

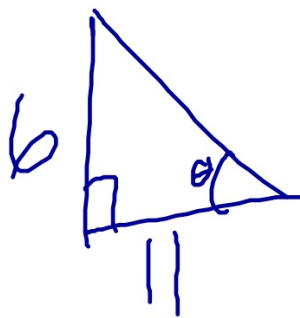
1. $\sin(\arctan 4/3)$

2. $\sec(\arcsin 3/5)$

3. $\cot(\arctan 6/11)$

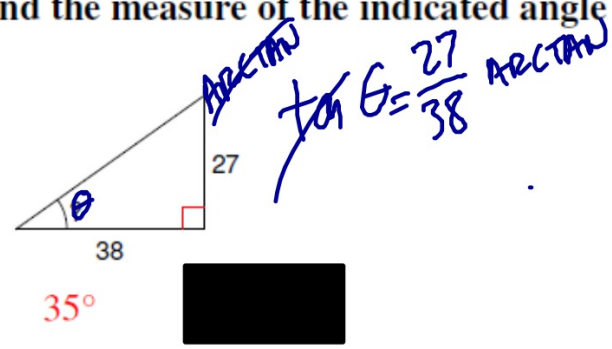
$$\cot \theta = \frac{11}{6}$$

4. $\cos(\arcsin (-3/5))$

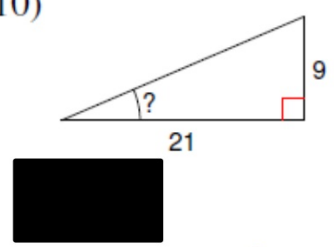


Find the measure of the indicated angle to the nearest degree.

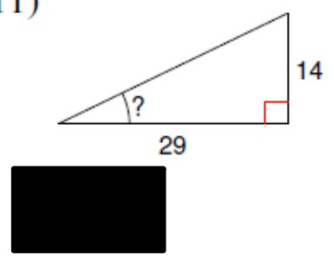
9)



10)

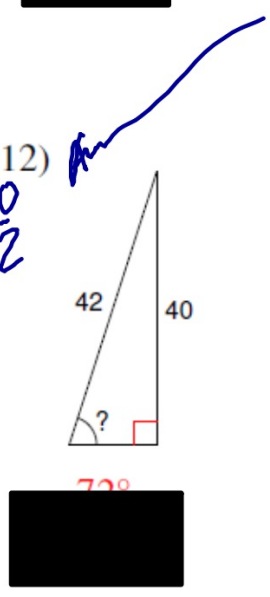


11)

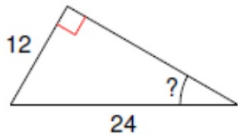


~~ARCTAN~~
 $\sin \theta = \frac{40}{42}$

12)



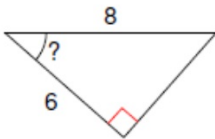
15)



30°



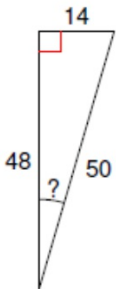
17)



41°



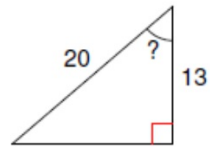
19)



16°



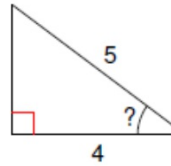
16)



49°



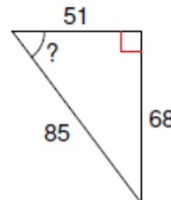
18)



37°



20)



53°



Warm-up

Complete the following chart for each inverse trig function

Inverse	Domain	Range
arccos		
arcsin		
arctan		