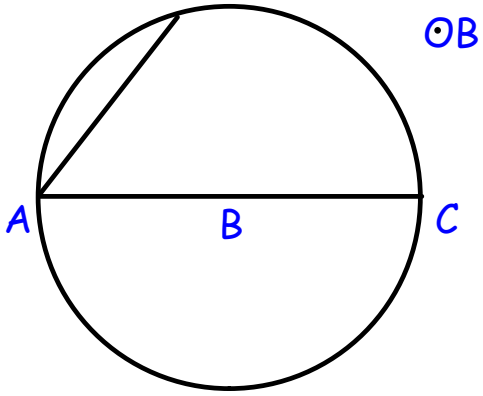
12-4 Inscribed Angles

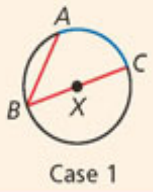
An inscribed angle is an angle whose _____ is on a circle, and whose sides are _____.
An _____ arc consists of endpoints that lie on the sides of an inscribed angle including all points inbetween.



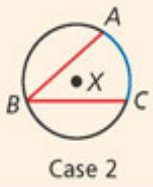
Lets discover a Theorem!

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

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

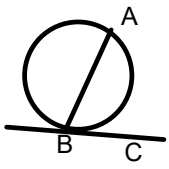


Case 1



Case 2

Case 3

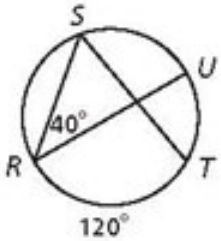


Case 4

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

Find each measure.

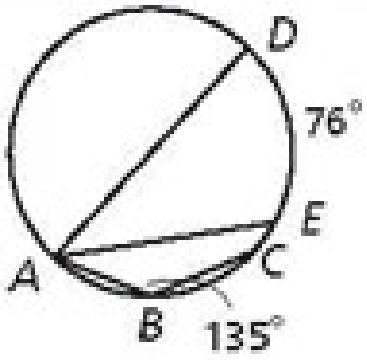
A $m\angle RST$

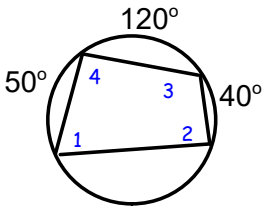


B $m\overset{\frown}{SU}$

C $m\overset{\frown}{ADC}$

$m\angle DAE$



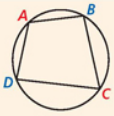


Find:

m < 1 = _____ m < 3 = _____

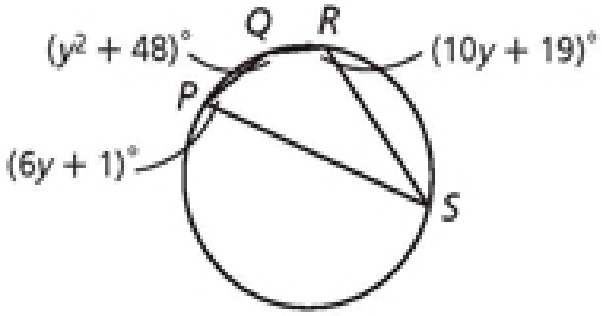
m < 2 = _____ m < 4 = _____

Theorem 12-4-4

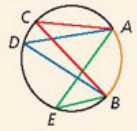
THEOREM	HYPOTHESIS	CONCLUSION
If a quadrilateral is inscribed in a circle, then its opposite angles are supplementary.	 ABCD is inscribed in ⊙E.	

4 Finding Angle Measures in Inscribed Quadrilaterals

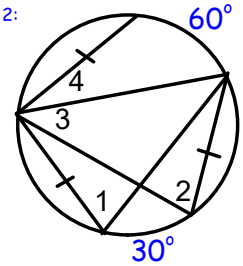
Find the angle measures of *PQRS*



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.		

Ex 2:



Find: m < 1 = _____

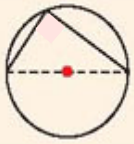
m < 2 = _____

m < 3 = _____

m < 4 = _____

Theorem 12-4-3

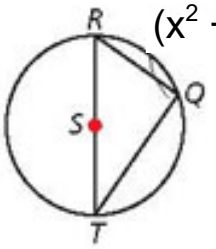
An inscribed angle subtends a semicircle if and only if the angle is a _____



3 Finding Angle Measures in Inscribed Triangles

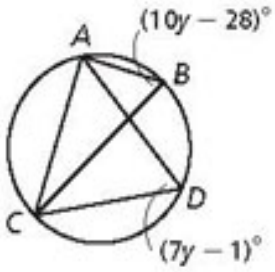
Find each value.

A x



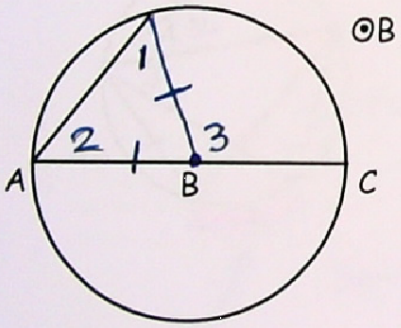
$(x^2 + 54)^\circ$

B $m\angle ADC$



12-4 Inscribed Angles

An inscribed angle is and angle whose vertex is on a circle, and whose sides are chords.
An intercepted arc consists of endpoints that lie on the sides of an inscribed angle including all points inbetween.



Lets discover a Theorem!

$m\angle 1 + m\angle 2 = m\angle 3$

$m\angle 1 = m\angle 2$

$m\angle 2 + m\angle 2 = m\angle 3$

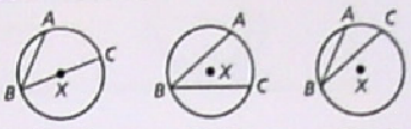
$2(m\angle 2) = m\angle 3$

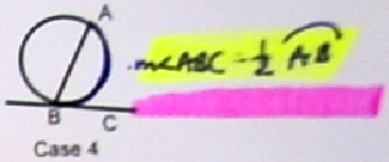
$m\angle 2 = \frac{1}{2}(m\angle 3)$

Theorem 12-4-1 Inscribed Angle Theorem

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

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



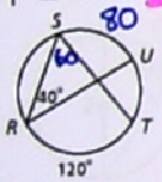


$m\angle ABC = \frac{1}{2}\overset{\frown}{AB}$

1 Finding Measures of Arcs and Inscribed Angles

Find each measure.

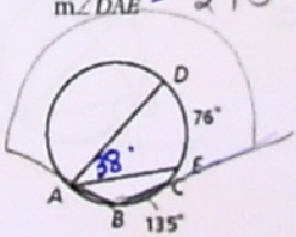
A $m\angle RST$ 60°



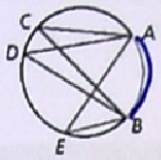
B $m\overset{\frown}{SU}$ 80°

C $m\overset{\frown}{ADC}$ = 270°

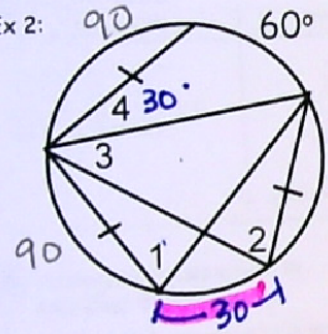
$m\angle DAE$ = 38°



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.		$m\angle C = m\angle D = m\angle E$

Ex 2:



Find: $m\angle 1 = 75$

$m\angle 2 = 75$

$m\angle 3 = 45$

$m\angle 4 = 30$

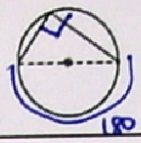
360
− 60
− 30
300

270 ÷ 3 = 90

Give them this

Theorem 12-4-3

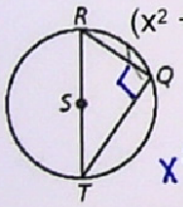
An inscribed angle subtends a semicircle if and only if the angle is a right <



3 **Finding Angle Measures in Inscribed Triangles**

Find each value.

A x

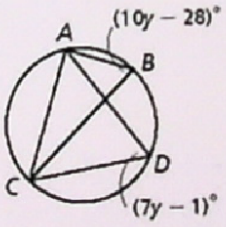


$x^2 + 54 = 90$

$x^2 = 36$

$x = \pm 6$

B $m\angle ADC$



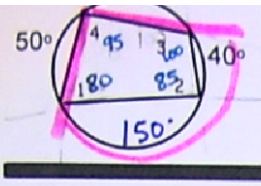
$10y - 28 = 7y - 1$

$3y = 27$

$y = 9$

$7(9) - 1$

62



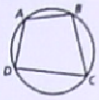
Find:

$m\angle 1 = 80$ $m\angle 3 = 100$

$m\angle 2 = 85$ $m\angle 4 = 95$

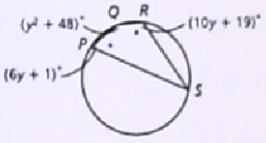
supp

Theorem 12-4-4

THEOREM	HYPOTHESIS	CONCLUSION
If a quadrilateral is inscribed in a circle, then its opposite angles are supplementary.	 ABCD is inscribed in ⊙E.	∠A supp ∠C ∠B supp ∠D

4 **Finding Angle Measures in Inscribed Quadrilaterals**

Find the angle measures of $PQRS$.



$10y + 19 + 6y + 1 = 180$

$16y + 20 = 180$

$16y = 160$

$y = 10$

$m\angle P = 61$

$m\angle Q = 148$

$m\angle R = 119$

$m\angle S = 32$