

3. (Ruler axiom) The points on a line could be paired with real numbers in such a way that

- a) Any desired points could be 0
- b) the distance between points paired with x and y equals $|x-y|$

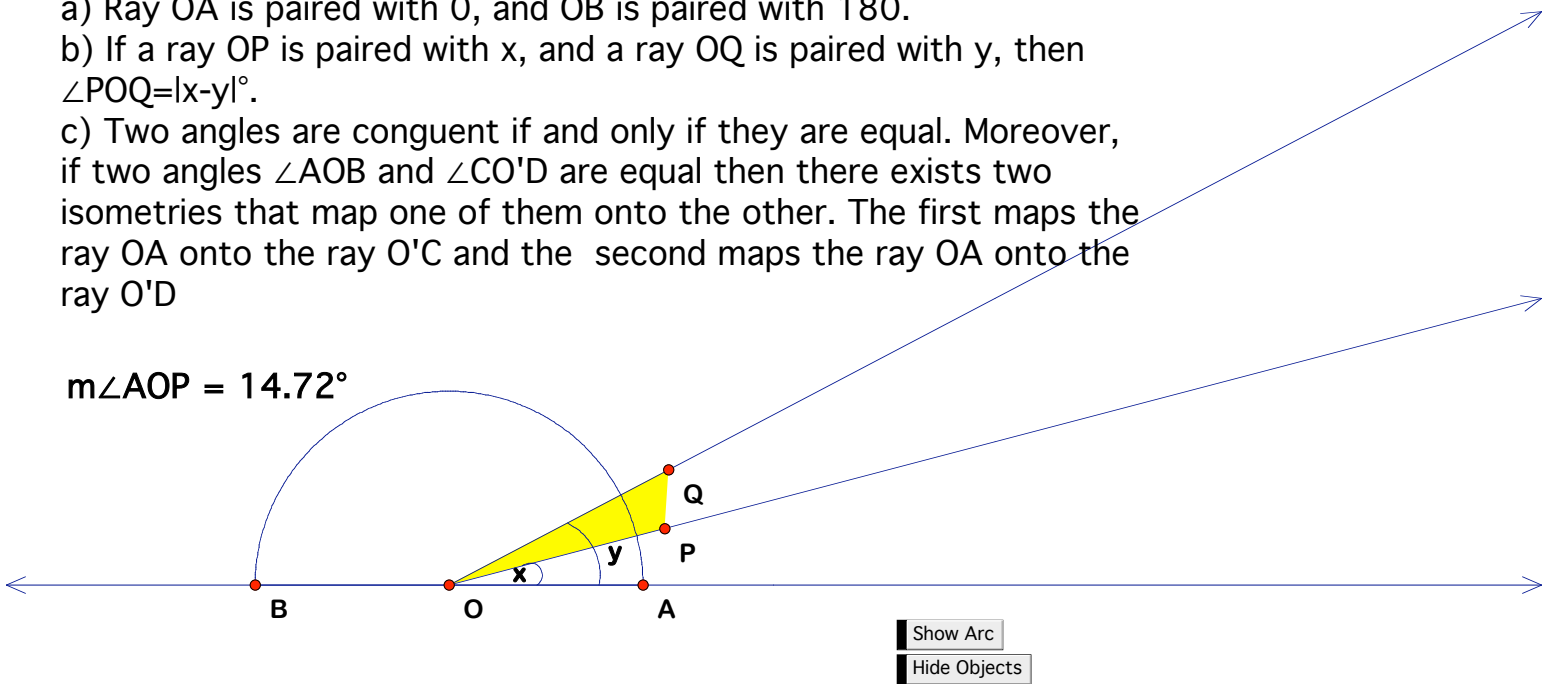
Theorem 15 (Protactor postulate). Select a line AB and choose any point O between A and B .

Consider the rays OA and OB and all rays that can be drawn from O on one side of the line AB .

These rays can be paired with the real numbers from 0 to 180 in such a way that:

- a) Ray OA is paired with 0 , and OB is paired with 180 .
- b) If a ray OP is paired with x , and a ray OQ is paired with y , then $\angle POQ = |x-y|^\circ$.
- c) Two angles are congruent if and only if they are equal. Moreover, if two angles $\angle AOB$ and $\angle CO'D$ are equal then there exists two isometries that map one of them onto the other. The first maps the ray OA onto the ray $O'C$ and the second maps the ray OA onto the ray $O'D$

$m\angle AOP = 14.72^\circ$



- Ruler axiom
- Protractor Axiom
- Isoseles
- Picture for Protractor

Corollary 15.1 (from Theorem 15).

For any given angle x and ray OA , there are exist only two rays OX such that $\angle AOX = x$. They lay in different halfplanes with line OA as the boundary.

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