Lecture 16

Friday, February 16, 2024 12:16 PM

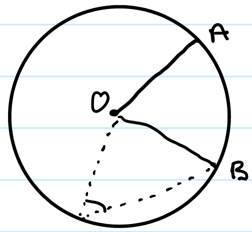
The Assignment Plan:

Assignment #5 - due this friday (take extra time if needed)

Assignment #2e - live on friday, due Feb, 26th

Assignment #6 - live on Feb 23rd, due March 1st

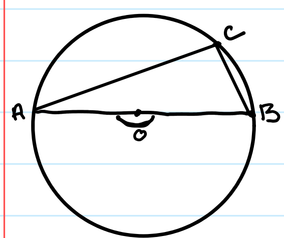
Thales Theorem / Angle/side lengths propositions



A central angle is twice the corresponding circumferential angle. Assignment #5 (III-203)

Corollary: Given a chord, all the "inscribed" angles from the same are subtended by the chord are equal.

Thale's Theorem:

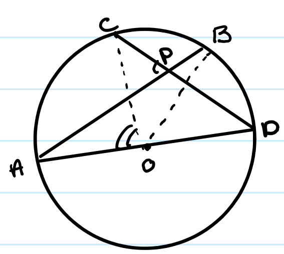


The triangle formed by a diameter and any other point on the circle is right.

Proof $\angle ACB = \frac{1}{2}\angle AOB$

$= \frac{1}{2}$ ⌓ $= ∟$

Proposition



$* \measuredangle = 2∟ =$ ⌓

Suppose chords AB and CD of a circle intersects at P, then $\angle APC = \frac{1}{2}\angle AOC + \frac{1}{2}\angle BOD$

Proof

$\angle APC$?

Proof

$\angle APC$?

$\angle ADC = \frac{1}{2}\angle AOC$

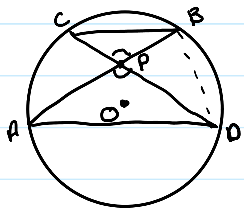
$\angle BAD = \frac{1}{2}\angle BOD$

connect A to D to make ΔADP. Then the external $\angle APC = \angle PAD + \angle PDA$

$= \angle BAD + \angle ADC$

$= \frac{1}{2}\angle AOC + \frac{1}{2}\angle BOD$ //

Proposition Suppose chords AB and CD meet at P inside the circle, then $|PA|\cdot|PB| = |PC|\cdot|PD|$



Proof connect B to C and A to D to make ΔPBC and ΔPAD

$\angle BPC = \angle APD$ (opposite angles)

$\angle ABC = \angle ADC$ (Subtend the same chord of AC)

$\angle PBC = \angle ADP$

By angle-angle similarity $\Delta PBC \sim \Delta PDA$

$\Rightarrow \frac{|PB|}{|PD|} = \frac{|PC|}{|PA|}$ cross multiply $\Rightarrow |PA|\cdot|PB| = |PC|\cdot|PD|$ //