

10-2 Study Guide and Intervention *(continued)*

Angles and Arcs

Arc Length An arc is part of a circle and its length is a part of the circumference of the circle.

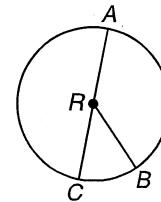
Example

In $\odot R$, $m\angle ARB = 135$, $RB = 8$, and \overline{AC} is a diameter. Find the length of \widehat{AB} .

$m\angle ARB = 135$, so $m\widehat{AB} = 135$. Using the formula $C = 2\pi r$, the circumference is $2\pi(8)$ or 16π . To find the length of \widehat{AB} , write a proportion to compare each part to its whole.

$\frac{\text{length of } \widehat{AB}}{\text{circumference}} = \frac{\text{degree measure of arc}}{\text{degree measure of circle}}$	Proportion
$\frac{\ell}{16\pi} = \frac{135}{360}$	Substitution
$\ell = \frac{(16\pi)(135)}{360}$	Multiply each side by 16π .
$= 6\pi$	Simplify.

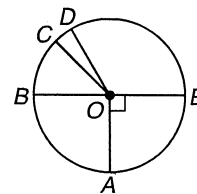
The length of \widehat{AB} is 6π or about 18.85 units.



Exercises

The diameter of $\odot O$ is 24 units long. Find the length of each arc for the given angle measure.

- \widehat{DE} if $m\angle DOE = 120$
- \widehat{DEA} if $m\angle DOE = 120$
- \widehat{BC} if $m\angle COB = 45$
- \widehat{CBA} if $m\angle COB = 45$



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

- \widehat{RT} if $m\angle SPT = 70$
- \widehat{NR} if $m\angle RPT = 50$
- \widehat{MST}
- \widehat{MRS} if $m\angle MPS = 140$

