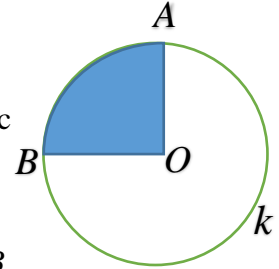


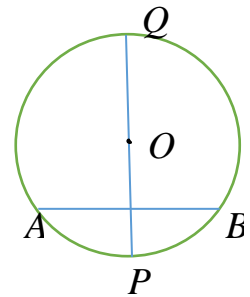
Geometry

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:
 $\angle AOB = 45^\circ$, $\text{arc } \overset{\frown}{AB} = 45 \text{ arc}^\circ$ (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, $PQ \perp AB$.

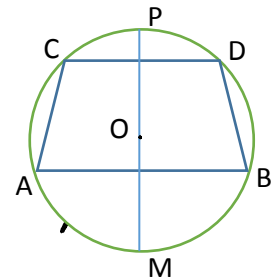


Homework

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 $AB = CD$. Please, do this problem again but this time draw the line smaller than the diameter.

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 $\overset{\frown}{AM}$ (with one check mark) and $\overset{\frown}{ACP}$



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).