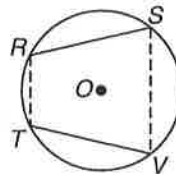


# 10-3 Study Guide and Intervention

## Arcs and Chords

**Arcs and Chords** Points on a circle determine both chords and arcs. Several properties are related to points on a circle.

- In a circle or in congruent circles, two minor arcs are congruent if and only if their corresponding chords are congruent.
- If all the vertices of a polygon lie on a circle, the polygon is said to be **inscribed** in the circle and the circle is **circumscribed** about the polygon.

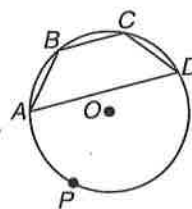


$\widehat{RS} \cong \widehat{TV}$  if and only if  $\overline{RS} \cong \overline{TV}$ .  
 $RSVT$  is inscribed in  $\odot O$ .  
 $\odot O$  is circumscribed about  $RSVT$ .

**Example** Trapezoid  $ABCD$  is inscribed in  $\odot O$ .

If  $\overline{AB} \cong \overline{BC} \cong \overline{CD}$  and  $m\widehat{BC} = 50$ , what is  $m\widehat{APD}$ ?

Chords  $\overline{AB}$ ,  $\overline{BC}$ , and  $\overline{CD}$  are congruent, so  $\widehat{AB}$ ,  $\widehat{BC}$ , and  $\widehat{CD}$  are congruent.  $m\widehat{BC} = 50$ , so  $m\widehat{AB} + m\widehat{BC} + m\widehat{CD} = 50 + 50 + 50 = 150$ . Then  $m\widehat{APD} = 360 - 150$  or  $210$ .



### Exercises

Each regular polygon is inscribed in a circle. Determine the measure of each arc that corresponds to a side of the polygon.

1. hexagon

60

2. pentagon

72

3. triangle

120

4. square

90

5. octagon

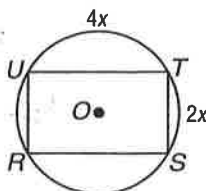
45

6. 36-gon

10

Determine the measure of each arc of the circle circumscribed about the polygon.

7.



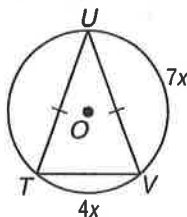
$$12x = 360$$

$$x = 30$$

$$m\widehat{UT} = m\widehat{RS} = 120$$

$$m\widehat{UR} = m\widehat{TS} = 60$$

8.



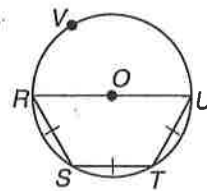
$$18x = 360$$

$$x = 20$$

$$m\widehat{UT} = m\widehat{UV} = 140$$

$$m\widehat{TV} = 80$$

9.



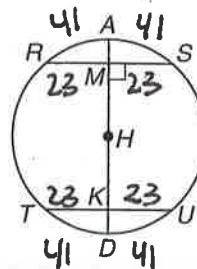
$$m\widehat{RS} = m\widehat{ST} = m\widehat{TU} = 60$$

$$m\widehat{RVU} = 180$$

# 10-3 Skills Practice

## Arcs and Chords

In  $\odot H$ ,  $m\widehat{RS} = 82$ ,  $m\widehat{TU} = 82$ ,  $RS = 46$ , and  $\widehat{TU} \cong \widehat{RS}$ . Find each measure.



1.  $TU = 46$

2.  $TK = 23$

3.  $MS = 23$

4.  $m\angle HKU = 90$

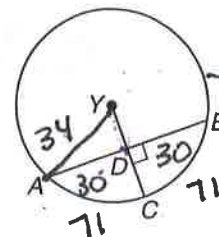
5.  $m\widehat{AS} = 41$

6.  $m\widehat{AR} = 41$

7.  $m\widehat{TD} = 41$

8.  $m\widehat{DU} = 41$

The radius of  $\odot Y$  is 34,  $AB = 60$ , and  $m\widehat{AC} = 71$ . Find each measure.



9.  $m\widehat{BC} = 71$

10.  $m\widehat{AB} = 142$

11.  $AD = 30$

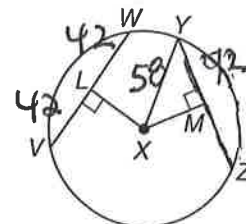
12.  $BD = 30$

13.  $YD = 16$

$30^2 + (YD)^2 = 34^2$

14.  $DC = 18$

In  $\odot X$ ,  $LX = MX$ ,  $XY = 58$ , and  $VW = 84$ . Find each measure.



15.  $YZ = 84$

16.  $YM = 42$

17.  $MX = 40$

18.  $MZ = 42$

19.  $LV = 42$

20.  $LX = 40$