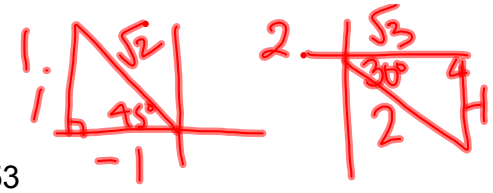
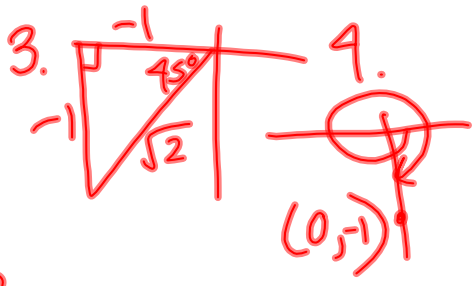
Turn in Homework #2:

Friday - 5.1#83-97 odd
Monday - 5.3 #29-37 odd, 39-70 all
Tuesday - 5.3 #79-82 all; 5.4 #1-23 odd,27,31,45,47,53
Wednesday - 5.5 #7-24 all

$2\pi \cdot \frac{6}{6} = \frac{12\pi}{6}$

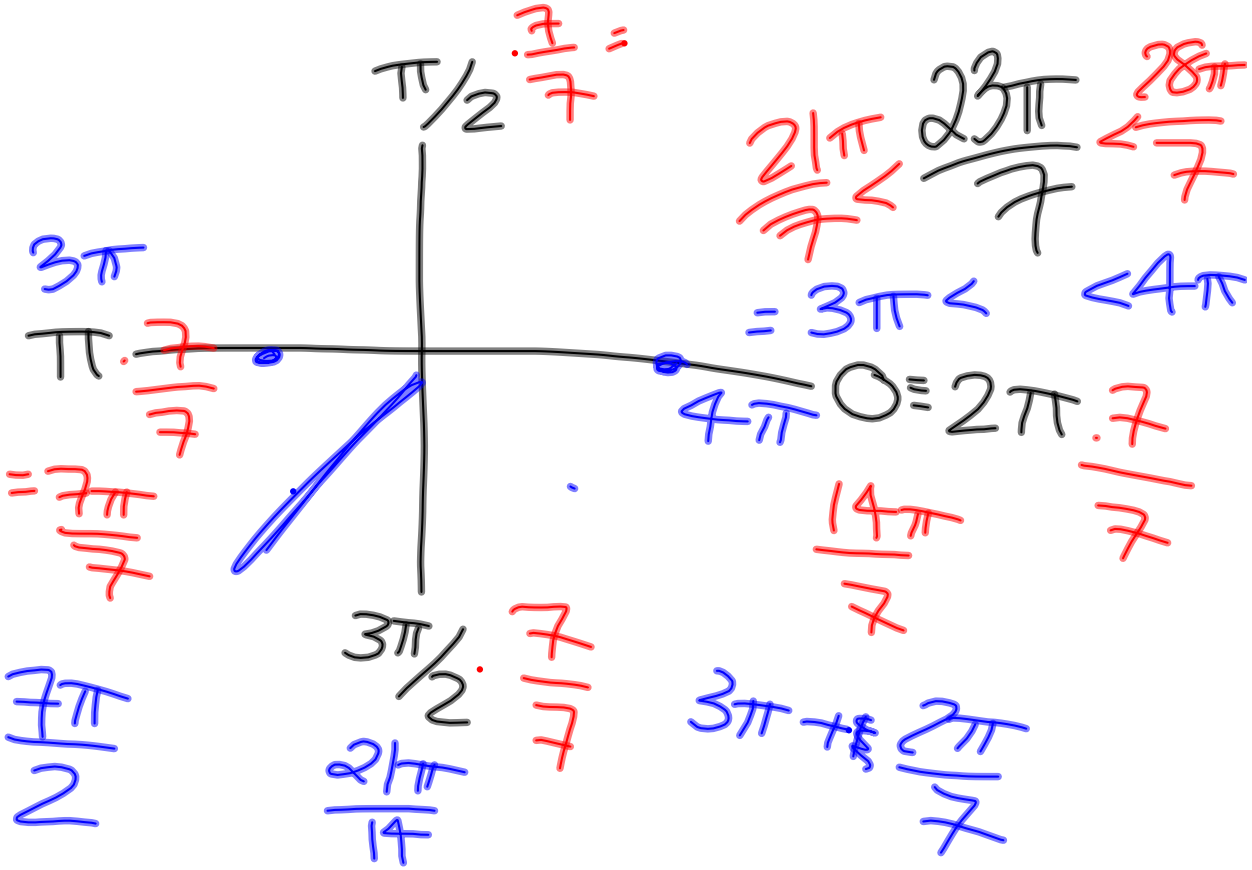




Review:

Evaluate the following:

1. $\sin 135° = \frac{1}{\sqrt{2}}$
2. $\tan \frac{11\pi}{6} = \frac{-1}{\sqrt{3}}$
3. $\csc \frac{5\pi}{4} = -\sqrt{2}$
4. $\cot(-450°) = 0$
5. $\cos \frac{2\pi}{3} = \frac{-1}{2}$
6. $\cos 53\pi = -1$

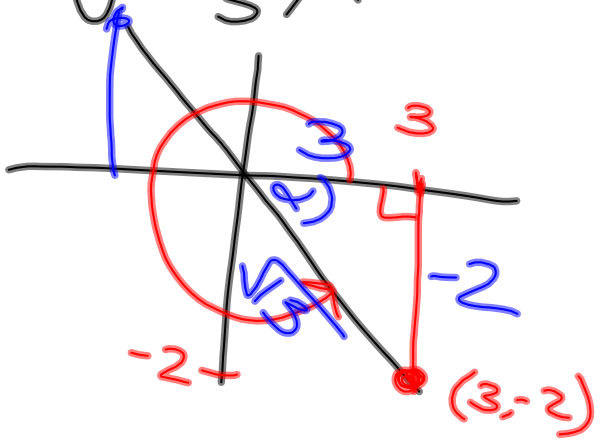


Homework questions?

$2x+3y=0$; IV

$3y=-2x$

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



$115.3°$

coterminal $\angle$'s

$+360° = 475.3°$

$+360° =$

$-360° =$

$-360° =$

$\frac{3\pi}{5} \equiv \frac{13\pi}{5} = \frac{23\pi}{5} = \frac{-7\pi}{5}$

$+2\pi \cdot \frac{5}{5} = \frac{10\pi}{5}$

$+4\pi$

Linear Speed

$$v = \frac{s}{t}$$

Angular Speed

$$\omega = \frac{\theta}{t}$$

Arc Length

$$s = r\theta$$

Relating Linear & Angular Speed

$$V = r\omega$$

r = radius or distance from the center of rotation $(in, cm, km, etc.)$

s = arc length or linear distance along the circumference of a circle $(in, cm, km, etc.)$

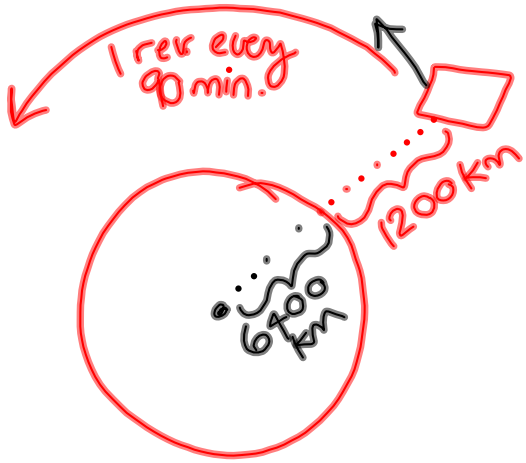
θ = angle or amount of rotation $(deg, rad, revolutions, etc.)$

t = time $(sec, min, hours, years, etc.)$

$v = \frac{\text{linear distance}}{\text{time}}$ = linear speed $\left(\frac{km}{s}, \frac{mi}{h}, etc.\right)$

$\omega = \frac{\text{amount of rotation}}{\text{time}}$ = angular speed $\left(\frac{rev}{min}, \frac{deg}{s}, etc.\right)$

2. An earth satellite in circular orbit 1200 km high makes one complete revolution every 90 minutes. What is its linear speed in km/min, given that the earth's radius is 6400 km?



$r = 6400 + 1200 = 7600$ km

$\omega = \frac{1 \text{ rev}}{90 \text{ min}}$

$V = ?$ km/min

$V = r\omega$

$$V = \frac{7600 \text{ km}}{1} \cdot \frac{1 \text{ rev}}{90 \text{ min}} \cdot \frac{2\pi}{1 \text{ rev}} = \frac{1520\pi}{9} \frac{\text{km}}{\text{min}}$$

3. Through how many radians does the minute hand of a clock rotate from 12:45pm to 1:25pm?

$\theta = ?\ \text{rad}\ ;\ t = 40\ \text{min}\ ;\ \omega = \frac{1\ \text{rev}}{60\ \text{min}}$

$t\omega = \frac{\theta}{t} \cdot t$

$\theta = \omega t = \frac{1\ \text{rev}}{60\ \text{min}} \cdot \frac{40\ \text{min}}{1} \cdot \frac{2\pi}{1\ \text{rev}} = \frac{4\pi}{3}$

4. A car travels at 60 miles per hour. Its wheels have a 24 inch diameter. What is the angular speed of a point on the rim of a wheel in revolutions per minute?

$v = 60\ \text{mi/h}\ ;\ r = 12\ \text{in}\ ;\ \omega = ?\ \text{rev/min}$

$\frac{v}{r} = \frac{r\omega}{r}$ $\quad \omega = \frac{v}{r} = \frac{v}{1} \cdot \frac{1}{r}$

$\omega = \frac{60\ \text{mi}}{\text{h}} \cdot \frac{1}{12\ \text{in}} \cdot \frac{1\ \text{h}}{60\ \text{min}} \cdot \frac{2640}{1\ \text{mi}} \cdot \frac{12\ \text{in}}{1\ \text{ft}} \cdot \frac{1\ \text{rev}}{2\pi}$

$= \frac{2640}{\pi}\ \text{rev/min}$

Homework:

Five problems on handout and 5.4#61-79*odd

*note that the answer to #79 in your textbook is incorrect.
the correct answer is ~119 radians.