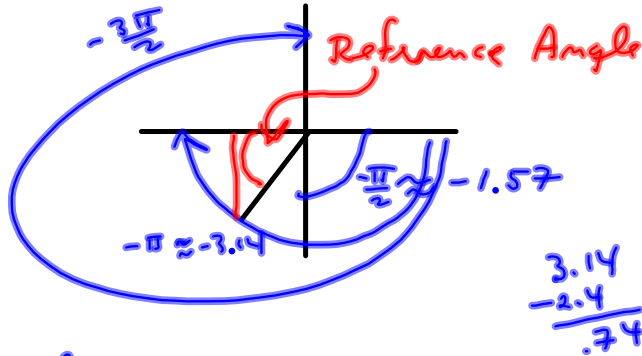


Worksheet for next Monday to be finished this afternoon.

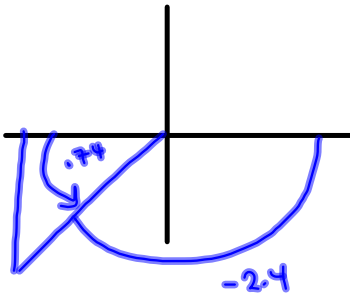
Find the reference angle, draw the Δ .

$\theta = -2.4$

$2\pi - 2.4 \approx 6.28 - 2.4 \approx 3.78$ if you want positive (3.78 is coterminal with -2.4)



Reference angle $-\pi + 2.4 = -(\pi - 2.4) \approx$
 your reference angle.

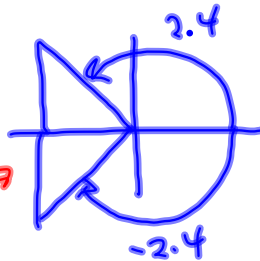


$\sin \theta =$
 $\cos \theta =$
 $\tan \theta =$

```

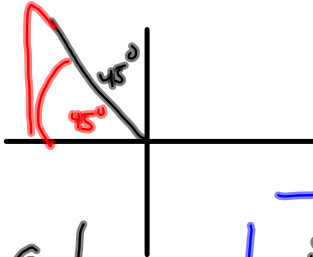
sin(.74)
.6742879116
sin(2.4)
.6754631806
sin(-2.4)
-.6754631806
    
```

is negative,
 so sine is negative.



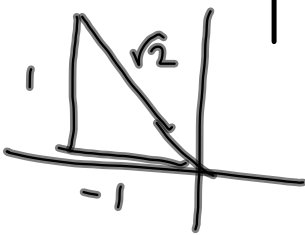
Find the reference angle & values of trig.

$$\theta = +135^\circ$$



$$135^\circ - 90^\circ = 45^\circ \text{ just to locate.}$$

$$180^\circ - 135^\circ = \underline{45^\circ} = \theta'$$



$$\sin(135^\circ) = \frac{1}{\sqrt{2}}$$

$$\cos(135^\circ) = -\frac{1}{\sqrt{2}}$$

$$\tan(135^\circ) = -1$$

$$\underline{\csc}(135^\circ) = \sqrt{2}$$

$$\underline{\sec}(135^\circ) = -\sqrt{2}$$

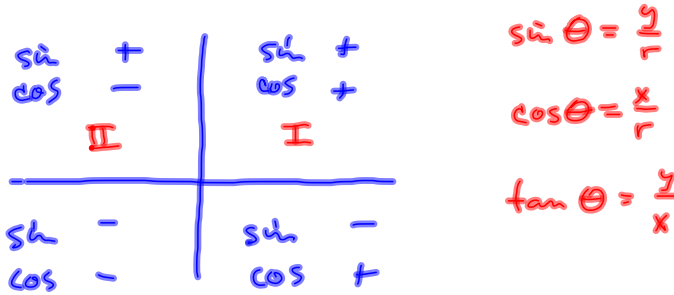
$$\underline{\cot}(135^\circ) = -1$$

SOHCAHTOA



Basically, work off your 1st quadrant understanding and then determine if x and y are negative, to get the signs right.

I don't memorize the signs in each quadrant; rather, I draw the reference triangle, and check the x's and y's for their sign.



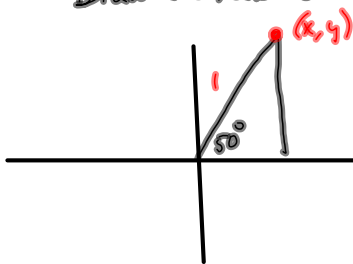
$\cot 410^\circ \approx .8391$ Pg 169 gives calculator keystrokes for cot, csc, sec.

```

- .6754631806
tan(410*pi/180)
1.191753593 ← tan(410°)
Ans-1
.8390996312 ← to the negative 1 power.
tan(410*pi/180)-1
.8390996312
    
```

Slipped conversion of degrees to radians inside the function.

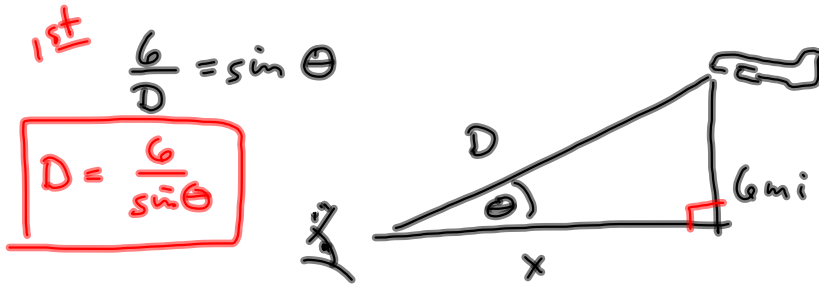
Draw the reference triangle.



$$+1 \quad 410^\circ - 360^\circ = \underline{\underline{50^\circ}}$$

$$x \approx .6428$$

$$y \approx .7660$$

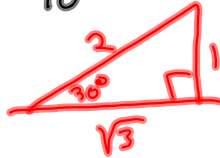


How far away is the plane when $\theta = 30^\circ$? (from the eyes of the observer)

Find D

$\theta = 45^\circ$?

$\theta = 90^\circ$



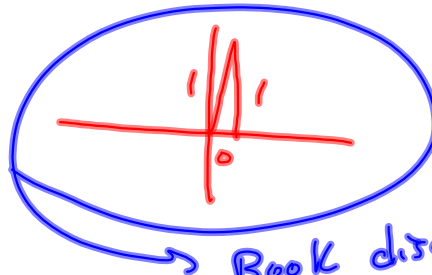
$\frac{6}{\sin(30^\circ)} = \frac{6}{\frac{1}{2}} = 12 \text{ miles}$

$\frac{6}{\sin 45^\circ} = \frac{6}{\frac{1}{\sqrt{2}}} = 6\sqrt{2} \text{ miles}$

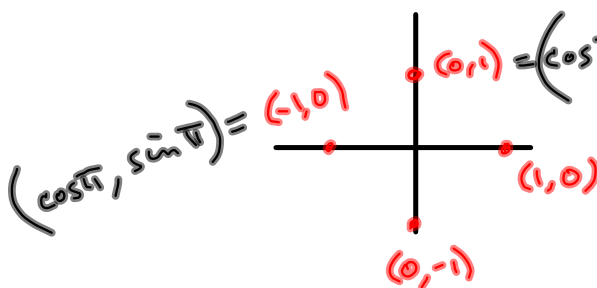


$\approx 6(1.4142) = 2.4852 \text{ miles.}$

$\theta = 90^\circ$: 6 miles



Book discussion in §1.4 about quadrant angles. These are the ones I called "degenerate" triangles.



Find sine, cosine, tangent

$$\frac{10\pi}{3}$$

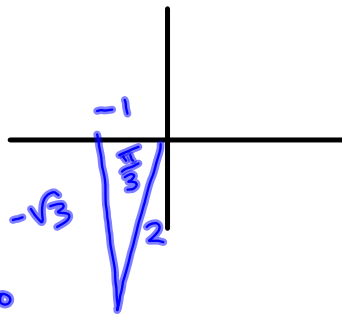
$$\pi \cdot \frac{10}{3} = (3 \frac{1}{3})\pi = 3\pi + \frac{\pi}{3}$$

$$3\pi = 2\pi + \pi$$

$$\sin\left(\frac{10\pi}{3}\right) = -\frac{\sqrt{3}}{2}$$

$$\cos\left(\frac{10\pi}{3}\right) = -\frac{1}{2}$$

$$\tan\left(\frac{10\pi}{3}\right) = \frac{-\sqrt{3}}{-1} = \sqrt{3}$$



$$\frac{\pi}{3} \cdot \frac{180}{\pi} = 60^\circ$$

Next time:

harmonic motion and the graphs
of sine & cosine.