

Circles – Central Angles

Notes Section 12.3

G.C.A.2

Arc: an unbroken part of a circle.

- Minor Arc: an arc that measures less than 180.
- Major Arc: an arc that measures more than 180.
- Semicircle: an arc that measures 180.

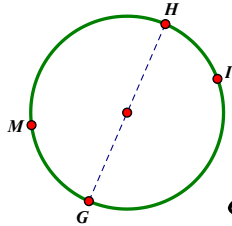
Name _____

Adjacent Arcs: arcs of a circle that have exactly one point in common.

\widehat{HI} and \widehat{GI} are adjacent

Minor Arc

\widehat{MG} , \widehat{MH}
 \widehat{HI} , \widehat{MG}

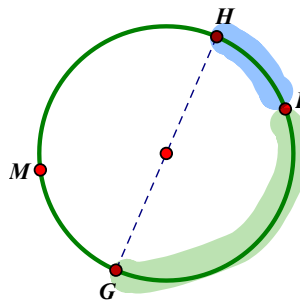


Major Arc

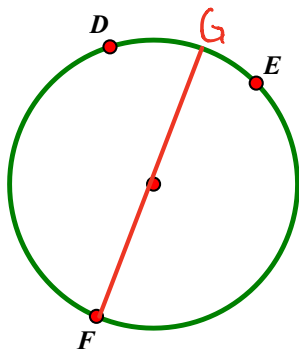
\widehat{MBI} , \widehat{MHG}

Semicircle

\widehat{GMH} , \widehat{GIH}



Name each of the following from the picture.



Minor Arc

\widehat{FD}
 \widehat{DE}
 \widehat{EF}

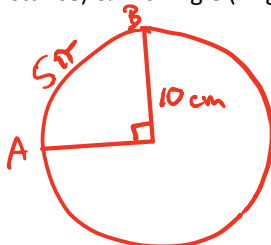
Major Arc

\widehat{FDE}
 \widehat{DEF}

Semicircle

\widehat{FDG}
 \widehat{FEG}

Arc Length (Distance) & Arc Angle (Angle Measure)



Length

$$C = 2\pi r$$

$$= 2(10)\pi$$

$$C = 20\pi \text{ cm}$$

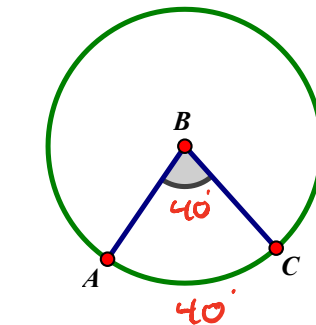
$$\text{length } \widehat{AB} = \frac{90}{360} (20\pi \text{ cm})$$

$$= \frac{1}{4} (20\pi \text{ cm})$$

$$\text{length } \widehat{AB} = 5\pi \text{ cm}$$

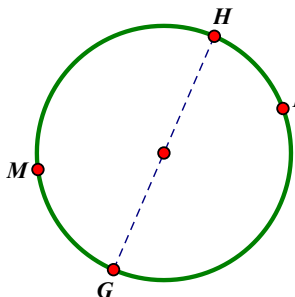
Angle measure

$$m\widehat{AB} = 90^\circ$$



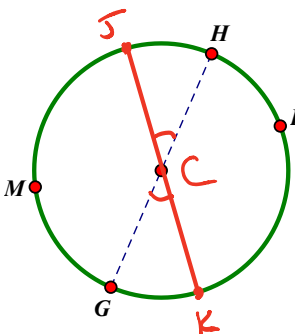
Arc Measure: the measure of an arc is the measure of its central angle. The measure of a semicircle is 180.

$$m\angle ABC = m\widehat{AC} = 40^\circ$$



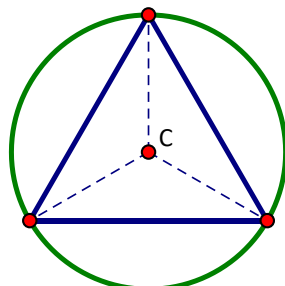
Arc Addition Postulate: The measure of an arc formed by two adjacent arcs is the sum of the measures of the two arcs.

$$m\widehat{GM} + m\widehat{MH} = m\widehat{GMH}$$



Theorem 12.1: In the same (or in congruent) circle, two arcs are congruent IFF their corresponding central angles are congruent.

$$\angle JCH \cong \angle GCK \text{ iff } \widehat{JK} \cong \widehat{GH}$$



Central angle of a regular polygon.

$$m\angle C = \frac{360}{n}$$

where n is the number of sides and $\angle C$ is the central angle.

$$m\angle C = \frac{360^\circ}{3}$$

$$m\angle C = 120^\circ$$

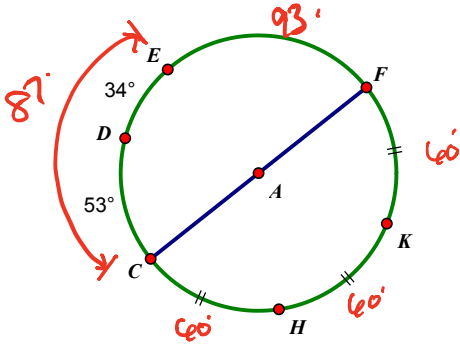
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Complete each equation.

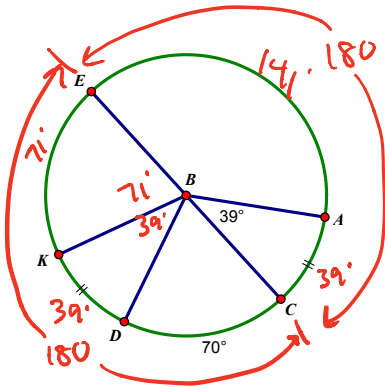


$$\begin{aligned} m\widehat{CE} &= \widehat{CD} + \widehat{DE} \\ &= 53^\circ + 34^\circ \\ &= 87^\circ \end{aligned}$$

$$m\widehat{EF} = 93^\circ$$

$$m\widehat{ECK} = 207^\circ$$

$$\begin{aligned} m\widehat{DFC} &= 360^\circ - 53^\circ \\ &= 307^\circ \end{aligned}$$



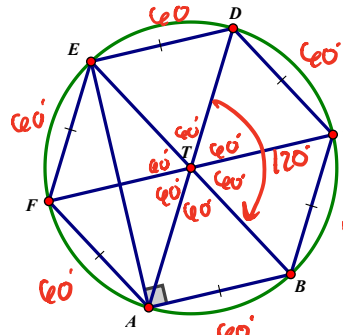
$$m\widehat{AC} = 39^\circ$$

$$m\widehat{AE} = 141^\circ$$

$$m\widehat{EK} = 71^\circ$$

$$m\angle KBD = 39^\circ$$

Given a regular polygon, complete each equation.



$$\begin{aligned} m\angle T &= \frac{360}{n} \\ &= \frac{360}{6} \end{aligned}$$

$$m\angle T = 60^\circ$$

$$m\angle ATB = 60^\circ$$

$$m\angle DTB = 120^\circ$$

$$m\widehat{AC} = 120^\circ$$

$$m\widehat{ECA} = 240^\circ$$

$$m\angle AEB = 30^\circ$$

If $AB = 5$ cm, what does $TB = 5$

If $AB = 5$ cm, what does $EA = 5\sqrt{3}$

