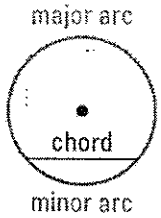
Geometry Notes

Name Key

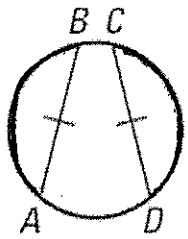
10.3 Apply Properties of Chords

Recall: A **chord** is a segment with endpoints on a circle. Any chord divides the circle into two arcs.



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

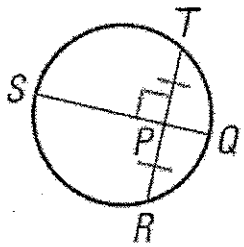
$\overline{AB} \cong \overline{CD}$ if and only if $\overset{\frown}{AB} \cong \overset{\frown}{CD}$



If one chord is a perpendicular bisector of another chord, then the first chord is a diameter.

If $\overline{QS}$ is a perpendicular bisector of $\overline{TR}$, then

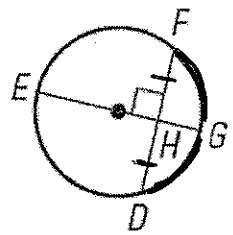
$\overline{QS}$ is a diameter



If a diameter of a circle is perpendicular to a chord, then it bisects the chord and its arc.

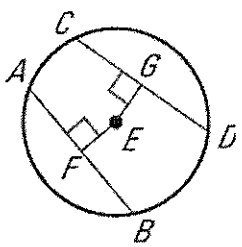
If $\overline{EG}$ is the diameter and $\overline{EG} \perp \overline{DF}$, then

$\overline{DH} \cong \overline{HF}$ and $\overset{\frown}{FG} \cong \overset{\frown}{DG}$



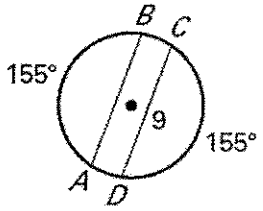
In the same circle, or in congruent circles, two chords are congruent if and only if they are equidistant from the center.

$\overline{EG} \cong \overline{EF}$ if and only if $\overline{CD} \cong \overline{AB}$

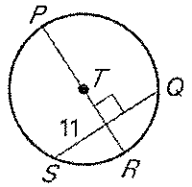


Find the measure of the given chord.

1. $\overline{AB}$ = 9

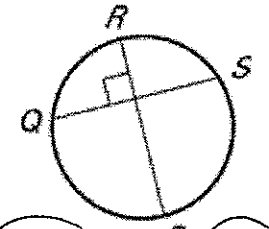


2. $\overline{SQ}$ = 22



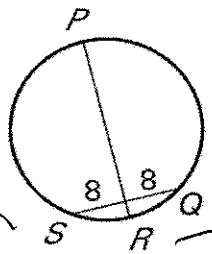
Is $\overline{PR}$ a diameter of the circle? Explain.

3.



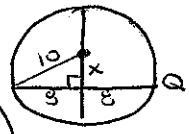
No... not enough info need to know the 2 segments of $\overline{QS}$ are ≅

4a.



No... not enough info need to know PR⊥QS

4b. If SQ=16 and the diameter of the circle is 20, how far from the center of the circle is SQ?

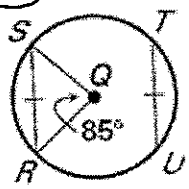


$x^2+8^2=10^2$
$x^2+64=100$
$x^2=36$
$x=\pm 6$

6 units from center

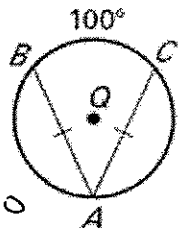
Find the missing arc measures.

5. $m\overset{\frown}{TU}$ = 85°



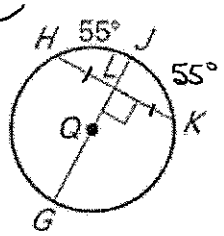
$\overset{\frown}{SR} \cong \overset{\frown}{TU}$
because $\overline{SR} = \overline{TU}$

6. $m\overset{\frown}{AC}$ = 130°



$\overset{\frown}{AC} = \overset{\frown}{AB}$
$360-100=260$
$260\div 2=130$

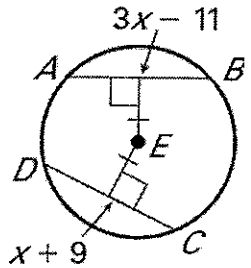
7. $m\overset{\frown}{HK}$ = 110°



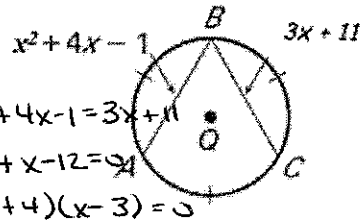
Find the value of x.

8.

AB = CD
$3x-11=x+9$
$2x=20$
x = 10



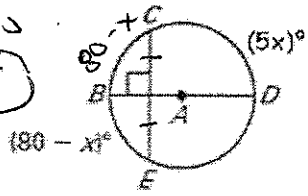
9. x = 3 only



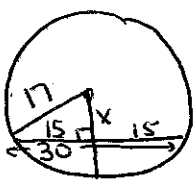
$x^2+4x-1=3x+11$
$x^2+x-12=0$
$(x+4)(x-3)=0$
$x=-4$ extran. x = 3

10.

$5x+80-x=180$
$4x=100$
x = 25



11. Suppose the radius of a circle is 17 inches and a chord is 30 inches. Find the distance from the center of the circle to the chord. Draw a picture to help!



$x^2+15^2=17^2$
$x^2+225=289$
$x^2=64$
$x=\pm 8$

8 inches from center