

**Lesson 12-4: Inscribed Angles**

An **inscribed angle** is an angle whose vertex is on a circle and whose sides contain chords of the circle. An **intercepted arc** consists of endpoints that lie on the sides of an inscribed angle and all the points of the circle between them. A chord or arc **subtends** an angle if its endpoints lie on the sides of the angle.



**Theorem 12-4-1 Inscribed Angle Theorem**

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

$m\angle ABC = \frac{1}{2}m\widehat{AC}$



**Ex. 1 Finding Measures of Arcs and Inscribed Angles**

Find each measure.

a.  $m\angle RST$



b.  $m\widehat{SD}$

**Ex. 2**

Find each measure.

a.  $m\widehat{DE}$

b.  $m\angle DAE$

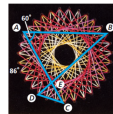


**Corollary 12-4-2**

COROLLARY	HYPOTHESIS	CONCLUSION
If inscribed angles of a circle intercept the same arc or are subtended by the same chord or arc, then the angles are congruent.		$\angle ACB \cong \angle ADB \cong \angle AEB$ (and $\angle CAE \cong \angle CBE$ )
	$\angle ACB$ , $\angle ADB$ , and $\angle AEB$ intercept $\widehat{AB}$ .	

**Ex. 3 Hobby Application**

Find  $m\angle DEC$ , if  $m\widehat{AD} = 80^\circ$ .



**Ex. 4** Find  $m\angle ABD$  and  $m\widehat{BC}$  in the string art.

**Theorem 12-4-3**

An inscribed angle subtends a semicircle if and only if the angle is a right angle.



**Ex. 5 Finding Angle Measures in Inscribed Triangles**

Find each value.

a.  $x$



b.  $m\angle ADC$



**Ex. 6** Find each value.

3a.  $z$



3b.  $m\angle EDF$



**Theorem 12-4-4**

THEOREM	HYPOTHESIS	CONCLUSION
If a quadrilateral is inscribed in a circle, then its opposite angles are supplementary.		$\angle A$ and $\angle C$ are supplementary. $\angle B$ and $\angle D$ are supplementary.
	$ABCD$ is inscribed in $\odot E$ .	

**Ex. 7 Finding Angle Measures in Inscribed Quadrilaterals**

Find the angle measures of PQRS.



**Ex. 8** Find the angle measures of JKLM.

