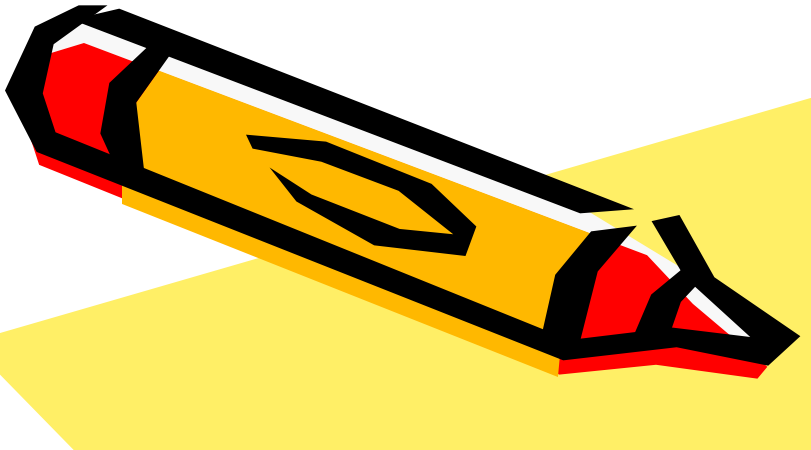
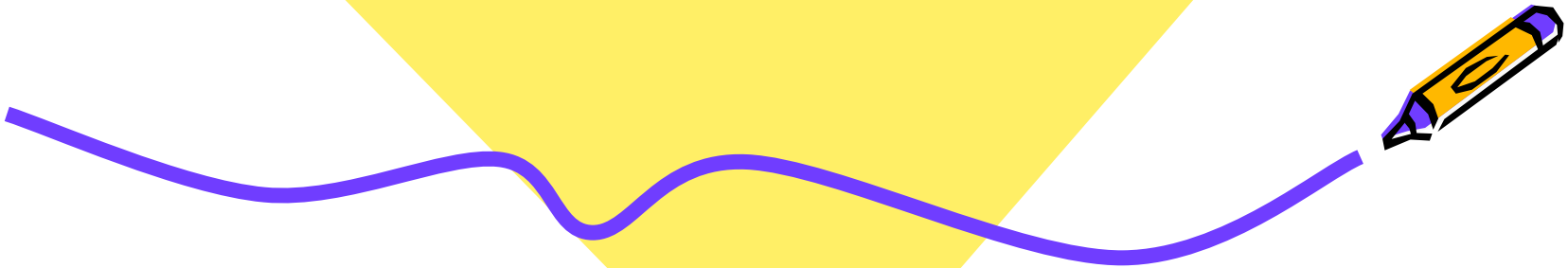


Geometry

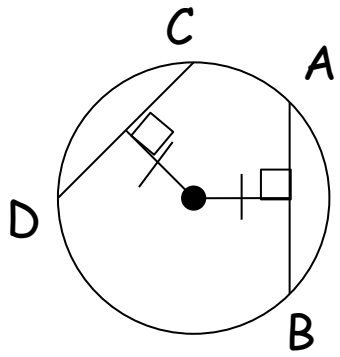
Arcs and Chords



Arcs and Chords

- In the same circle, or in congruent circles, two chords are congruent if and only if they are equidistant from the center.

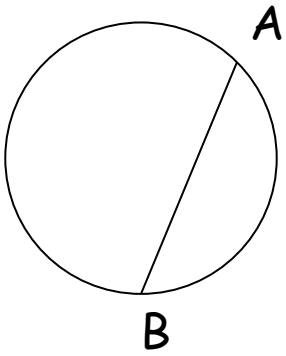
remember: we always look at perpendicular distance



Since the chords are equal distance from the center, they are congruent.

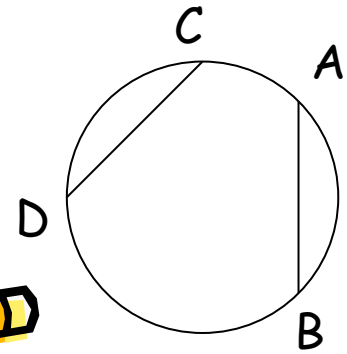
Arcs and Chords

- Arc of the chord:



$\overset{\frown}{AB}$ is considered to be the arc of the chord, $\overline{AB}$.

- In the same circle, or in congruent circles, two minor arcs are congruent if and only if their corresponding chords are congruent.

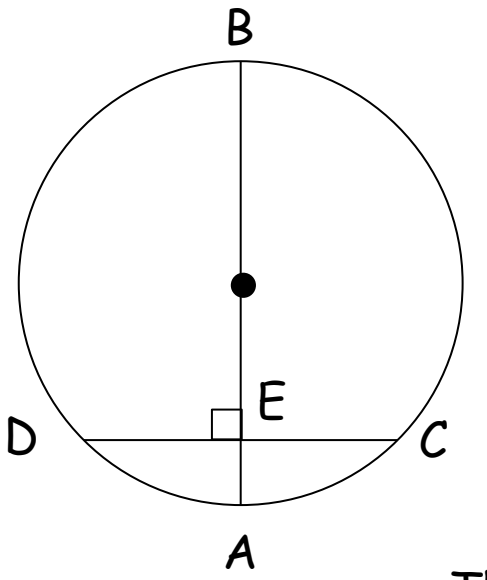


If $\overline{AB} \cong \overline{CD}$, then $\overset{\frown}{AB} \cong \overset{\frown}{CD}$.

If $\overset{\frown}{AB} \cong \overset{\frown}{CD}$, then $\overline{AB} \cong \overline{CD}$.

Arcs and Chords

- If a diameter or radius (or part of a diameter or radius) of a circle is perpendicular to a chord, then the diameter bisects the chord and its arc.



If $\overline{AB} \perp \overline{CD}$ then,

$\overline{DE} \cong \overline{EC}$

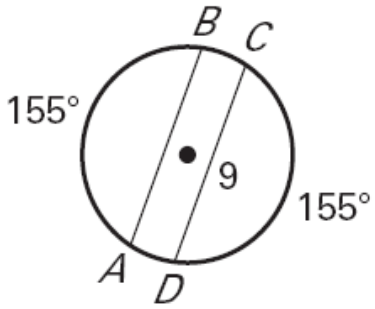
$\overset{\frown}{DA} \cong \overset{\frown}{AC}$

This rule will allow us to set up right triangles and do Pythagorean theorem and/or trigonometry.

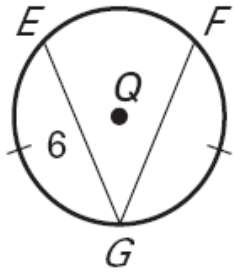
Examples

Find the chord length.

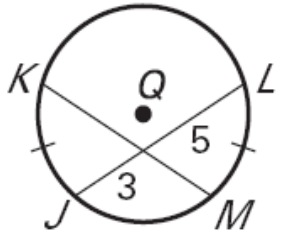
1. AB



2. FG

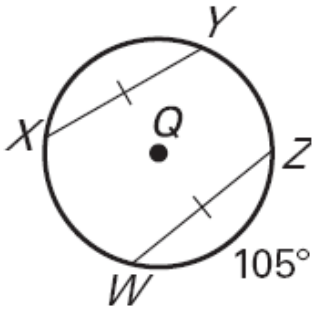


3. KM

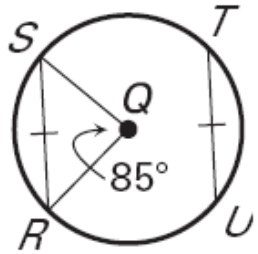


Find the arc measurement

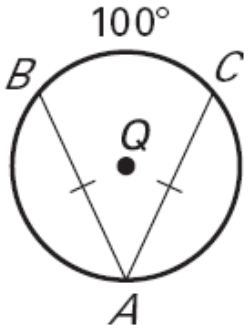
4. $m\overset{\frown}{XY}$



5. $m\overset{\frown}{TU}$



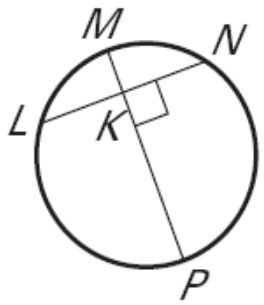
6. $m\overset{\frown}{AB}$



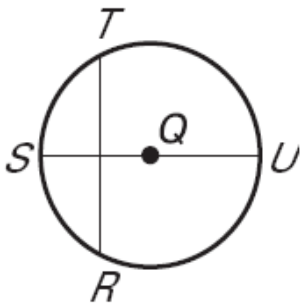
Examples

Tell whether the measures are equal.

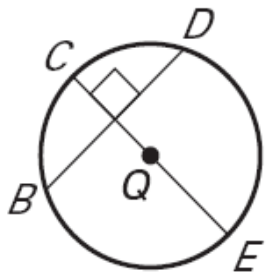
10. LK and KN



11. $m\overset{\frown}{ST}$ and $m\overset{\frown}{RS}$



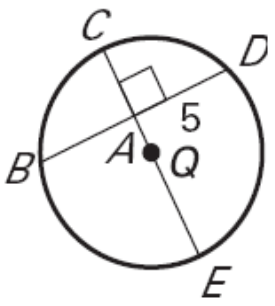
12. $m\overset{\frown}{BC}$ and $m\overset{\frown}{CD}$



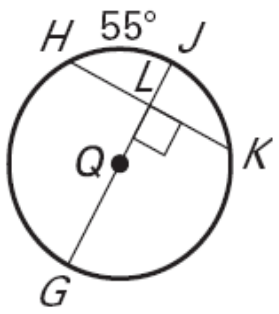
Examples

Find the given measure.

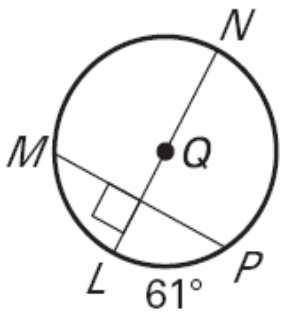
13. BD



14. $m\overset{\frown}{JK}$

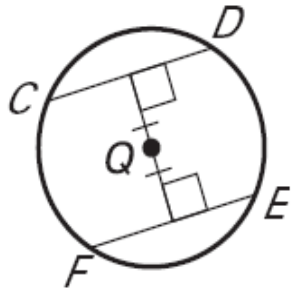


15. $m\overset{\frown}{MN}$

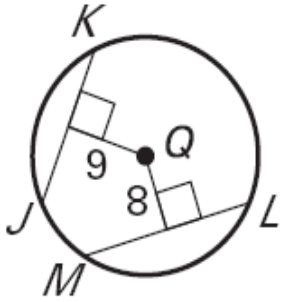


Tell whether the lengths are equal.

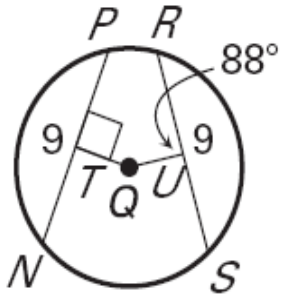
16. CD and EF



17. JK and LM



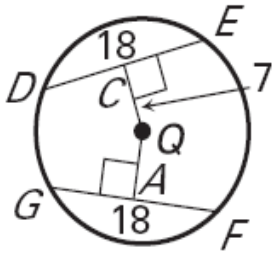
18. TQ and UQ



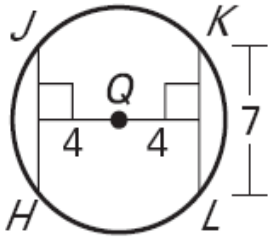
Examples

Find the given measure.

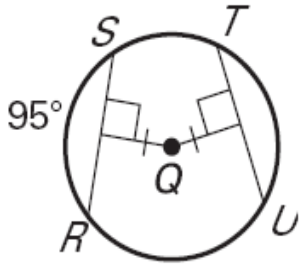
19. AQ



20. HJ

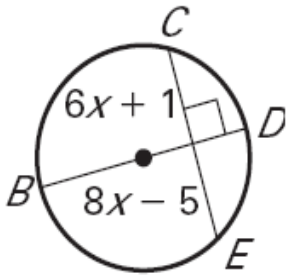


21. $m\widehat{TU}$

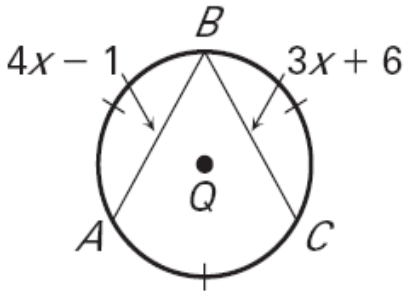


Find the value of *x*.

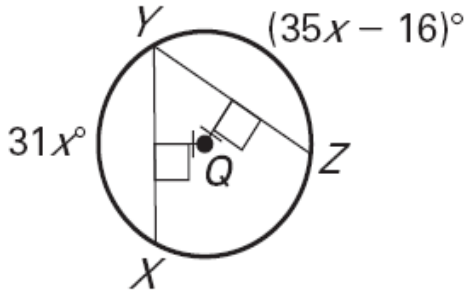
22.



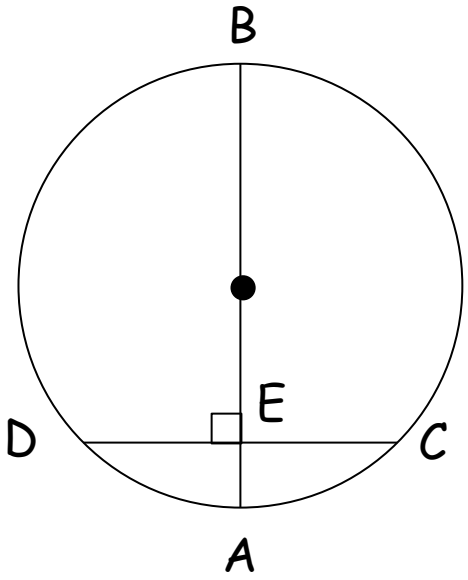
23.



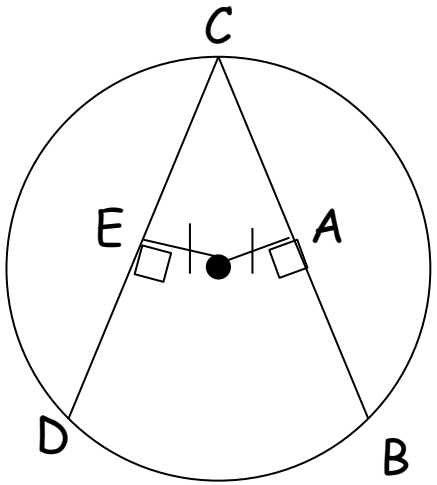
24.



Examples

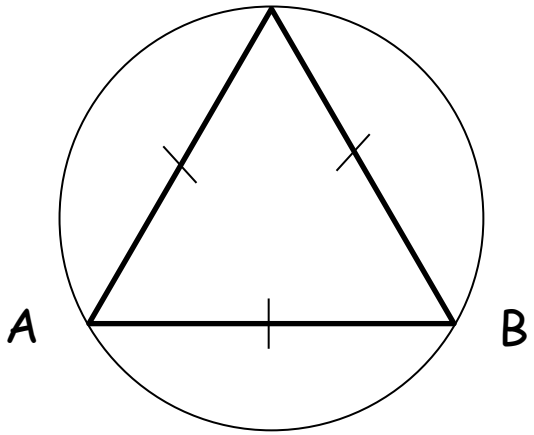


BA = 30
DC = 20
Find DE

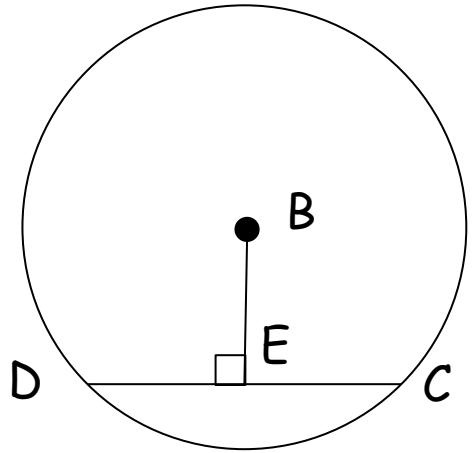


BC = 6x + 4
DC = 4x + 16
Find AC

Examples



Find $m\overset{\frown}{AB}$



DC = 24
BE = 9
Find the radius.