Online graphing calculator:

http://www.meta-calculator.com/online/

Errata on homework

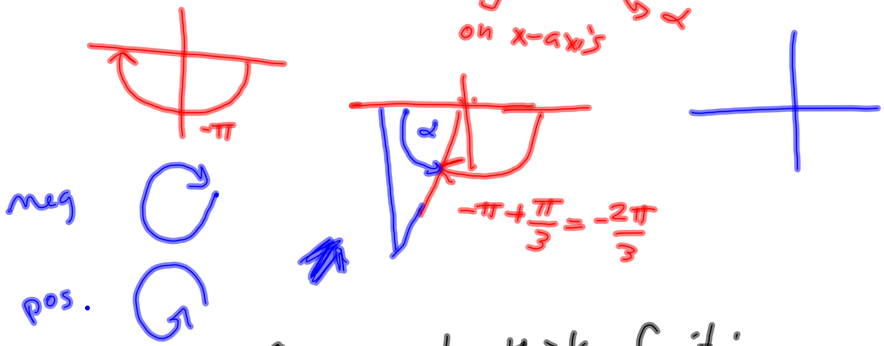
#s 13b & 63

#13b Look for nearest multiple of π, because your reference angle is always measured from the x-axis → α

13b should be $\theta = -\frac{2\pi}{3}$

$-\frac{2\pi}{3} = -\frac{3\pi}{3} + \frac{\pi}{3} = \frac{-\pi}{} + \frac{\pi}{3}$

($-\pi$ → on x-axis; $\frac{\pi}{3}$ → α)



One way to think of it:

Go $+\frac{2\pi}{3}$ & flip it over the x-axis.

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

Flip it:

#63 - I miscopied 5000 as 500.

Final answer is 9490.227808 ft/min

No reason to go to feet. EXCELLENT.

Extra: miles/hr:

$$(9490)\left(\frac{ft}{min}\right)\left(\frac{1\ mi}{5280\ ft}\right)\left(\frac{60\ min}{1\ hr}\right)$$

$$\frac{9490 \cdot 60}{5280}$$

$$\frac{4745}{44}$$

$evalf(\%)$

107.8409091 !?

108 $\frac{miles}{hr}$!?

Area of Sector of a circle.

I think of it always working proportional to a full circle.

Area of a disc $= \pi r^2$

Angle to go all the way around $= 2\pi$

Area of disc in terms of the angle:

$$\pi r^2 = \frac{1}{2} \cdot 2\pi r^2 \quad (2\pi \to \theta)$$

$\frac{1}{2}$-way around the circle:

$$\frac{\frac{1}{2}(2\pi r^2)}{2} = \frac{1}{2}(\pi r^2) \quad (\pi \to \theta)$$

$\frac{1}{3}$ around

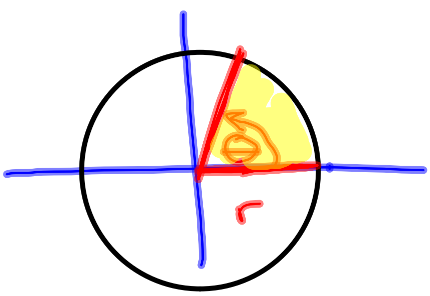
$$\frac{\pi r^2}{3} \qquad \frac{\frac{1}{2}(2\pi r^2)}{3} = \frac{1}{2}\left(\frac{2\pi}{3} r^2\right)$$

$\frac{2\pi}{3} \to \theta$ for $\frac{1}{3}$ way around

⋮

In general, Area $= \frac{1}{2}\theta r^2$

$= \frac{1}{2} r^2 \theta$

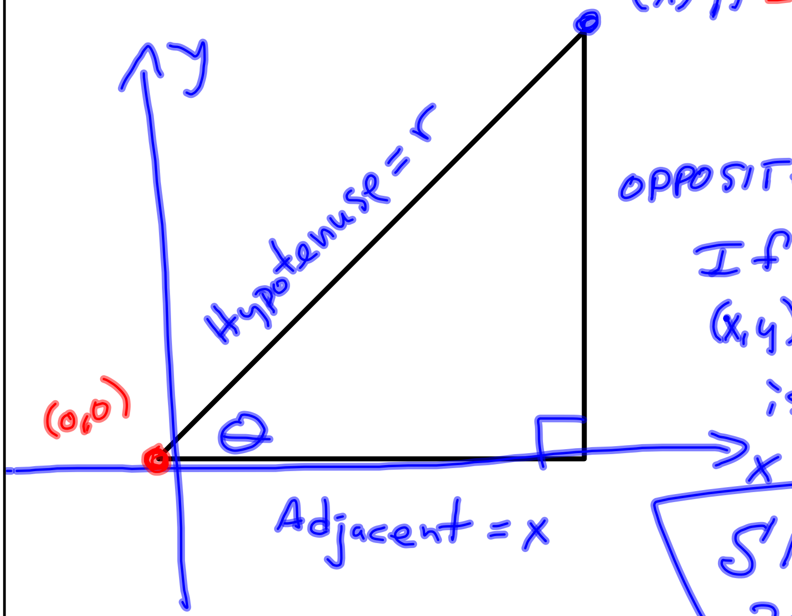


Area $= \frac{1}{2} r^2 \theta$

θ has to be in radians for this to work.

Today, we define trig functions.

$(x, y) = (r\cos\theta, r\sin\theta)$



OPPOSITE = y

If $r = 1$, then $(x, y) = (\cos\theta, \sin\theta)$ is §1.2.

§1.2 ~~#s~~
2-5 all, 7-49 odds

$$\sin\theta = \frac{\text{OPPOSITE}}{\text{Hypotenuse}} = \frac{y}{r}$$

$$\cos\theta = \frac{\text{ADJACENT}}{\text{HYPOTENUSE}} = \frac{x}{r}$$

$$\tan\theta = \frac{\text{OPPOSITE}}{\text{ADJACENT}} = \frac{y}{x} = \text{Slope!}$$

$\Longrightarrow$ $r\sin\theta = y$

$y = r\sin\theta$

&, $x = r\cos\theta$