

HW WORK
112 FIND EQ. FOR $P(x,y)$ THAT IS SAME DISTANCE FROM $(1,2)$ AND $(3,-4)$

$P(x,y)$ IS A LINE
 NEED SLOPE AND A PT
 MIDPT

- FIND SLOPE OF THE LINE JOINING GIVEN PTS, SAY m
- SLOPE OF THE DESIRE LINE IS $-\frac{1}{m}$

FIND THE MID PT $\left(\frac{1+3}{2}, \frac{2+(-4)}{2}\right) = (2,-1)$

FIND SLOPE OF..... $\frac{\text{RISE}}{\text{RUN}} = \frac{-4-2}{3-1} = \frac{-6}{2} = -3$

So SLOPE OF _____ IS $+\frac{1}{3}$

$m = \frac{\Delta y}{\Delta x}$

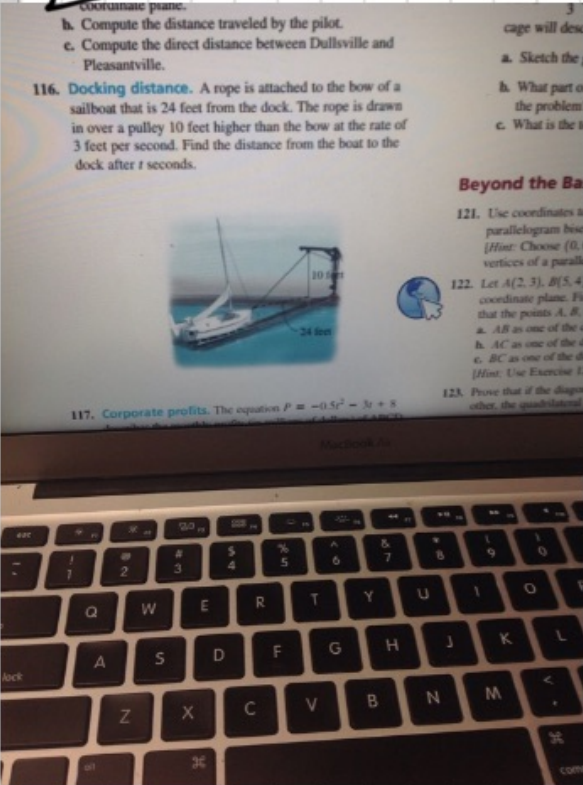
$\frac{1}{3} = \frac{y-(-1)}{x-2}$

$\frac{x-2}{3} = y+1$

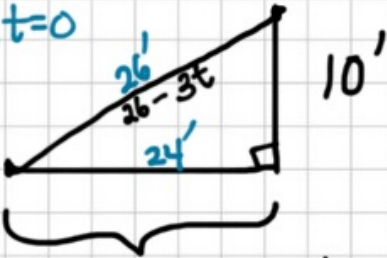
$\frac{x}{3} - \frac{5}{3} = y$

116

116. **Docking distance.** A rope is attached to the bow of a sailboat that is 24 feet from the dock. The rope is drawn in over a pulley 10 feet higher than the bow at the rate of 3 feet per second. Find the distance from the boat to the dock after t seconds.



time $t=0$



$f(t)$ = distance at time t
 Know $f(0) = 24'$

Use PYTHAGORUS

$$(26-3t)^2 = 10^2 + (f(t))^2$$

$$(26-3t)^2 - 100 = (f(t))^2$$

$$\sqrt{(26-3t)^2 - 100} = f(t)$$

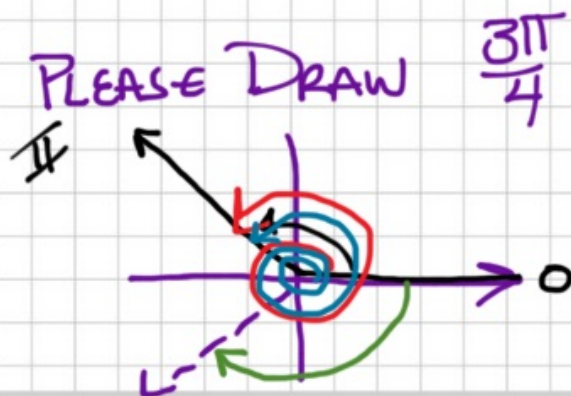
FINAL ANS:

$$f(t) = \sqrt{(26-3t)^2 - 100}$$

WHAT IS A RADIAN?

UNIT OF MEASURE.

MEASURE ANGLES BASED ON DISTANCE ALONG THE UNIT CIRCLE



NOW FIND

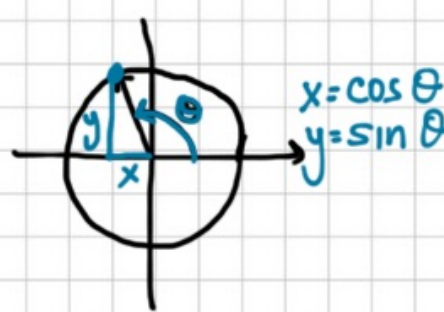
$$1) \cos \frac{3\pi}{4} = -\frac{\sqrt{2}}{2}$$

$$2) \sin \frac{3\pi}{4} = \frac{\sqrt{2}}{2}$$


3) FIND 3 DIFFERENT ANGLES SO THAT $\cos \theta = -\frac{\sqrt{2}}{2}$

$$\frac{-3\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{11\pi}{4}, \frac{13\pi}{4}, \frac{19\pi}{4}$$

4) $\cos \theta < 0$ IN QUAD. II & III.



$x = \cos \theta$
 $y = \sin \theta$



SOHCAHTOA

REST OF TRIG FUNCTIONS

<u>NAME</u>	<u>NOTATION</u>	<u>DEFINITION</u>
TANGENT	tan	$\frac{\sin}{\cos}$
SECANT	sec	$\frac{1}{\cos}$
COSECANT	csc	$\frac{1}{\sin}$
COTANGENT	cot	$\frac{\cos}{\sin}$

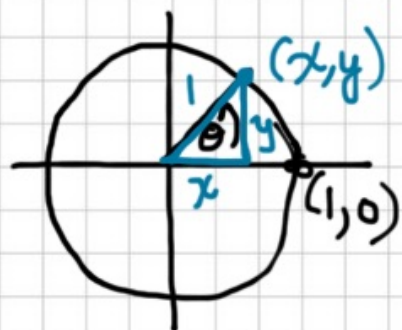
SIN - X
COS - Y
TAN - X/Y
COT - Y/X
SEC - 1/COS
CSC - 1/SIN

QUICK EXAMPLES

FIND $\tan\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}/2}{\sqrt{2}/2} = 1$

FIND $\cot\left(\frac{19\pi}{4}\right) = \frac{\cos(19\pi/4)}{\sin(19\pi/4)} = \frac{-\sqrt{2}/2}{\sqrt{2}/2} = -1$

THE PYTHAGOREAN THEOREM (TRIGIFY)



$$x^2 + y^2 = 1$$

$$(\cos \theta)^2 + (\sin \theta)^2 = 1$$

$$\cos^2 \theta = (\cos \theta)^2$$

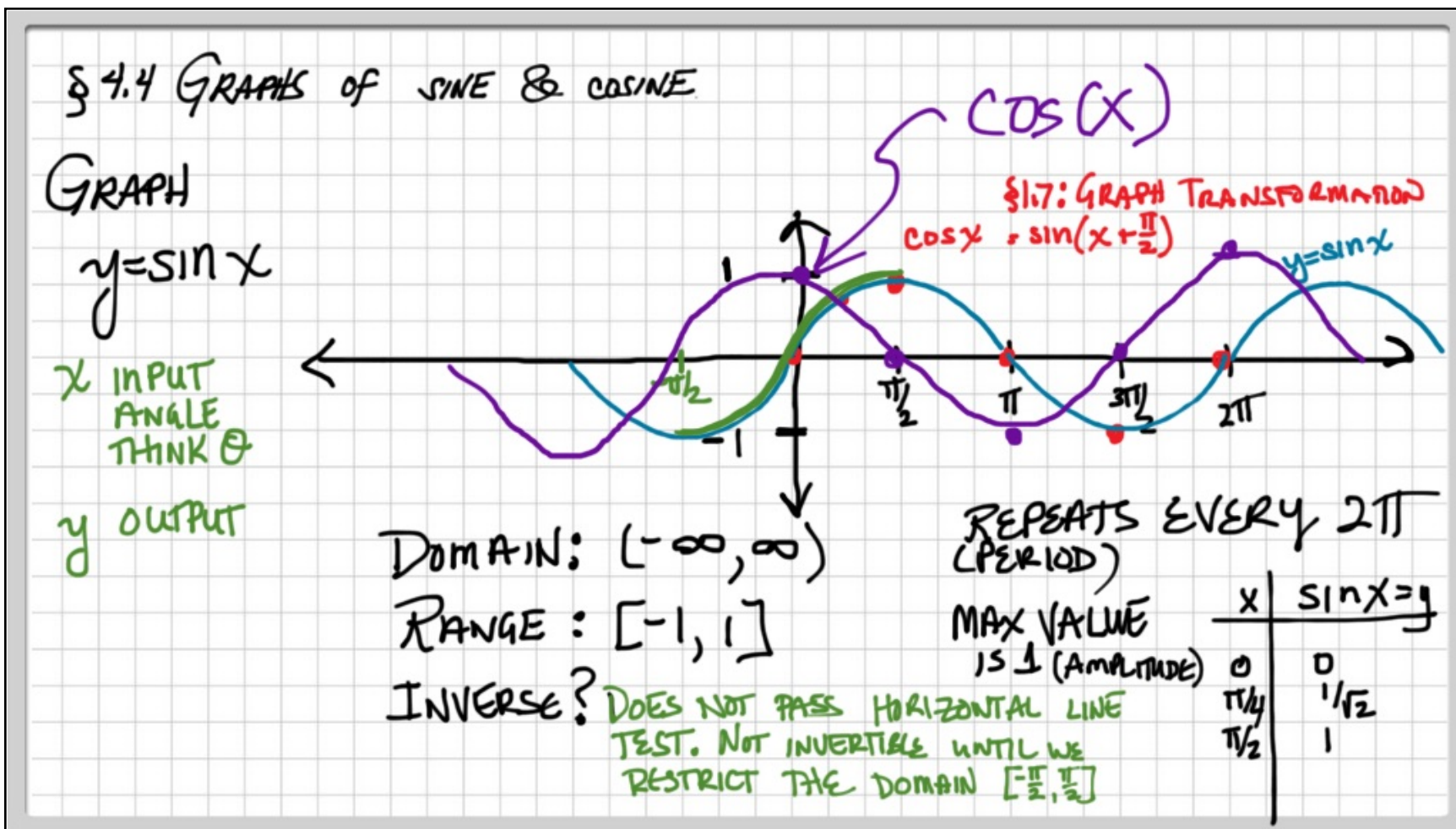
Ex: If $\sin \theta = \frac{3}{5}$ AND $0 < \theta \leq \frac{\pi}{2}$, WHAT IS $\cos \theta$?

USE ♥

$$\begin{aligned} \cos^2 \theta + \left(\frac{3}{5}\right)^2 &= 1 \\ \cos^2 \theta &= 1 - \frac{9}{25} \\ \cos^2 \theta &= \frac{16}{25} \end{aligned}$$

$$\begin{aligned} \cos \theta &= \pm \frac{4}{5} \\ \text{SINCE } 0 < \theta < \frac{\pi}{2}, \theta \text{ IN I} \\ \text{SO COSINE IS +} \\ \cos \theta &= \frac{4}{5} \end{aligned}$$

MINIQUIZ 13



WORK IN GROUPS

ANSWERS TO PAGES 1-3
WRITTEN ON BOARD

STARTED PAGE 4 TOGETHER
WORK ON IT A LITTLE AT HOME—
BE SURE TO REVISIT BEFORE MOVING ON