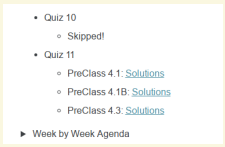
Quiz #11 Review

⚠ Use these notes for the quiz!

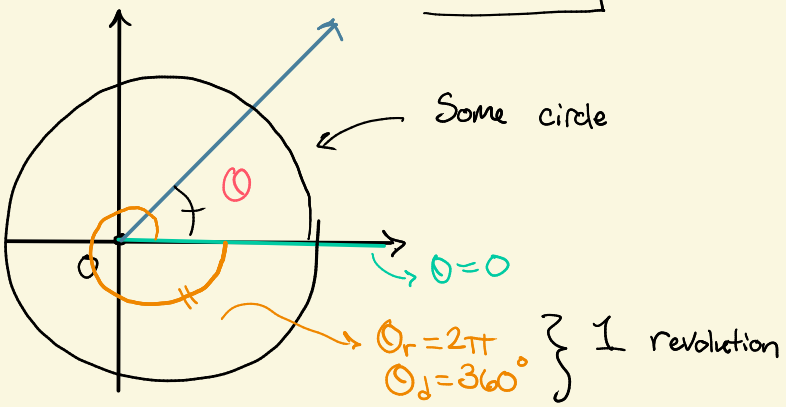

- Quiz 10
  - Skipped!
- Quiz 11
  - PreClass 4.1: Solutions
  - PreClass 4.1B: Solutions
  - PreClass 4.3: Solutions
- ▸ Week by Week Agenda

- Relations > Formulas!
- Converting bw degrees & radians

θ_d ↑ ↑ θ_r

preferable!

⚠ Most formulas require radians ($\theta = \theta_r$)



$$\left[\frac{\theta_d}{360} = \frac{\theta_r}{2\pi}\right]$$

How to use?

Ex $\theta_d = 30°$ (degrees)

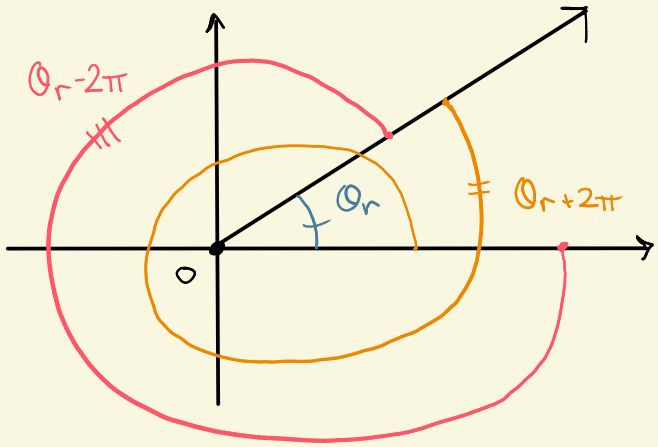
$$2\pi\left(\frac{\theta_d}{360}\right) = \theta_r \Rightarrow \theta_r = \left(\frac{\pi}{180}\right)\theta_d$$

$$\Rightarrow \theta_r = 2\pi\left(\frac{30°}{360°}\right) = ?$$

- "Coterminal" angles

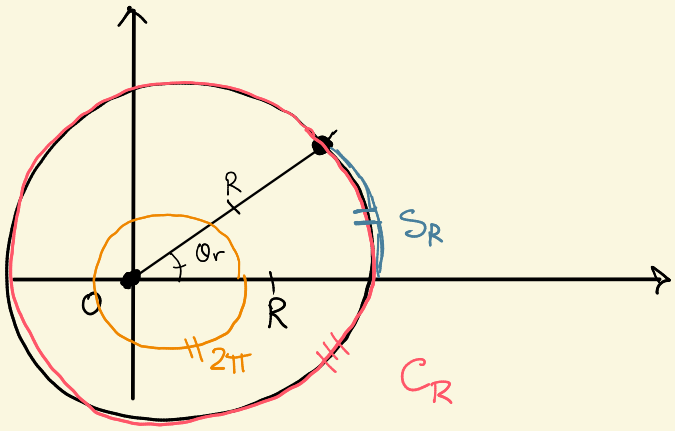
Vocab!

$\theta_r \cong \theta_r + 2k\pi$ for any $k \in \mathbb{Z}$



- Relating angles to arc lengths

⚠ Common mistake: using θ_d instead of θ_r!



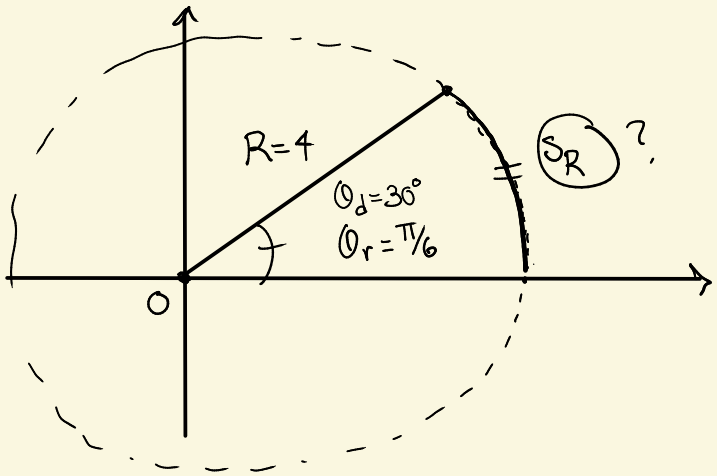
$$\frac{\theta_r}{2\pi} = \frac{s_R}{2\pi R}$$

Ex: Given $\theta = 30°$, $R = 4$, what is the arc length?

0) Draw a picture!

1) Convert to radians $\rightarrow$ $\theta_r = \pi/6$

2) Write the relation



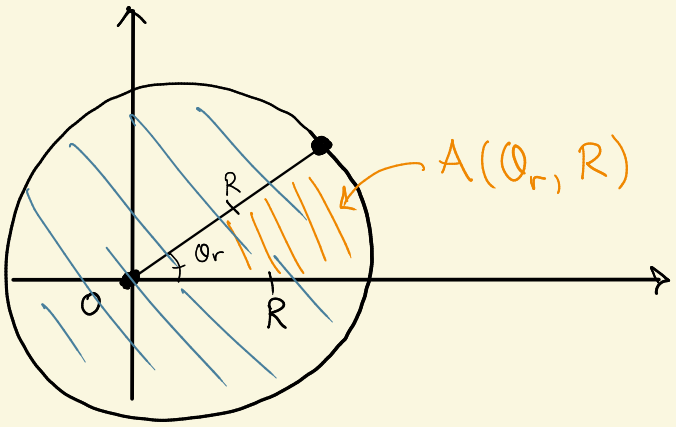
$$\frac{\theta_r}{2\pi} = \frac{s_R}{2\pi R} \Rightarrow s_R = \left(\frac{\theta_R}{2\pi}\right) \cdot 2\pi R$$

$$s_R = \theta_R \cdot R$$

$$= (\pi/6) \cdot 4$$

$$\Rightarrow s_R = 2\pi/3.$$

- Areas of sectors



$$\frac{\theta_r}{2\pi} = \frac{A(\theta_r, R)}{A(2\pi, R)}$$

← Area of the sector

← Area of the entire circle

We know $A(2\pi, R) = \pi R^2$

Double check!

$$\Rightarrow \frac{\theta_r}{2\pi} = \frac{A(\theta_r, R)}{\pi R^2} \rightarrow A = \pi R^2 \left(\frac{\theta_R}{2\pi}\right) = \frac{1}{2}\theta_R R^2$$

- To think about
  - Polar coordinates
  - Vectors
  - Soh-Cah-Toa (Cho-Sha-Cao)
    - sine = $\frac{\text{opp}}{\text{hyp}}$
    - csc, sec, cot
  - "Special" angles: $0, \pi/6, \pi/2, \pi/3, \pi/2$
    their sines/cosines