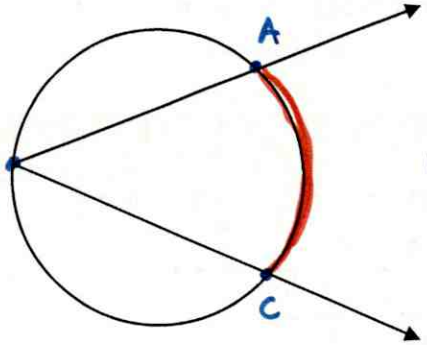
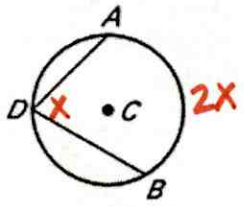
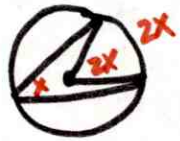
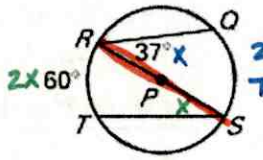
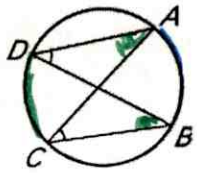
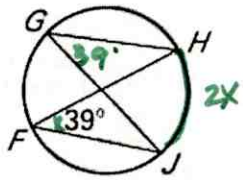
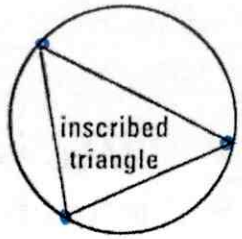
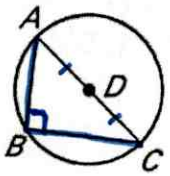
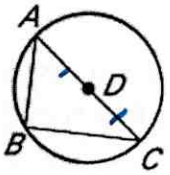
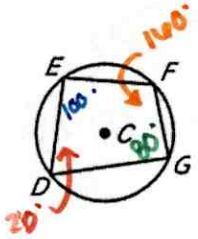
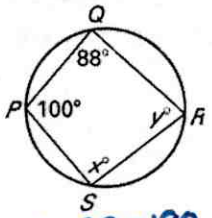
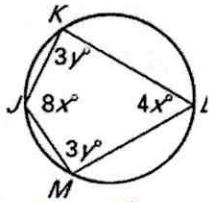
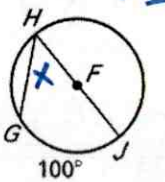
Section 10.4 Date _____

Use Inscribed Angles and Polygons

Vocabulary	Definition	Example
INSCRIBED ANGLE	An inscribed angle is an angle whose vertex is on the circle and whose sides contain chords of the circle	∠ABC is an inscribed angle. B is on the circle  Chords $\overline{AB}$ and $\overline{BC}$ Intercepted arc $\overset{\frown}{AC}$
INTERCEPTED ARC	The arc that lies in the interior of an inscribed angle and has endpoints on the angle is called the intercepted arc.	
THEOREM 10.7 THE MEASURE of an INSCRIBED ANGLE	The measure of an inscribed angle is half the measure of its intercepted arc.	 $m\angle ADB = \frac{1}{2}\overset{\frown}{AB}$   $\overset{\frown}{RQS} = 180°$ $m\overset{\frown}{TS} = 120°$ **Find the indicated measure in ⊙P.** a. $m\angle S = \frac{60}{2}$ $m\angle S = 30°$ b. $m\overset{\frown}{RQ} = 180 - 74$ $= 106°$
THEOREM 10.8	If two inscribed angles of a circle intercept the same arc, then the angles are congruent	 $\angle ADB \cong \angle ACB$ $\overset{\frown}{AB}$  $\angle Q = 40°$ $\angle S = 20°$ **Find $m\overset{\frown}{HJ}$ and $m\angle HGJ$.**  $m\overset{\frown}{HJ} = 2(39)$ $m\angle HGJ = 39°$ $78°$ $\angle DAC \cong \angle DBC$ $\overset{\frown}{DC}$

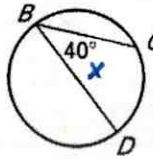
INSCRIBED POLYGON	A polygon is an inscribed polygon if all of its vertices lie on a circle.	 circumscribed circles 
CIRCUMSCRIBED CIRCLE	A circumscribed circle is a circle that contains the vertices of an inscribed polygon.	
THEOREM 10.9	If a right triangle is inscribed in a circle, then the hypotenuse is a diameter of the circle. Conversely, if one side of an inscribed triangle is a diameter of the circle, then the triangle is a right triangle and the angle opposite the diameter is the right angle.	$m\overset{\frown}{AC} = 180°$   then $\angle B = 90°$ $m\angle ABC = 90°$ if and only if $\overline{AC}$ is a diameter of the circle.
THEOREM 10.10	A quadrilateral can be inscribed in a circle if and only if its opposite angles are supplementary.	  $x + 88 = 180$ $x = 92°$ $y + 100 = 180$ $y = 80°$  $8x + 4x = 180$ $12x = 180$ $x = 15$ $3y + 3y = 180$ $6y = 180$ $y = 30$ D, E, F, and G lie on ⊙C if and only if $m\angle D + m\angle F = m\angle E + m\angle G =$ 180°. 180° 180°

1. $m\angle GHJ$ = 50



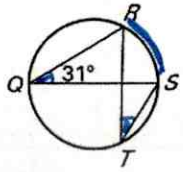
2x

2. $m\overset{\frown}{CD}$ = 80°

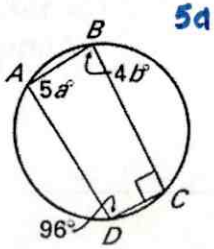


2x

3. $m\angle RTS$ = 31



Find the values of *a* and *b*.



$5a + 90 = 180$
$5a = 90$
$a = 18$

$4b + 96 = 180$
$4b = 84$
$b = 21$