

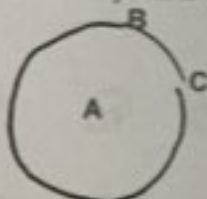
Lesson 10-2

ANGLES & ARCS

Arcs : The part or portion on the circle from some point B to C is called an **arc**.

Example:

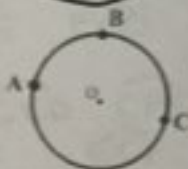
\widehat{BC}



Semicircle: An arc that is equal to 180° .

Example:

\widehat{ABC}

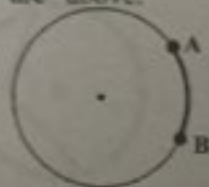


Minor Arc & Major Arc

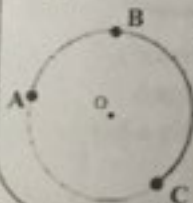
Minor Arc : A minor arc is an arc that is **less than** 180° .
A minor arc is named using its endpoints with an "arc" above.

Example:

\widehat{AB}



Major Arc: A major arc is an arc that is **greater than** 180° .



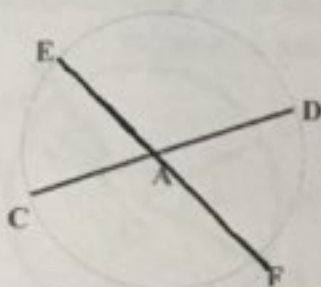
A major arc is named using its endpoints along with another point on the arc (in order).

Example:

\widehat{ABC}

Example: ARCS

Identify a minor arc, a major arc, and a semicircle, given that \overline{CD} is a diameter.



Minor Arc:

\widehat{CE} \widehat{ED} \widehat{DF} \widehat{CF}

Major Arc:

\widehat{EDC} \widehat{DFE} \widehat{FCD} \widehat{CEF}

Semicircle:

\widehat{CED} \widehat{CFD}
 \widehat{EDF} \widehat{ECF}

Lesson 8-1: Circle Terminology

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Central Angle

Definition: An angle whose vertex lies on the center of the circle.



Central
Angle
(of a circle)



Central
Angle
(of a circle)



NOT A
Central
Angle
(of a circle)

Lesson 8-1: Circle Terminology

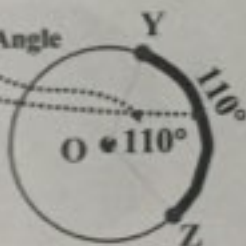
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Central Angle Theorem

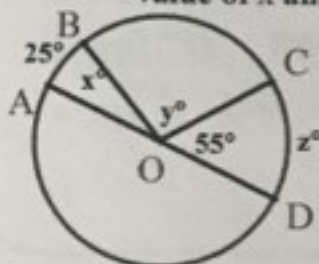
The measure of a center angle is equal to the measure of the intercepted arc.

Intercepted Arc

Center Angle



Example: Give \overline{AD} is the diameter, find the value of x and y and z in the figure.

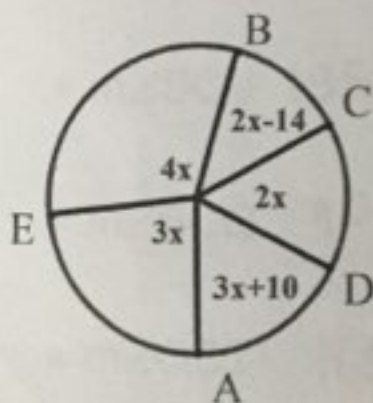


$$x = 25^\circ$$

$$y = 180^\circ - (25^\circ + 55^\circ) = 180 - 80 = 100^\circ$$

$$z = 55^\circ$$

Example: Find the measure of each arc.



$$4x + 3x + (3x + 10) + 2x + (2x - 14) = 360^\circ$$

$$14x - 4 = 360^\circ$$

$$14x = 364^\circ$$

$$x = 26^\circ$$

$$4x = 4(26) = 104^\circ$$

$$3x = 3(26) = 78^\circ$$

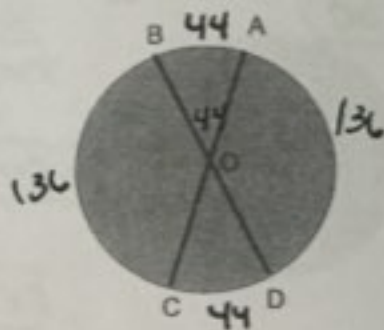
$$3x + 10 = 3(26) + 10 = 88^\circ$$

$$2x = 2(26) = 52^\circ$$

$$2x - 14 = 2(26) - 14 = 38^\circ$$

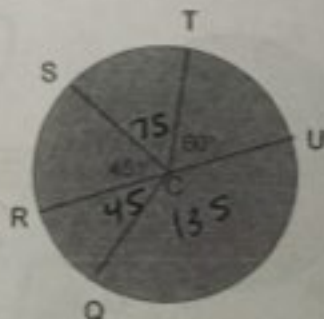
If $m\angle BOA = 44$, find each measure.

- $m\widehat{BA}$ 44
- $m\widehat{BC}$ 136
- $m\widehat{CD}$ 44
- $m\widehat{ACB}$ 316
- $m\widehat{BCD}$ 180
- $m\widehat{AD}$ 136



Find each measure.

- $m\angle SCT$ 75°
- $m\angle SCU$ 135
- $m\angle SCQ$ 90
- $m\angle QCT$ 165



$$\frac{\text{Degree of Arc}}{360} = \frac{\text{Length of Arc}}{\text{Circumference}}$$

$$m\widehat{AB} = \text{degree}$$

$$\widehat{AB} = \text{length}$$

$$\frac{\text{Degree of Arc}}{360}$$

The diameter is 24 units long. Find the length of each arc for the given measure.

$$\frac{\text{Length of Arc}}{\text{Circumference}} = \frac{\text{Degree of Arc}}{360}$$

DE if $m\angle DOE = 120$

$$\frac{DE}{24\pi} = \frac{120}{360} = \frac{DE}{24\pi}$$

$$360DE = 9047.79$$

$$DE = 25.13$$

• \widehat{DEA} if $m\angle DOE = 120$

$$\frac{240}{360} = \frac{\widehat{DEA}}{24\pi}$$

$$\widehat{DEA} = 49.97$$

• \widehat{BC} if $m\angle COB = 45$

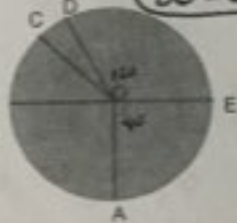
$$\frac{45}{360} = \frac{\widehat{BC}}{24\pi}$$

$$\widehat{BC} = 9.42$$

• \widehat{CBA} if $m\angle COB = 45$

$$\frac{135}{360} = \frac{\widehat{CBA}}{24\pi}$$

$$\widehat{CBA} = 28.27$$



The diameter is 15 units long and $\angle SPT \cong \angle RPT$. Find the length of each arc for the given angle measures.

• \widehat{RT} if $m\angle SPT = 70$

$$\frac{70}{360} = \frac{\widehat{RT}}{15\pi}$$

$$\widehat{RT} = 9.2$$

• \widehat{NR} if $m\angle RPT = 50$

$$\frac{80}{360} = \frac{\widehat{NR}}{15\pi}$$

$$\widehat{NR} = 10.5$$

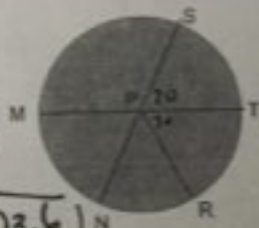
$$\frac{180}{360} = \frac{\widehat{MST}}{15\pi}$$

$$\widehat{MST} = 18.8$$

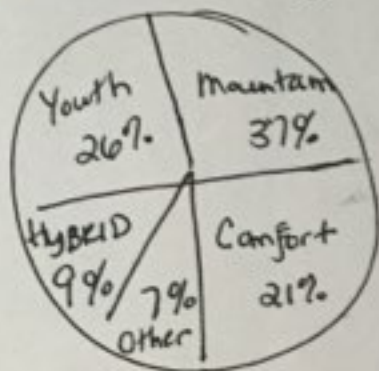
• \widehat{MRS} if $m\angle MPS = 140$

$$\frac{220}{360} = \frac{\widehat{MRS}}{15\pi}$$

$$\widehat{MRS} = 28.8$$



Bikes Bought



$$.37 \times 360 = 133.2^\circ \text{ Mountain}$$

$$.21 \times 360 = 75.6^\circ \text{ Comfort}$$

$$.07 \times 360 = 25.2^\circ \text{ Other}$$

$$.09 \times 360 = 32.4^\circ \text{ Hybrid}$$

$$.26 \times 360 = 93.6^\circ \text{ Youth}$$

How many degrees
should be allotted
to each category?