

Quiz #11 Review

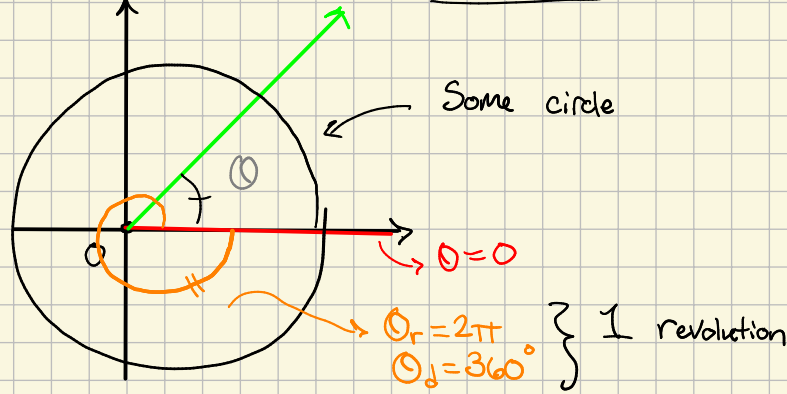
⚠ Use these notes for the quiz!

- 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 $\underline{\theta_d} = 30^\circ$ (degrees)

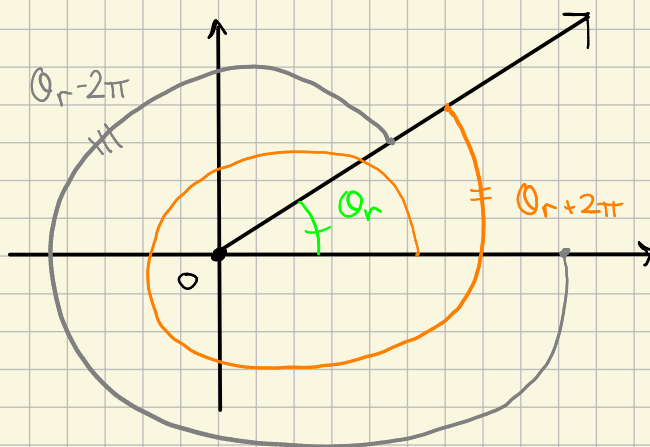
$$2\pi \left(\frac{\theta_d}{360} \right) = \theta_r \quad \left. \vphantom{2\pi} \right\} \theta_r = \left(\frac{\pi}{180} \right) \theta_d$$

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

• "Coterminal" angles

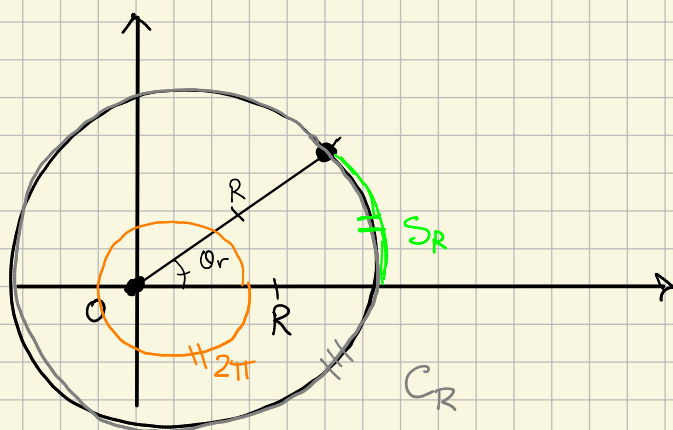
Vocab!

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



• Relating angles to arc lengths

\triangle Common mistake: using θ_d instead of θ_r !



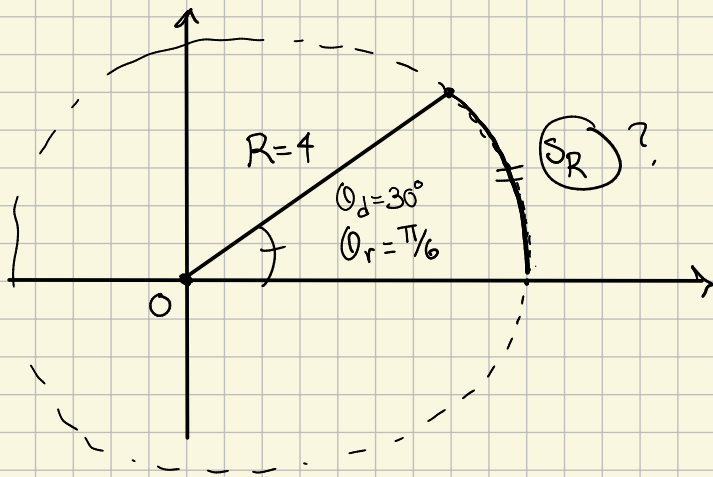
$$\boxed{\frac{\theta_r}{2\pi} = \frac{s_r}{2\pi R}}$$

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

0) Draw a picture!

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

2) Write the relation

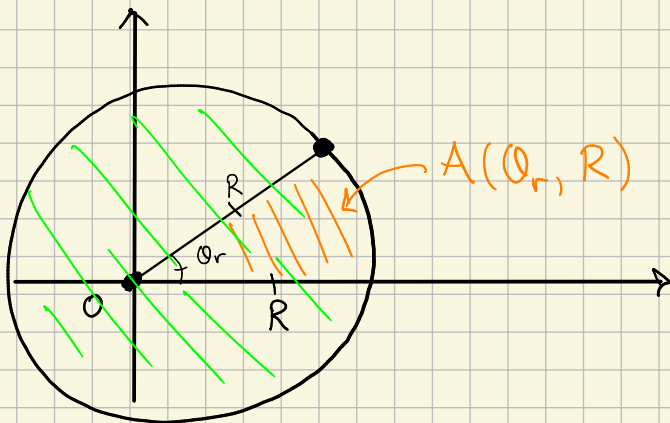


$$\frac{\theta_r}{2\pi} = \frac{S_R}{2\pi R} \Rightarrow S_R = \left(\frac{\theta_r}{2\pi}\right) \cdot 2\pi R$$

$$S_R = \theta_r \cdot R = (\pi/6) \cdot 4$$

$$\Rightarrow S_R = 2\pi/3$$

• 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