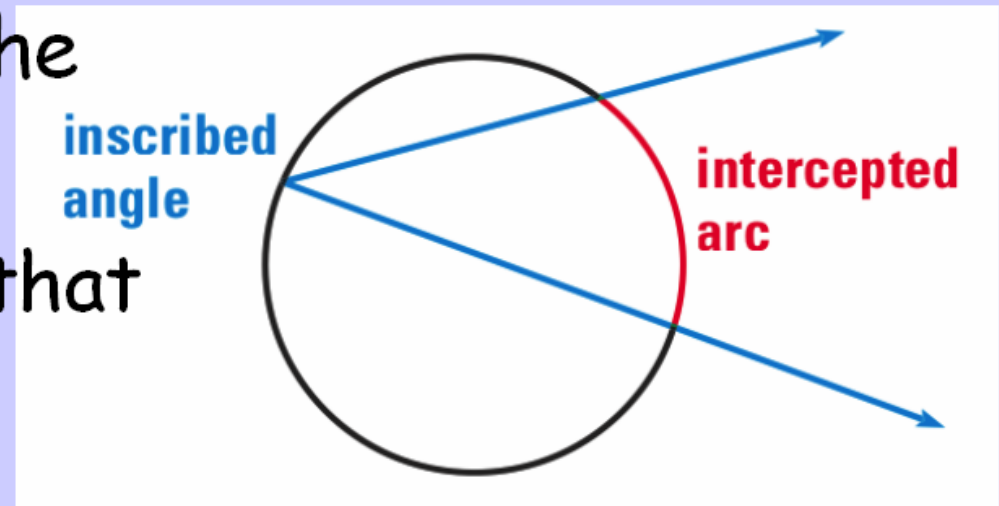


10.4 Use Inscribed Angles and Polygons

inscribed angle-An angle whose vertex is on a circle and whose sides contain chords of the circle _

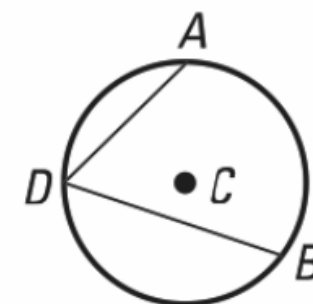
intercepted arc-The arc that lies in the interior of an inscribed angle and has endpoints on the angle



THEOREM*For Your Notebook***THEOREM 10.7** Measure of an Inscribed Angle Theorem

The measure of an inscribed angle is one half the measure of its intercepted arc.

Proof: Exs. 31–33, p. 678

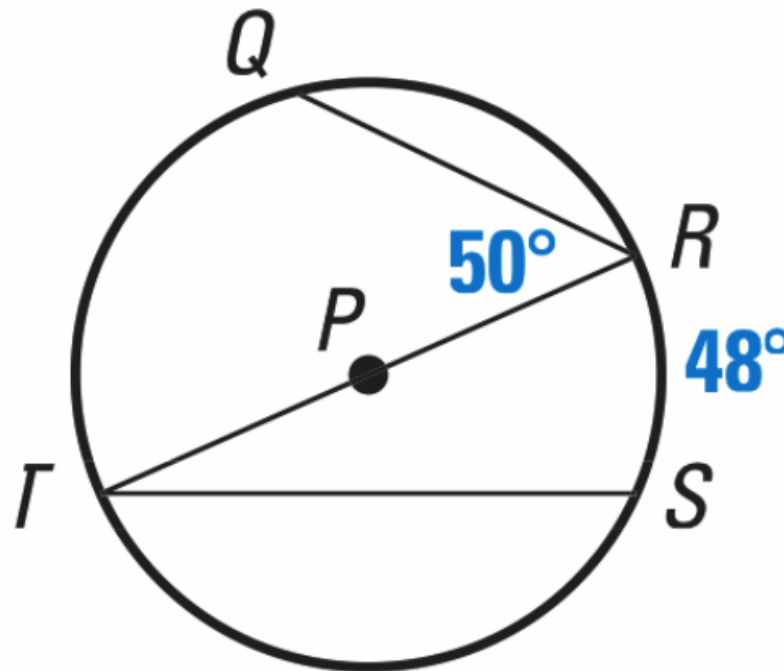


$$m\angle ADB = \frac{1}{2}m\widehat{AB}$$

EXAMPLE 1 Use inscribed anglesFind the indicated measure in $\odot P$.

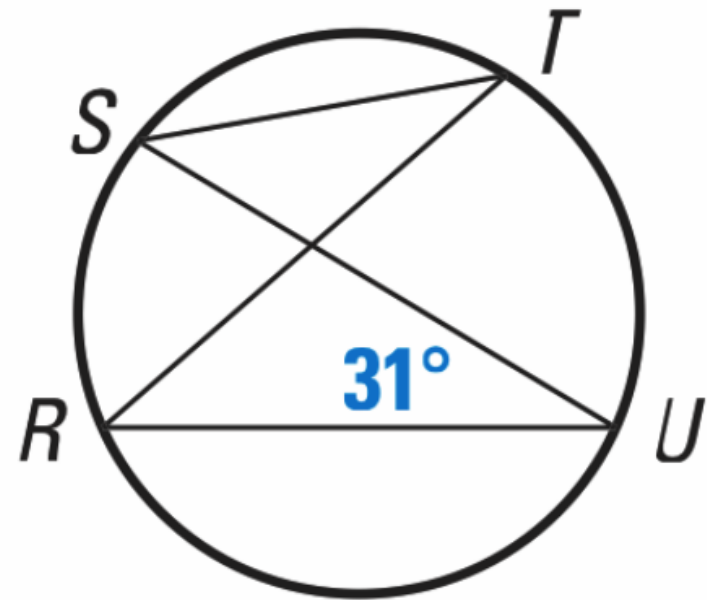
a. $m\angle T$

b. $m\widehat{QR}$



EXAMPLE 2 Find the measure of an intercepted arc

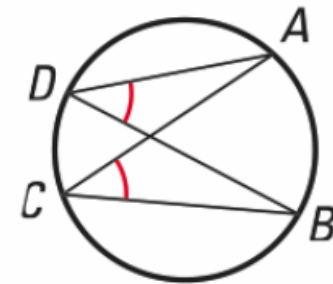
Find $m\widehat{RS}$ and $m\angle STR$. What do you notice about $\angle STR$ and $\angle RUS$?



THEOREM*For Your Notebook***THEOREM 10.8**

If two inscribed angles of a circle intercept the same arc, then the angles are congruent.

Proof: Ex. 34, p. 678

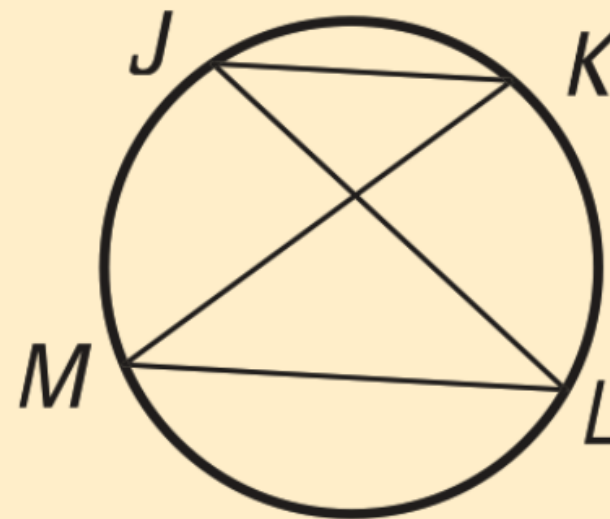


$$\angle ADB \cong \angle ACB$$

EXAMPLE 3 Standardized Test Practice

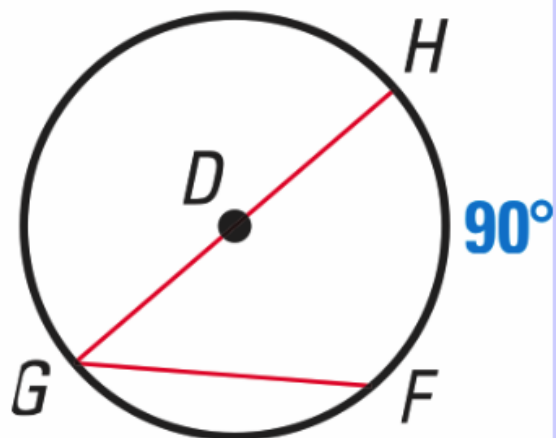
Name two pairs of congruent angles in the figure.

- Ⓐ $\angle JKM \cong \angle KJL$,
 $\angle JLM \cong \angle KML$
- Ⓑ $\angle JLM \cong \angle KJL$,
 $\angle JKM \cong \angle KML$
- Ⓒ $\angle JKM \cong \angle JLM$,
 $\angle KJL \cong \angle KML$
- Ⓓ $\angle JLM \cong \angle KJL$,
 $\angle JLM \cong \angle JKM$

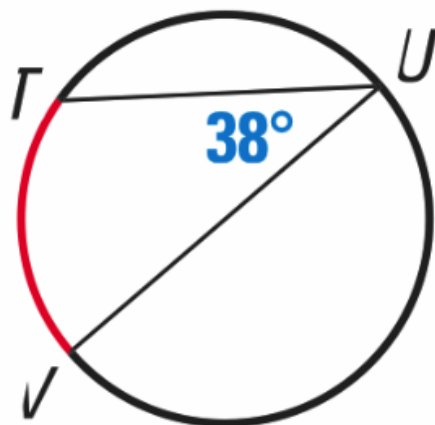


Find the measure of the red arc or angle.

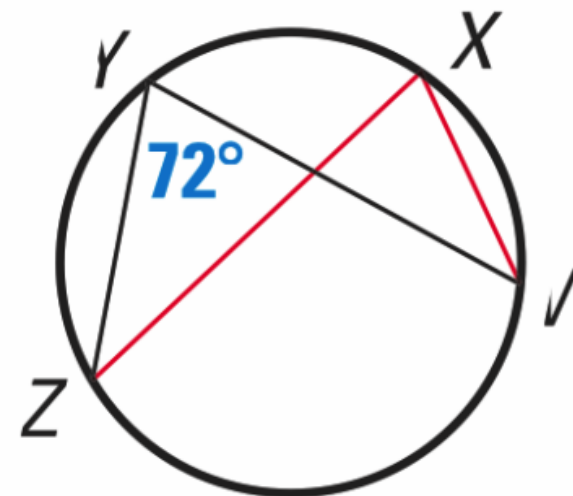
1.



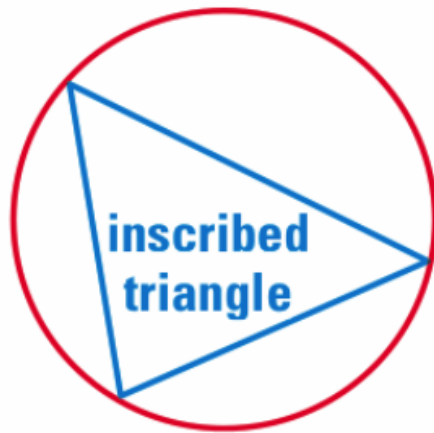
2.



3.



POLYGONS A polygon is an **inscribed polygon** if all of its vertices lie on a circle. The circle that contains the vertices is a **circumscribed circle**.



**circumscribed
circles**

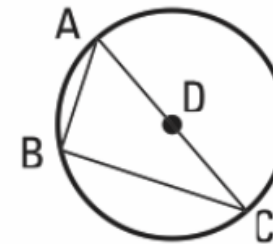


THEOREM*For Your Notebook***THEOREM 10.9**

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.

Proof: Ex. 35, p. 678



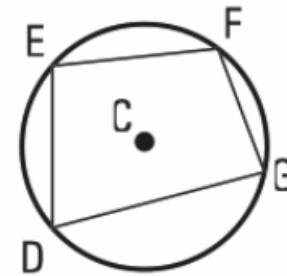
$m\angle ABC = 90^\circ$ if and only if \overline{AC} is a diameter of the circle.

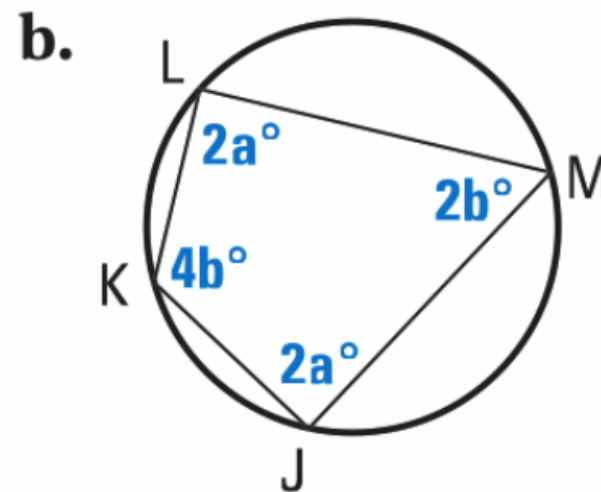
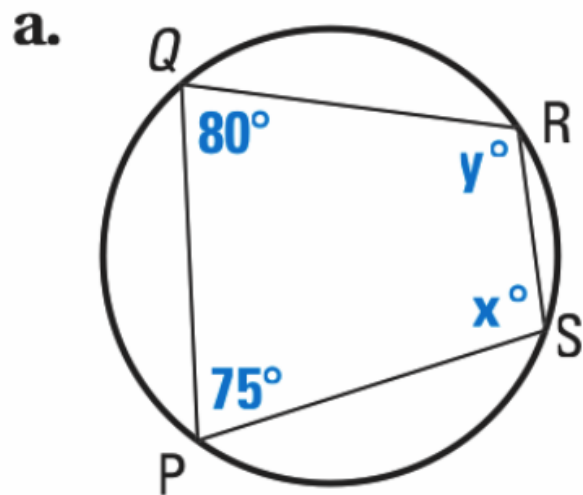
THEOREM*For Your Notebook***THEOREM 10.10**

A quadrilateral can be inscribed in a circle if and only if its opposite angles are supplementary.

$D, E, F,$ and G lie on $\odot C$ if and only if
 $m\angle D + m\angle F = m\angle E + m\angle G = 180^\circ$.

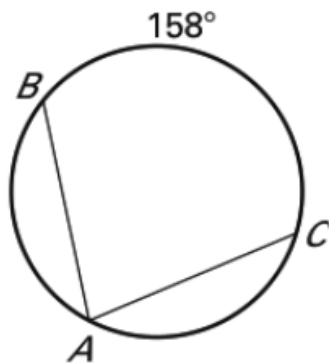
Proof: Ex. 30, p. 678; p. 938



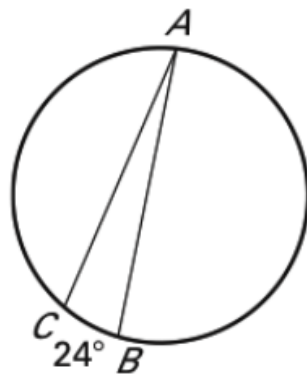
EXAMPLE 5 Use Theorem 10.10**Find the value of each variable.**

Find the indicated measure.

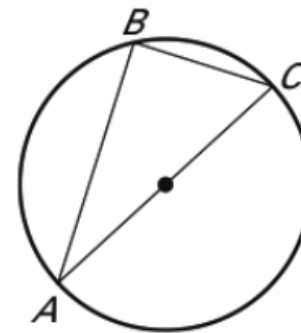
1. $m\angle A$



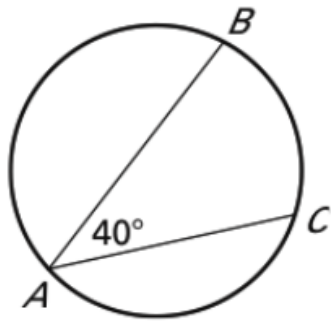
2. $m\angle A$



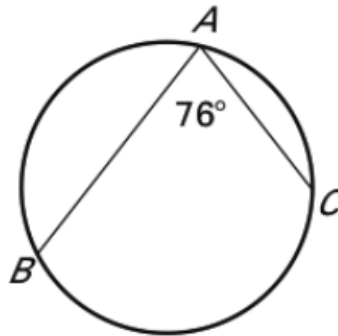
3. $m\angle B$



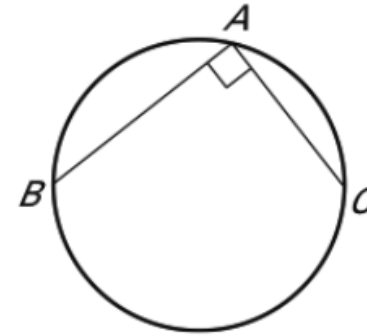
4. $m\widehat{BC}$



5. $m\widehat{BC}$



6. $m\widehat{BC}$



Assignment:

10.4 WS

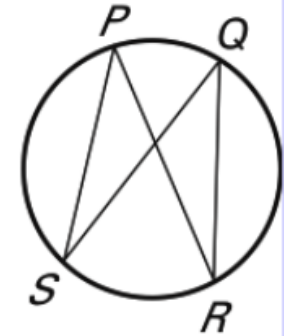
1. Multiple Choice In the figure shown, which statement is true?

A. $\angle SPR \cong \angle PSQ$

B. $\angle RQS \cong \angle RPS$

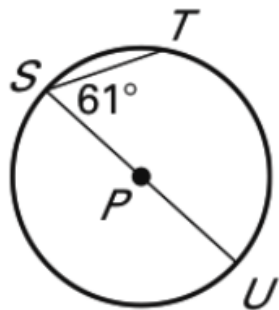
C. $\angle RPS \cong \angle PRQ$

D. $\angle PRQ \cong \angle SQR$

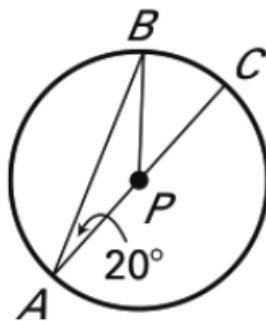


Find the measure of the indicated angle or arc in $\odot P$.

2. $m\widehat{ST}$



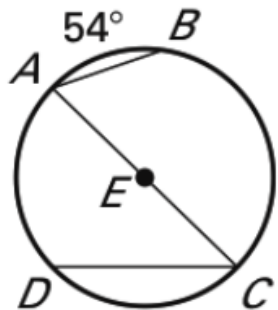
3. $m\widehat{AB}$



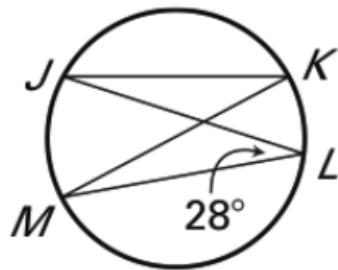
4. $m\angle JLM$



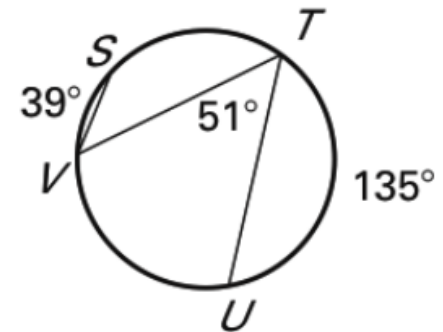
5. $m\angle A$



6. $m\angle K$



7. $m\widehat{VST}$



Find the measure of the indicated angle or arc in $\odot P$, given $m\widehat{LM} = 84^\circ$ and $m\widehat{KN} = 116^\circ$.

8. $m\angle JKL$

9. $m\angle MKL$

10. $m\angle KMN$

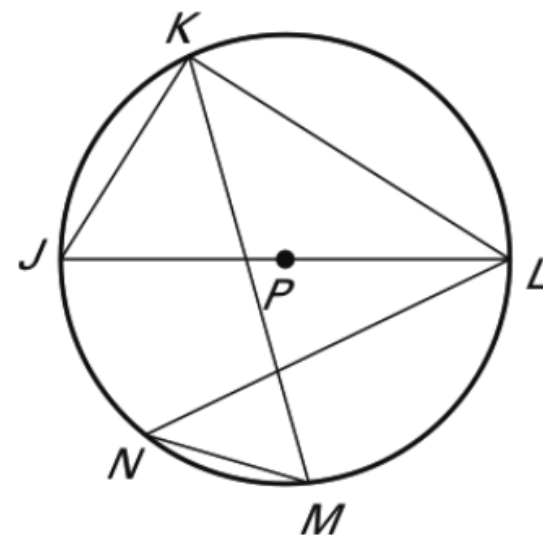
11. $m\angle JKM$

12. $m\angle KLN$

13. $m\angle LNM$

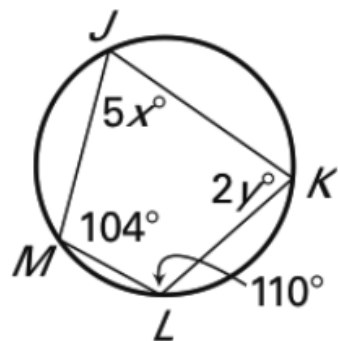
14. $m\widehat{MJ}$

15. $m\widehat{LKJ}$

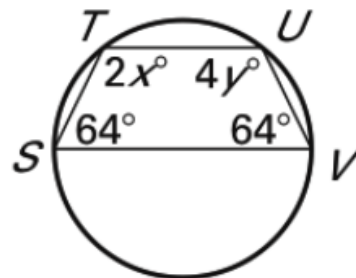


Find the values of the variables.

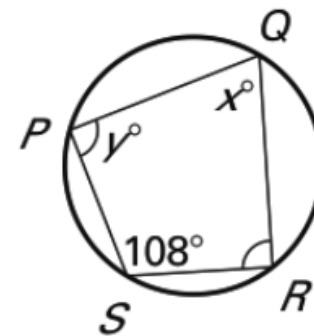
16.

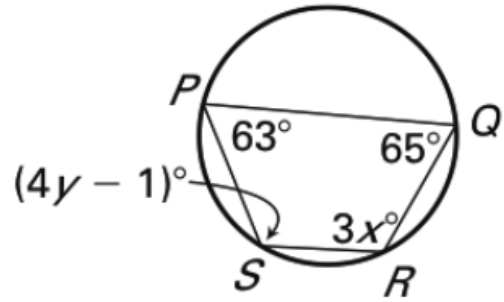
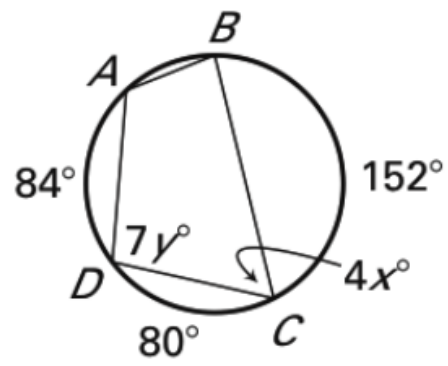
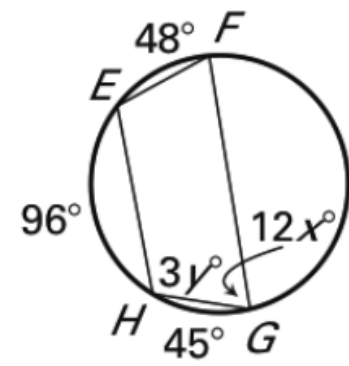


17.



18.



19.**20.****21.**

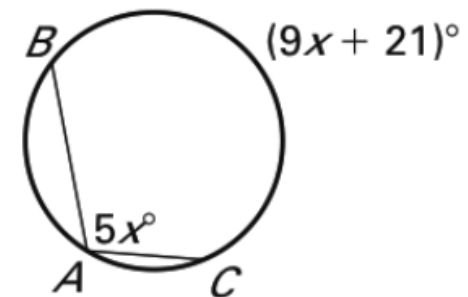
22. Multiple Choice What is the value of x in the figure shown?

A. 7

B. 12

C. 16

D. 21



Assignment:

p. 676 (3-16, 18, 40-42 all)