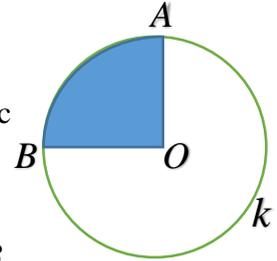


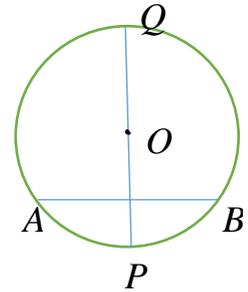
Geometry

Central angle and the defined arc: An angle which has its vertex at the center of a circle and which rays are radii of the circle is called a central angle. The arc enclosed by this angle has the same measure as the angle:
 $\angle AOB = 45^\circ$, $\text{arc } \widehat{AB} = 45 \text{ arc}^\circ$ (arc degrees).



Diameter perpendicular to a chord: If $k(O, r)$ is a circle in which the chord AB is perpendicular to the diameter PQ , then the diameter is also a bisector of AB , e.g. point $M = PQ \cap AB$ is a midpoint of AB , $AM = MB$.

The opposite is also true, if the diameter is a bisector of a chord AB , then the diameter is perpendicular to the chord, $PQ \perp AB$.

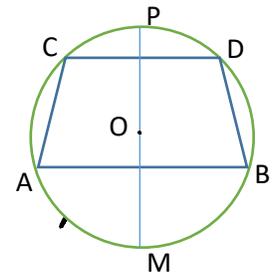


Homework

1. Two concentric circles, where the circles have the same center and one has a larger radius, are crossed by a line at consecutive points A, B, C, and D. Prove that $AB = CD$.

2. On the figure AB and CD are parallel chords in the circle where the diameter PM is perpendicular to them. (Note that parts a), b), and c) are independent.)

- a) Prove that $AC = BD$. [Hint: draw a triangle connecting A, B and the middle of chord CD. What type of a triangle is this? Can you prove that its neighboring triangles are congruent?
- b) If the radius $r = 5$ cm and the chord $AB = 8$ cm, find the area of $\triangle AOB$.
- c) If $\angle OAB = 15^\circ$, how big are the arcs \widehat{AM} (with one check mark) and \widehat{ACP}



3. In a circle the chords AB and CD are intersecting and are perpendicular to each other. AB splits CD in segments with size 3 cm and 7 cm. Find the distance from the center of the circle to the chord AB (the distance is a line perpendicular to AB).