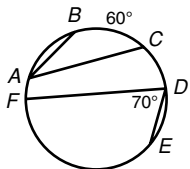


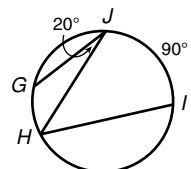
LESSON **Practice A**
11-4 **Inscribed Angles**

In Exercises 1–4, fill in the blanks to complete each theorem.

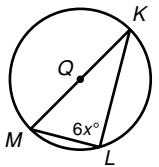
1. If a quadrilateral is inscribed in a circle, then its opposite angles are _____.
2. If inscribed angles of a circle intercept the same arc or are subtended by the same chord or arc, then the angles are _____.
3. The measure of an inscribed angle is _____ the measure of its intercepted arc.
4. An inscribed angle subtends a semicircle if and only if the angle is a _____.

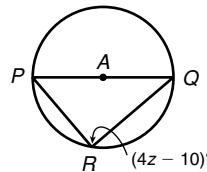
Find each measure.

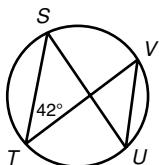
5.  $m\angle BAC =$ _____
 $m\widehat{FE} =$ _____

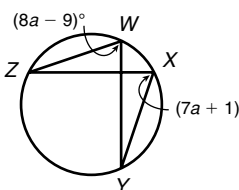
6.  $m\angle IHJ =$ _____
 $m\widehat{GH} =$ _____

Find each value.

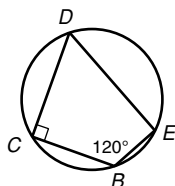
7.  $x =$ _____

8.  $z =$ _____

9.  $m\angle VUS =$ _____

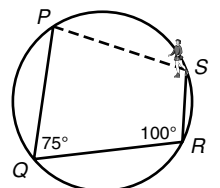
10.  $m\angle ZWY =$ _____

Find the angle measures of each inscribed quadrilateral.

11.  $m\angle B =$ _____
 $m\angle C =$ _____
 $m\angle D =$ _____
 $m\angle E =$ _____

12.  $m\angle F =$ _____
 $m\angle G =$ _____
 $m\angle H =$ _____
 $m\angle I =$ _____

13. Iyla has not learned how to stop on ice skates yet, so she just skates straight across the circular rink until she hits a wall. She starts at P , turns 75° at Q , and turns 100° at R . Find how many degrees Iyla will turn at S to get back to her starting point.



LESSON 11-4 Practice A

Inscribed Angles

In Exercises 1–4, fill in the blanks to complete each theorem.

- If a quadrilateral is inscribed in a circle, then its opposite angles are supplementary.
- If inscribed angles of a circle intercept the same arc or are subtended by the same chord or arc, then the angles are congruent.
- The measure of an inscribed angle is half the measure of its intercepted arc.
- An inscribed angle subtends a semicircle if and only if the angle is a right angle.

Find each measure.

- $m\angle BAC = 30^\circ$, $m\angle FE = 140^\circ$
- $m\angle IHJ = 45^\circ$, $m\angle GH = 40^\circ$

Find each value.

- $x = 15$
- $z = 25$
- $m\angle VUS = 42^\circ$
- $m\angle ZWY = 71^\circ$

Find the angle measures of each inscribed quadrilateral.

- $m\angle B = 120^\circ$, $m\angle C = 90^\circ$, $m\angle D = 60^\circ$, $m\angle E = 90^\circ$
- $m\angle F = 130^\circ$, $m\angle G = 100^\circ$, $m\angle H = 50^\circ$, $m\angle I = 80^\circ$
- Iyla has not learned how to stop on ice skates yet, so she just skates straight across the circular rink until she hits a wall. She starts at P, turns 75° at Q, and turns 100° at R. Find how many degrees Iyla will turn at S to get back to her starting point.
105°

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LESSON 11-4 Practice B

Inscribed Angles

Find each measure.

- $m\angle CED = 33^\circ$, $m\angle DEA = 192^\circ$
- $m\angle FGI = 9^\circ$, $m\angle GH = 78^\circ$
- $m\angle QRS = 130^\circ$, $m\angle TSR = 138^\circ$
- $m\angle XVU = 10^\circ$, $m\angle VXW = 90.5^\circ$

Find each value.

- $m\angle CED = 48^\circ$
- $a = 6$
- $y = 13$
- $m\angle SRT = 77^\circ$

Find the angle measures of each inscribed quadrilateral.

- $m\angle X = 71^\circ$, $m\angle Y = 109^\circ$, $m\angle Z = 109^\circ$, $m\angle W = 71^\circ$
- $m\angle C = 90^\circ$, $m\angle D = 90^\circ$, $m\angle E = 90^\circ$, $m\angle F = 90^\circ$
- $m\angle K = 59^\circ$, $m\angle L = 73^\circ$, $m\angle M = 121^\circ$, $m\angle N = 107^\circ$

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LESSON 11-4 Practice C

Inscribed Angles

Write paragraph proofs for Exercises 1 and 2.

- Given: $\overline{AC} \cong \overline{AD}$
Prove: $\angle ABC \cong \angle AED$

Possible answer: It is given that $\overline{AC} \cong \overline{AD}$. In a circle, congruent chords intercept congruent arcs, so $\widehat{ABC} \cong \widehat{AED}$. \widehat{DC} is congruent to itself by the Reflexive Property of Congruence. By the Arc Addition Postulate and the Addition Property of Congruence, $\widehat{ACD} \cong \widehat{ADC}$. $\angle ABC$ intercepts \widehat{ADC} , so $m\angle ABC = \frac{1}{2}m\widehat{ADC}$. $\angle AED$ intercepts \widehat{ACD} , so $m\angle AED = \frac{1}{2}m\widehat{ACD}$. By substitution, $m\angle ABC = m\angle AED$. Therefore $\angle ABC \cong \angle AED$.

- Given: $\overline{PQ} \cong \overline{RS}$
Prove: $\overline{QR} \parallel \overline{PS}$

Possible answer: It is given that $\overline{PQ} \cong \overline{RS}$. By the definition of congruent arcs, $m\widehat{PQ} = m\widehat{RS}$. $\angle PSQ$ intercepts \widehat{PQ} , and $\angle RQS$ intercepts \widehat{RS} . So $m\angle PSQ$ must equal $m\angle RQS$. Therefore $\angle PSQ \cong \angle RQS$. $\angle PSQ$ and $\angle RQS$ are congruent alternate interior angles of \overline{QR} and \overline{PS} . So $\overline{QR} \parallel \overline{PS}$.

For each quadrilateral described, tell whether it can be inscribed in a circle. If so, describe a method for doing so using a compass and straightedge, and draw an example.

- a parallelogram that is not a rectangle or a square cannot be inscribed in a circle
- a kite
Can be inscribed in a circle; possible answer: The two congruent angles of the kite are opposite, so they must be right angles. Draw a diameter. Draw segments from opposite ends of the diameter to any point on the circle. Use the compass to copy one of the segments across the diameter. Draw the fourth side.
- a trapezoid
Can be inscribed in a circle; possible answer: The pairs of base angles of a trapezoid inscribed in a circle must be congruent. Draw any inscribed angle. Use the compass to copy the arc that this angle intercepts. Mark off the same arc from the vertex of the inscribed angle. Connect the points.
- a rhombus that is not a square cannot be inscribed in a circle

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LESSON 11-4 Reteach

Inscribed Angles

Inscribed Angle Theorem	
The measure of an inscribed angle is half the measure of its intercepted arc.	
Inscribed Angles	
If inscribed angles of a circle intercept the same arc, then the angles are congruent.	
An inscribed angle subtends a semicircle if and only if the angle is a right angle.	

Find each measure.

- $m\angle LMP$ and $m\widehat{MN}$
 $m\angle LMP = 18^\circ$; $m\widehat{MN} = 96^\circ$
- $m\angle GFJ$ and $m\widehat{FH}$
 $m\angle GFJ = 55^\circ$; $m\widehat{FH} = 72^\circ$

Find each value.

- x
 16.4
- $m\angle FJH$
 45°

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