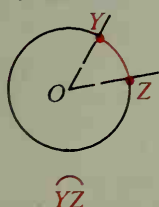


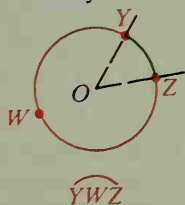
9-3 Arcs and Central Angles

A **central angle** of a circle is an angle with its vertex at the center of the circle. In the diagrams below, $\angle YOZ$ is a central angle. An **arc** is an unbroken part of a circle. Two points Y and Z on a circle O are always the endpoints of two arcs. Y and Z and the points of $\odot O$ in the interior of $\angle YOZ$ form a **minor arc**. Y and Z and the remaining points of $\odot O$ form a **major arc**. If Y and Z are the endpoints of a diameter, then the two arcs are called **semicircles**. A minor arc is named by its endpoints: \widehat{YZ} is read "arc YZ ." You use three letters to name a semicircle or a major arc: \widehat{YWZ} is read "arc YWZ ."

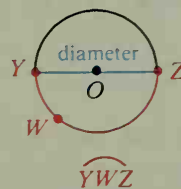
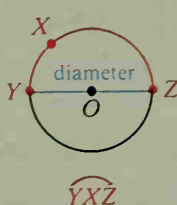
Minor Arc



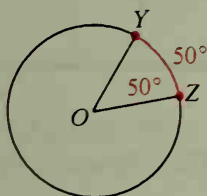
Major Arc



Semicircles

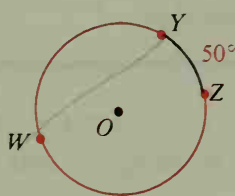


The **measure of a minor arc** is defined to be the measure of its central angle. In the diagram at the left below, $m\widehat{YZ}$ represents the measure of minor arc YZ . In the middle diagram, can you see why the **measure of a major arc** is 360 minus the measure of its minor arc? The third diagram shows that the **measure of a semicircle** is 180.



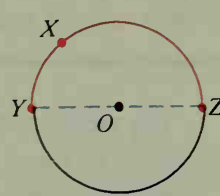
Minor Arc

$$\begin{aligned} m\widehat{YZ} &= m\angle YOZ \\ &= 50 \end{aligned}$$



Major Arc

$$\begin{aligned} m\widehat{YWZ} &= 360 - m\widehat{YZ} \\ &= 360 - 50 = 310 \end{aligned}$$



Semicircle

$$m\widehat{YXZ} = 180$$

Adjacent arcs of a circle are arcs that have exactly one point in common. The following postulate can be used to find the measure of an arc formed by two adjacent arcs.

Postulate 16 Arc Addition Postulate

The measure of the arc formed by two adjacent arcs is the sum of the measures of these two arcs.