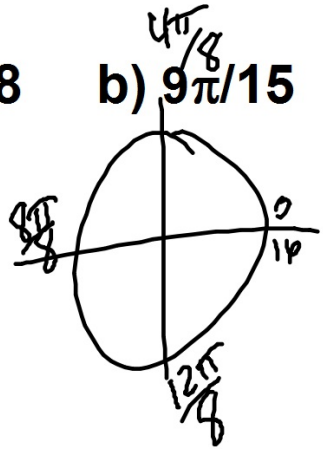
Warm up

1. Add and subtract 2π to each fraction below:

a) $2\pi/3$ b) $12\pi/13$ c) $9\pi/4$ d) $7\pi/8$

2) Using the unit circle as a reference, name what quadrant each fraction is in:

a) $13\pi/8$ b) $9\pi/15$ c) $8\pi/9$ d) $11\pi/13$



Objective: Find an equation of a Sin and Cos function given values or graph.

$\frac{2\pi}{b}$ $\frac{2\pi}{\text{period}}$ $A\cos(b\theta + c)$

Period = $2\pi/b$ so b = 2π/period

Phase shift is -c/b so c = -b(phase shift)

$\frac{-c}{b}$ $-b \cdot (p.s.)$

1. Find a Cosine function that has a period of 4π and an amplitude of 3

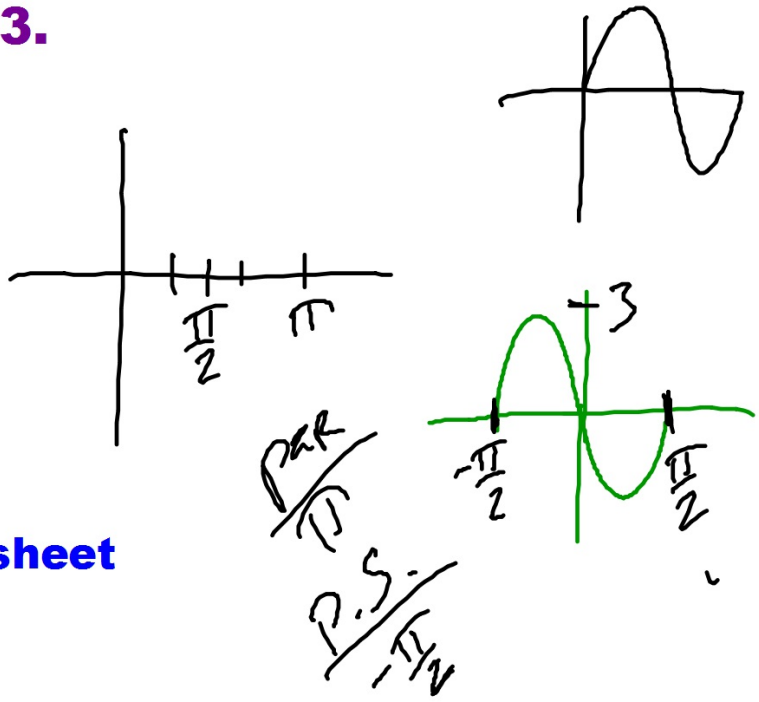
$y = \pm 3 \cos\left(\frac{1}{2}\theta\right)$ $\frac{2\pi}{4\pi} = \frac{1}{2}$

2. Sine function with a period of π/2 , a phase shift of π/4, a vertical shift of 4, and an amplitude of 1/2.

$y = \pm \frac{1}{2} \sin\left(4\theta - \pi\right) + 4$ $\frac{2\pi}{\frac{\pi}{2}} = 4$

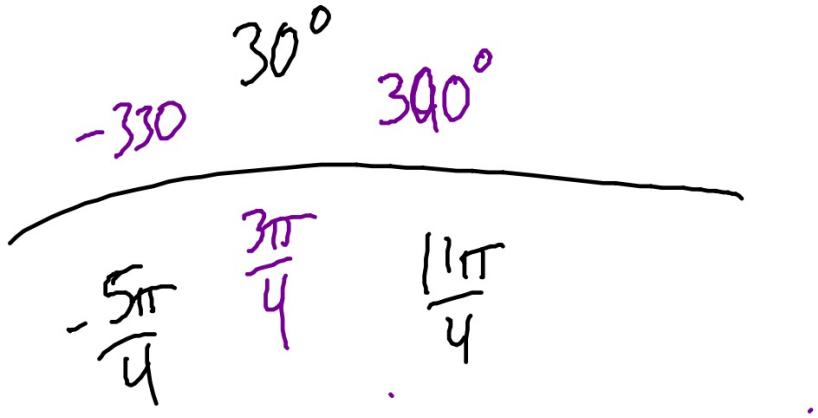
$\frac{\pi}{4} \cdot -4$

3. Sine function who has a period of 3, a phase shift of 2, a vertical shift of 3, and an amplitutde of 3.



Practice Worksheet

To find coterminal angles you add or subtract 360° or 2π



Reference angle an angle that measure the distance from where an angle terminates and the closest x axis.

Steps for finding a reference angle.

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° - θ**
4. **If terminates in the 3rd quadrant it is θ - 180°**
5. **If terminates in the 4th quadrant it is 360° - θ**

$\frac{5\pi}{4}$ 1) $\boxed{\frac{13\pi}{4}}$ 2) $\boxed{\frac{15\pi}{8}}$ $\frac{\pi}{8}$.

$\frac{\pi}{4}$

IV

Objective: Find the trig values for a right triangle.

SOH CAH TOA

The six trig functions are

Sineϕ= $\frac{\sqrt{112}}{16}$ **cosecantϕ=** $\frac{16}{\sqrt{112}}$

Cosineϕ= $\frac{12}{16} = \frac{3}{4}$ **Secantϕ=** $\frac{4}{3}$

Tangentϕ= $\frac{\sqrt{112}}{12}$ **Cotangentϕ=** $\frac{12}{\sqrt{112}}$

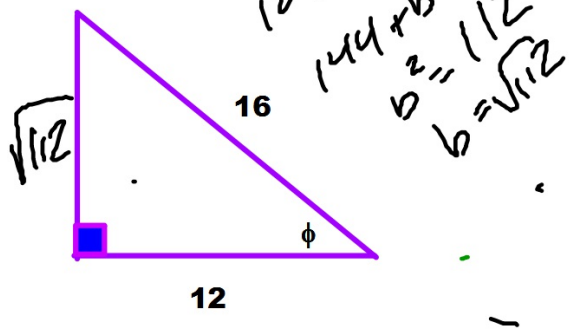
$a^2 + b^2 = c^2$

$12^2 + b^2 = 16^2$

$144 + b^2 = 256$

$b^2 = 112$

$b = \sqrt{112}$



Find the six trig values given one

Examples

1. tan θ = 7/5

$\sin\theta = \frac{7}{\sqrt{74}}$

$\cos\theta = \frac{5}{\sqrt{74}}$

$\cot\theta = \frac{5}{7}$

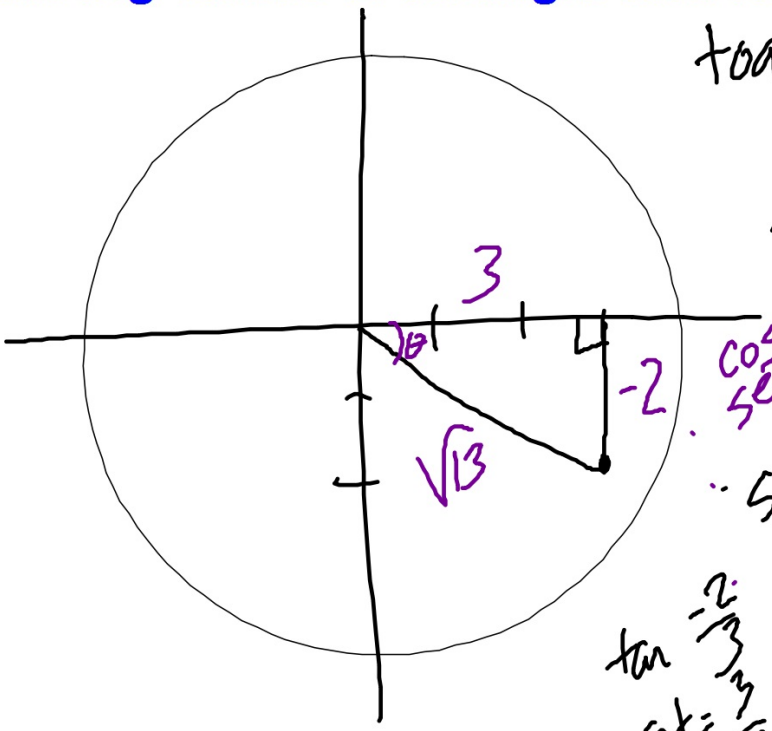
$\sec\theta = \frac{\sqrt{74}}{5}$

$\csc\theta = \frac{\sqrt{74}}{7}$

2. Secant θ = 7/3

Evaluate trig functions by a point on the terminal side

1. Find the six trig values of an angle that terminates at (3,-2)



TOA

$\frac{3}{\sqrt{13}}$ $\frac{\sqrt{13}}{3}$

cos sec

$\therefore \sin\theta = -\frac{2}{\sqrt{13}}$ $\csc\theta \frac{\sqrt{13}}{2}$

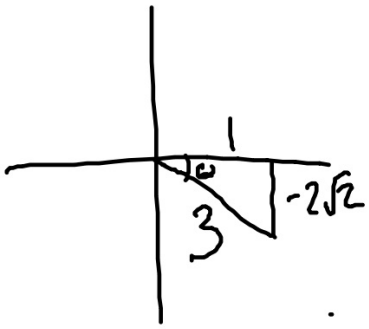
$\tan = \frac{-2}{3}$

$\cot = \frac{3}{-2}$

2. Find the six trig values given

cosθ = 1/3 and tanθ < 0

I, IV



cscθ = 4/3 and cotθ > 0

Wrap up

1) Find one positive and negative coterminal angle for:

a) -30° b) $2\pi/3$ c) $13\pi/8$ d) 245° e) $7\pi/6$

2) What is the reference angle for each angle in #1?

3) Find the six trig values given

a) $\sin\theta = 4/7$ and $\tan\theta > 0$

b) $\sec\theta = 6/5$ and $\tan\theta < 0$