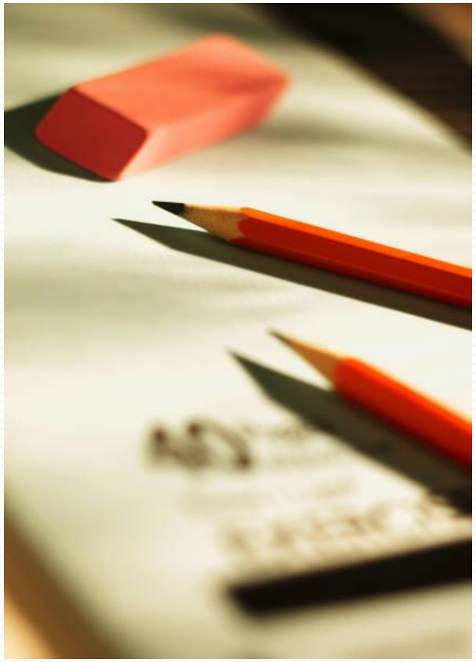
CPCTC and Circles

Advanced Geometry

3.3

Objective

- To write proofs involving congruent triangles and CPCTC.



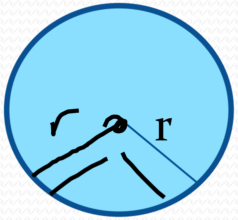
CPCTC

- **C**orresponding
- **P**arts of
- **C**ongruent
- **T**riangles are
- **C**ongruent

Circles Review

- What is the formula for the area of a circle?

$$A = \pi r^2$$



- What is the formula for the circumference of a circle?

$$C = 2\pi r$$

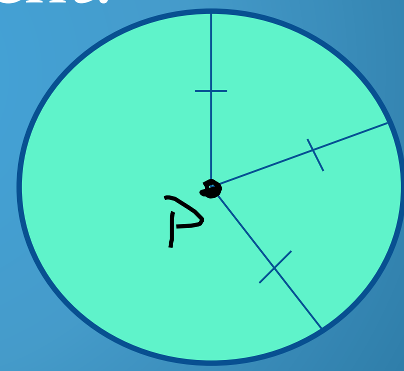
- π≈ 3.141592654

Theorem

All radii of a circle are congruent.

Given: $\odot P$

Circle P



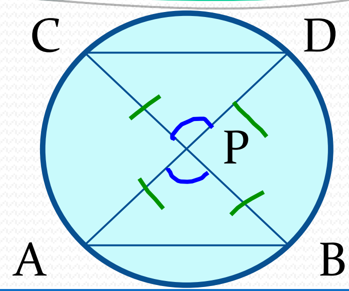
Proof Tips

- FIRST prove two triangles congruent using SSS, SAS, ASA, or AAS.
  - In addition to using the reflexive property, perpendicular segments that form right angles and bisected angles/segments that are congruent, look for **radii** *(all radii of a circle are congruent)*
  - The segments/angles you are trying to prove congruent will be parts of the triangles you prove congruent.

- Use CPCTC ***after*** you prove the triangles congruent.

Given: Circle P

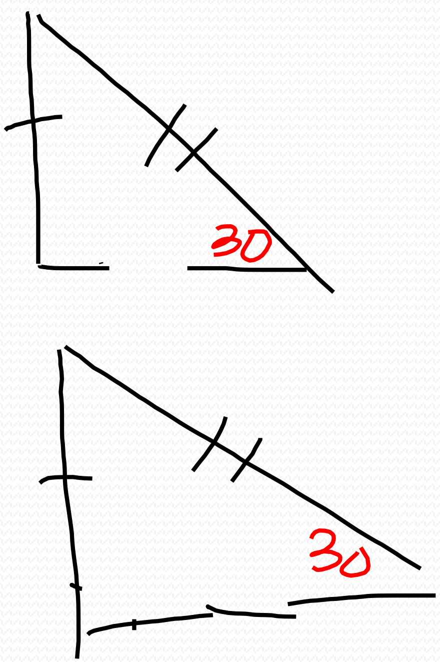
Prove: $\overline{AB} \cong \overline{CD}$.



Statements	Reasons
1. Circle P	1. Given
2. $\overline{PA} \cong \overline{PB} \cong \overline{PC} \cong \overline{PD}$	2. All radii of a circle are congruent
3. $\angle CPD \cong \angle APB$	3. Vertical angles are congruent
4.	4. SAS
5. $\overline{AB} \cong \overline{CD}$	5. CPCTC

Another Example

- Read Sample Problem 2 on page 126

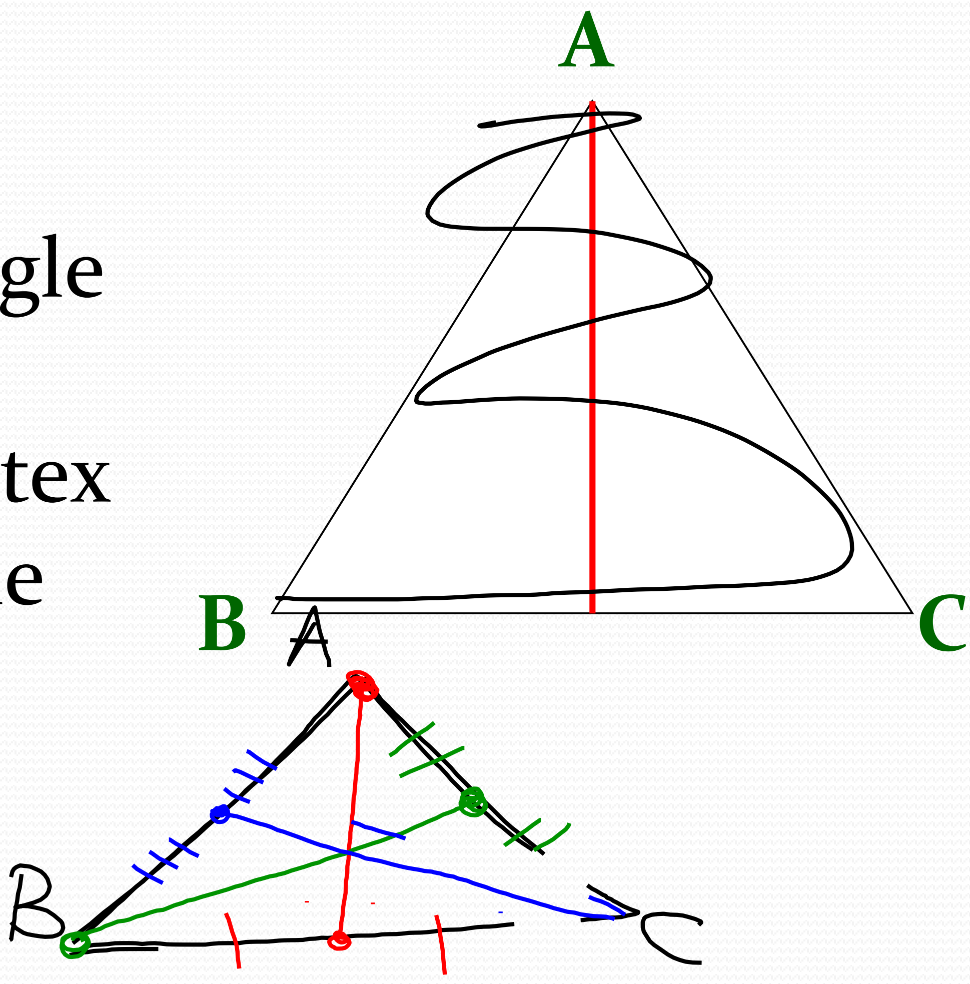


Section 3.4

Beyond CPCTC

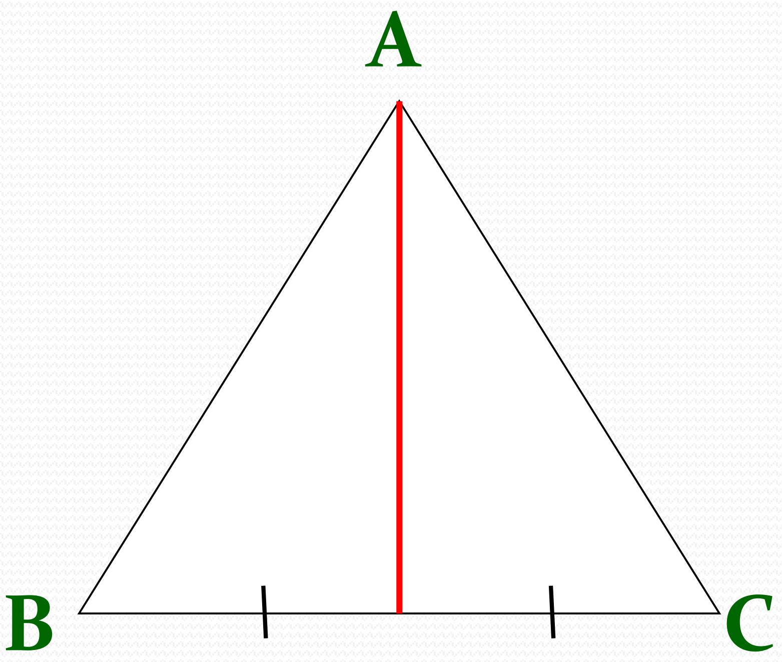
<u>Median</u>

- A <u>median</u> of a triangle is a line segment drawn from any vertex of the triangle to the midpoint of the opposite side.



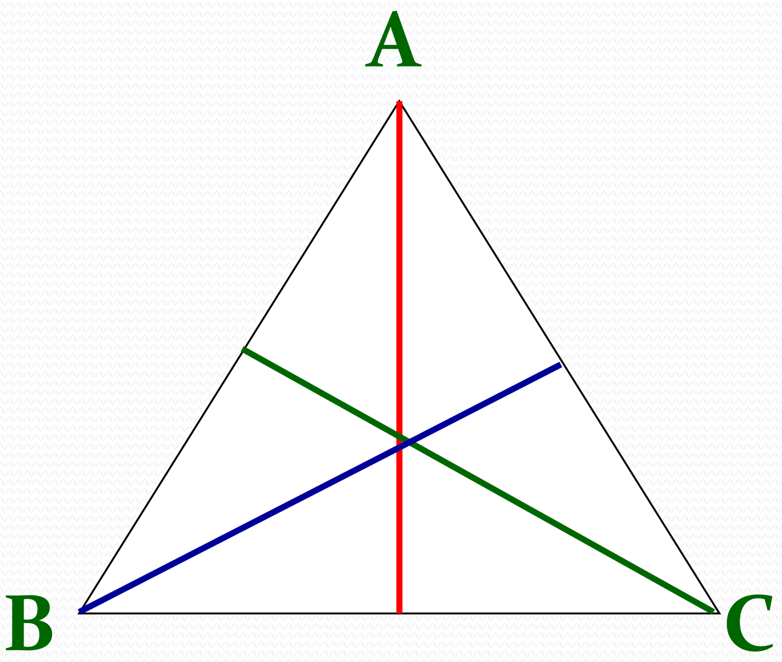
Median

- A median divides the opposite side into two congruent segments, or bisects the side to which it is drawn.



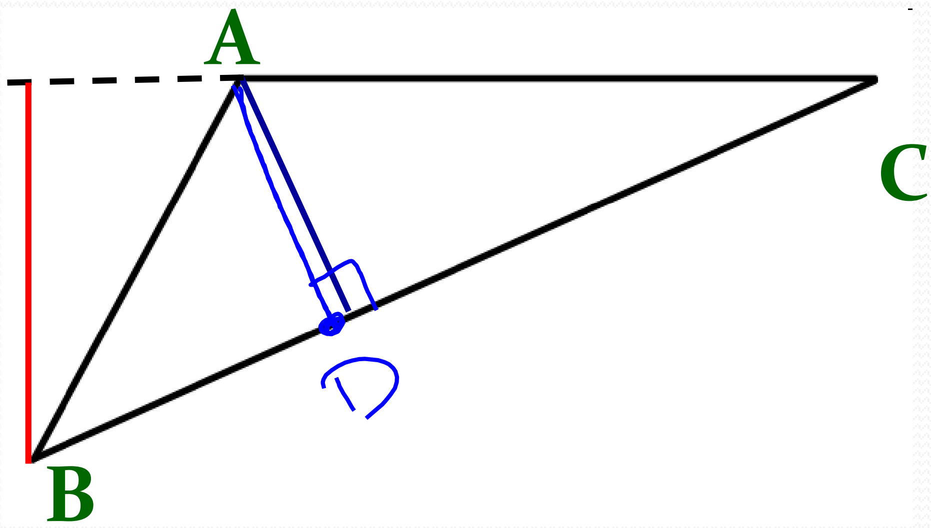
Median

- ***Every*** triangle has three medians.



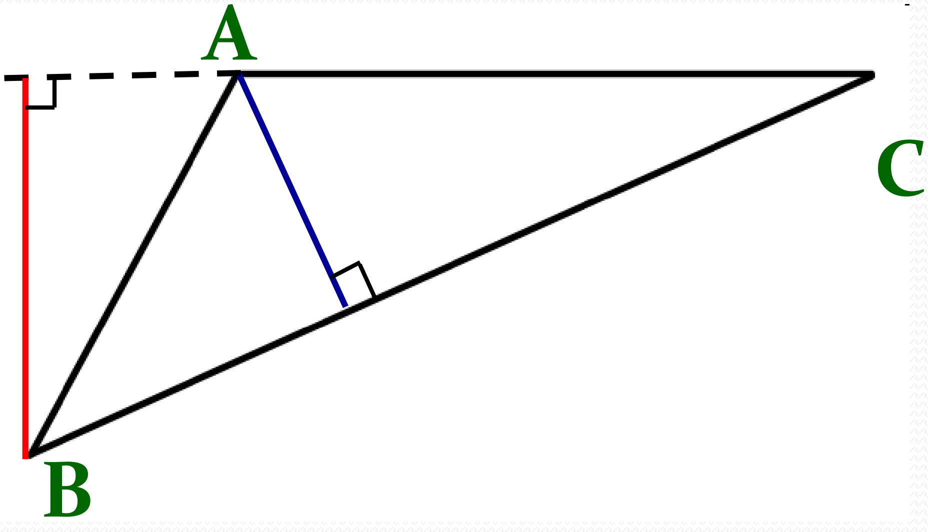
Altitude

- An altitude of a triangle is a line segment drawn from any vertex of the triangle to the opposite side, extended if necessary, and perpendicular to that side.



Altitude

- An altitude of a triangle forms a right angle with the side to which it is drawn.



Altitude

- Every triangle has three altitudes.