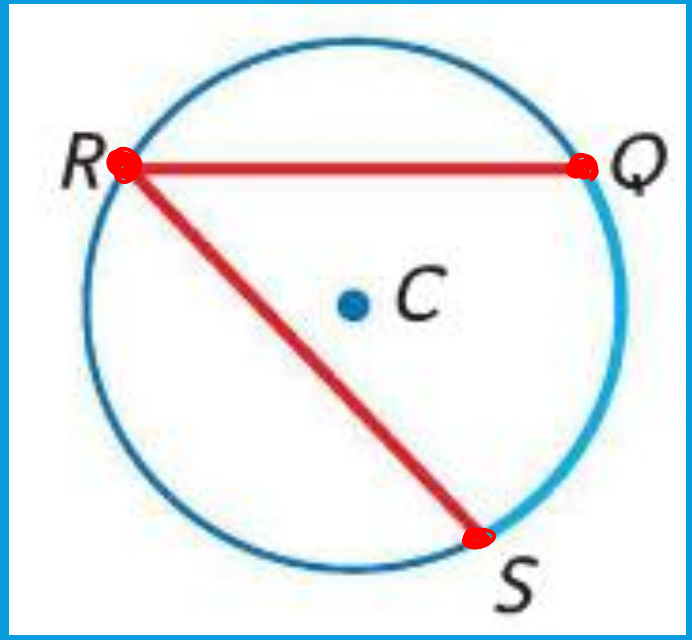
INSCRIBED ANGLES

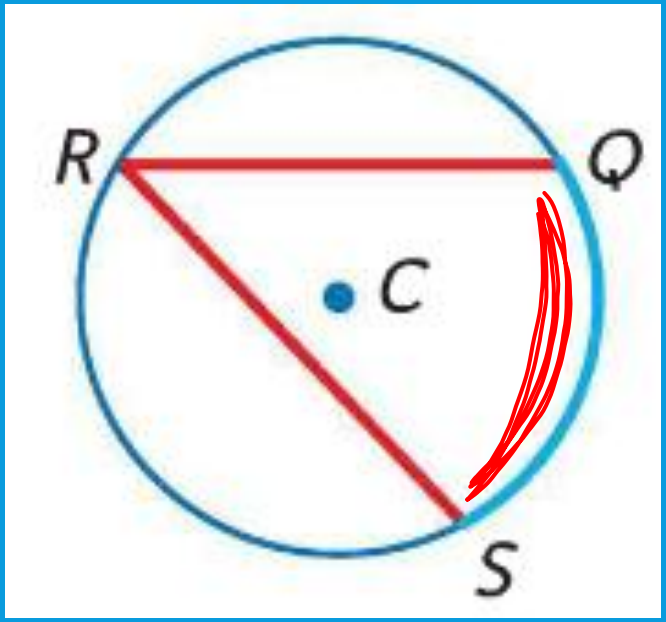
INSCRIBED ANGLES

- An inscribed angle has a vertex on a circle and sides that contain chords of the circle.



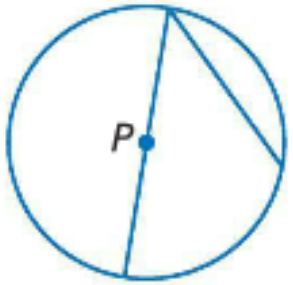
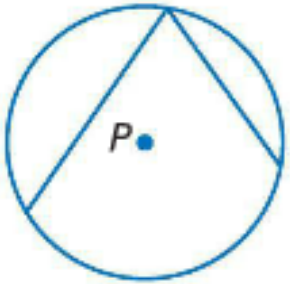
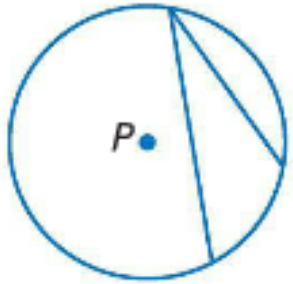
INTERCEPTED ARC

- An intercepted arc has endpoints on the sides of an inscribed angle and lies in the interior of the inscribed angle.



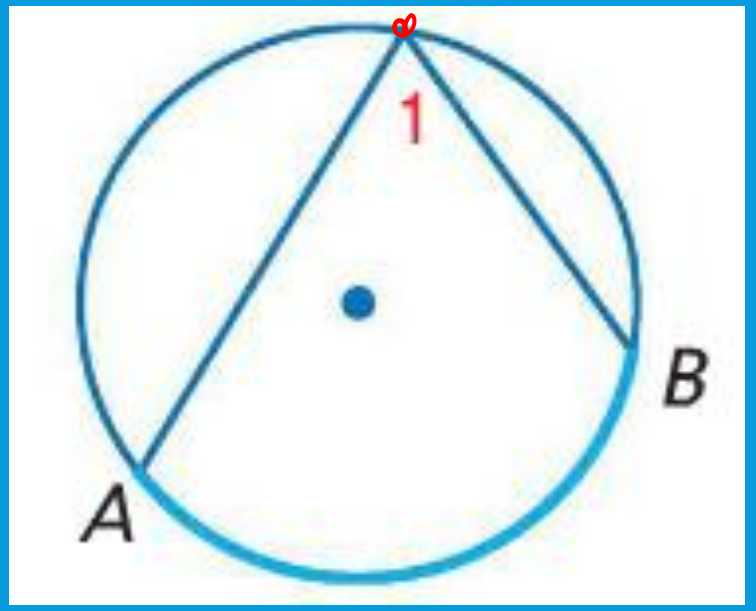
INSCRIBED ANGLE

- There are three ways that an angle can be inscribed in a circle.

Case 1	Case 2	Case 3
		
Center *P* is on a side of the inscribed angle.	Center *P* is inside the inscribed angle.	The center *P* is in the exterior of the inscribed angle.

INSCRIBED ANGLE THEOREM

- If an angle is inscribed in a circle, then the measure of the angle equals one half the measure of its intercepted arc.

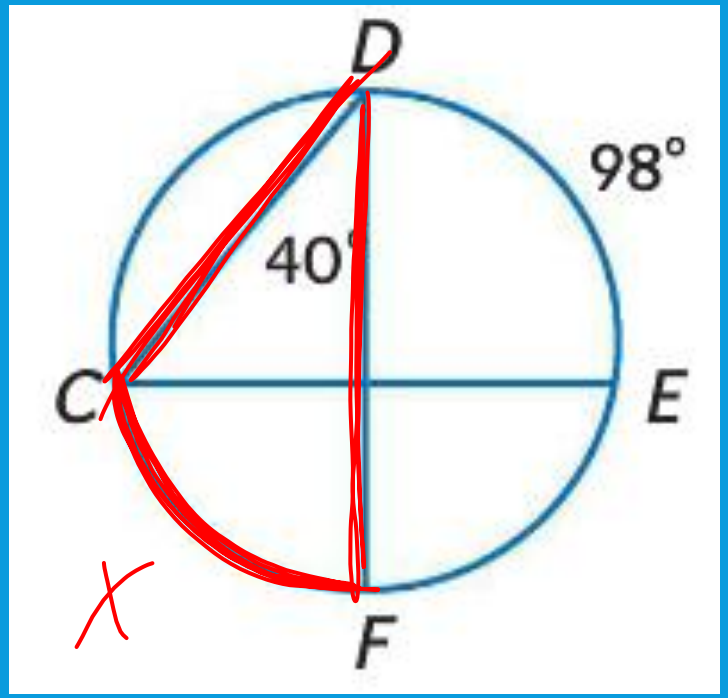


$$m\angle 1 = \frac{1}{2} m\overset{\frown}{AB}$$

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

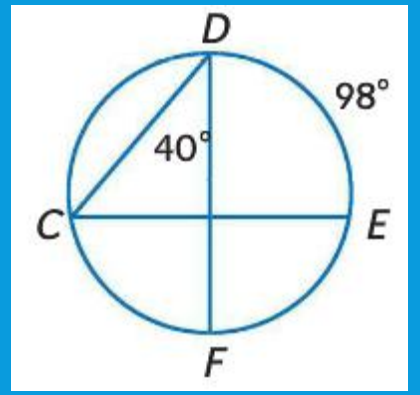
EXAMPLES

- Find each measure.
- $m\widehat{CF}$ 80



EXAMPLES

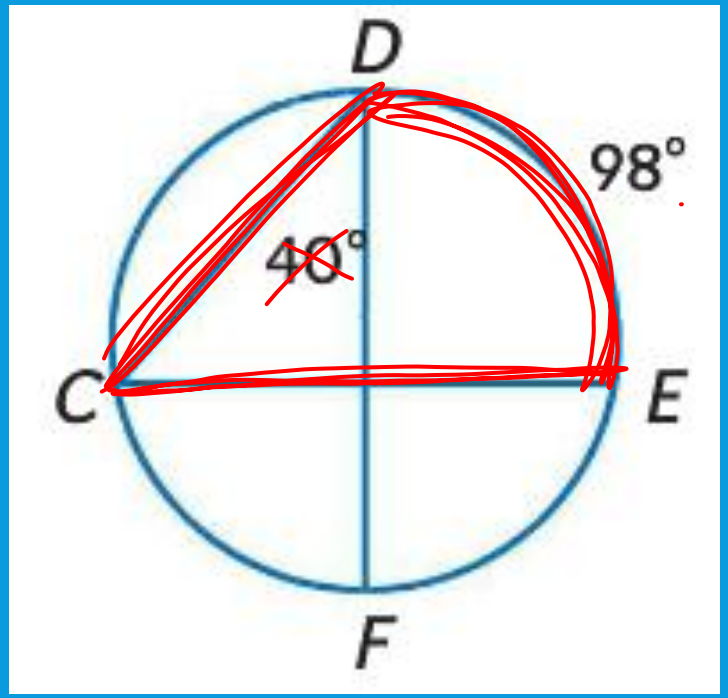
- Find each measure.
- $m\widehat{CF}$



- $m\widehat{CF}$ intercepts $\angle CDF$
- $m\angle CDF = 40$
- $m\widehat{CF} = 2 * 40$
- $m\widehat{CF} = 80$

EXAMPLES

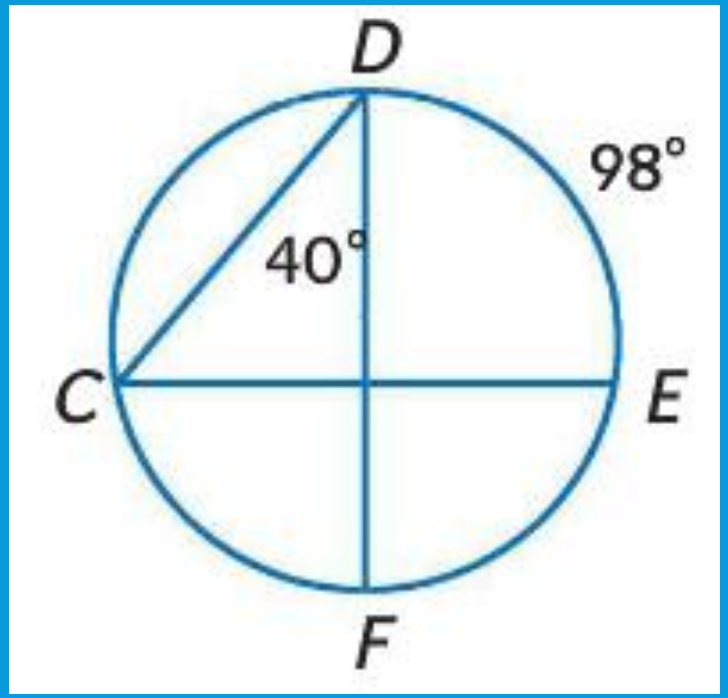
- Find each measure.
- $m\angle C$ = 49



EXAMPLES

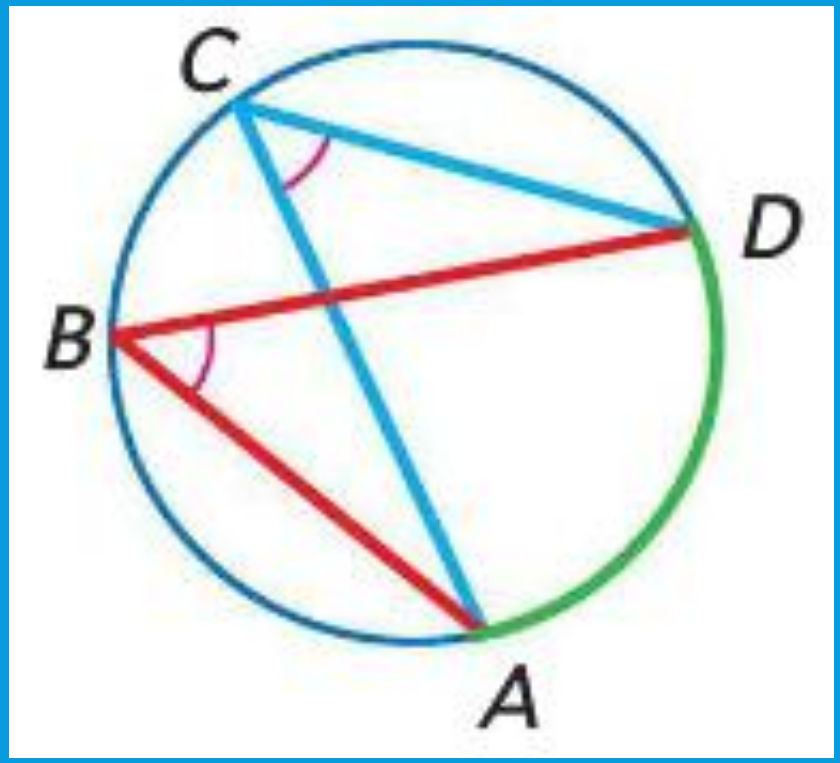
- Find each measure.
- $m\angle C$

- $m\angle C$ intercepts $\widehat{DE}$
- $\widehat{DE} = 98$
- $m\angle C = \frac{1}{2} * 98$
- $m\angle C = 49$



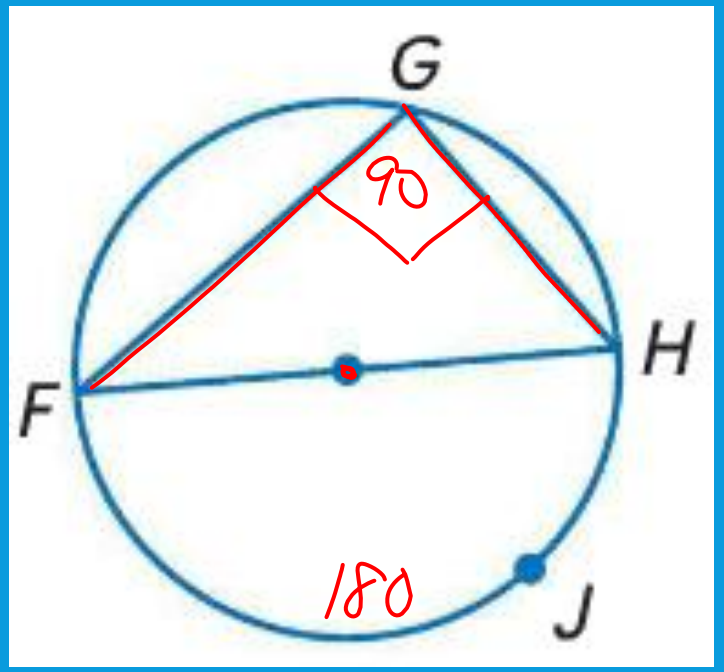
INTERCEPTED ARC THEOREM

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



INSCRIBED TRIANGLE THEOREM

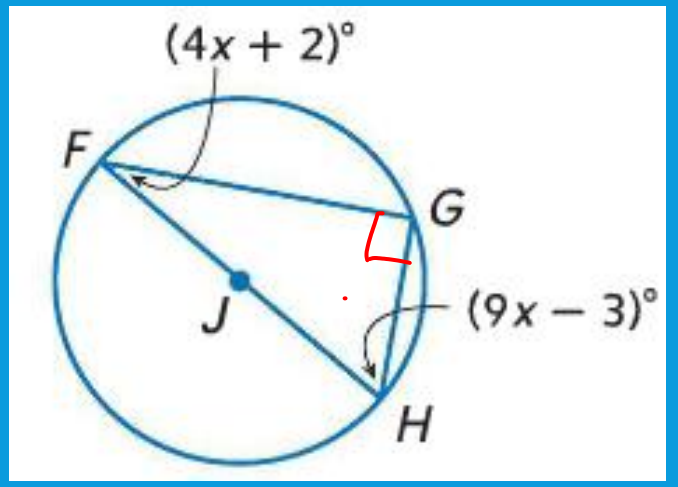
- An inscribed angle of a triangle intercepts a diameter or semicircle if and only if the angle is a right angle.



EXAMPLES

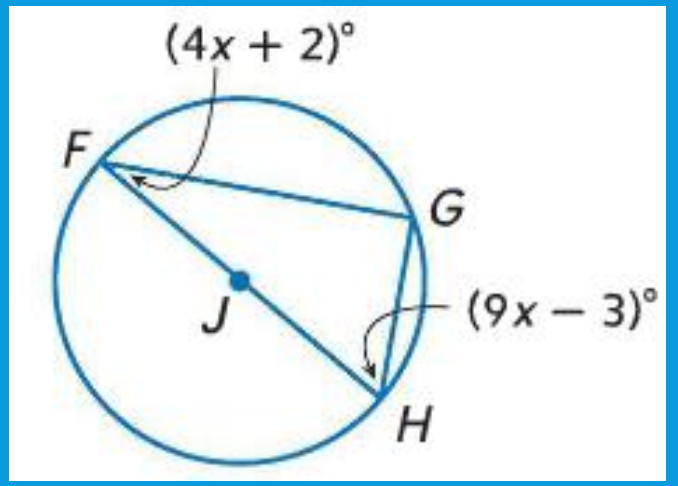
- If $m\angle F = 4x + 2$ and $m\angle H = 9x - 3$, find x.

$4x + 2 + 9x - 3 = 90$



EXAMPLES

- If $m\angle F = 4x + 2$ and $m\angle H = 9x - 3$, find x.



- $m\angle F + m\angle H = 90$
- $4x + 2 + 9x - 3 = 90$
- $13x - 1 = 90$
- $13x = 91$
- $x = 7$

$m\angle G = 90$

Substitute the angles

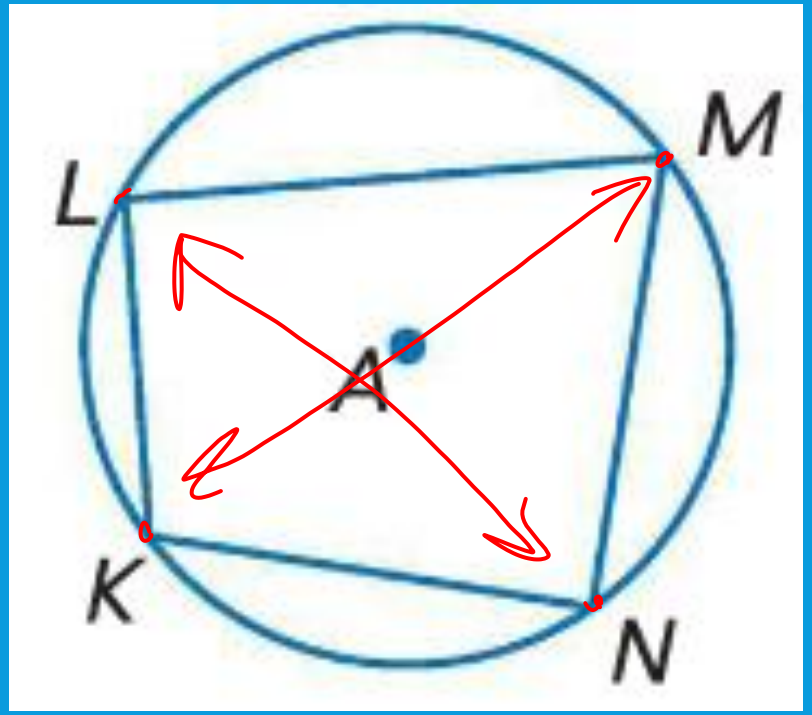
Simplify

Add 1 to both sides

Divide both sides by 13

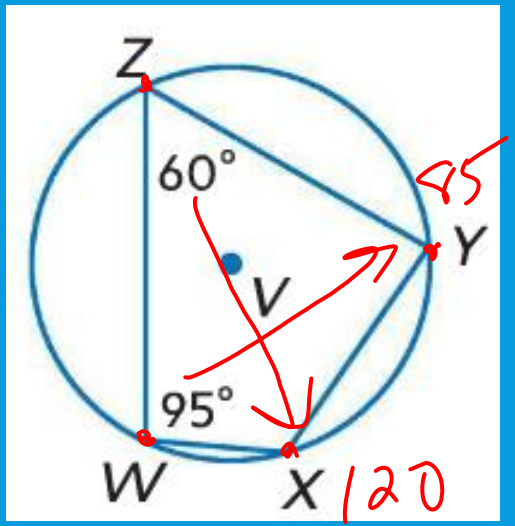
INSCRIBED QUADRILATERAL THEOREM

- If a quadrilateral is inscribed in a circle, then its opposite angles are supplementary



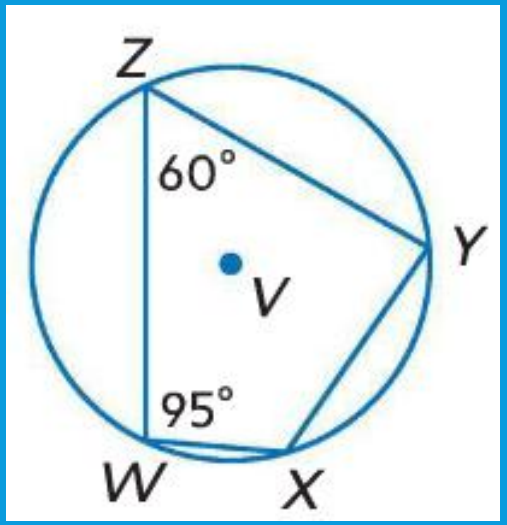
EXAMPLES

- Quadrilateral WXYZ is inscribed in V. find m∠X and m∠Y.



EXAMPLES

- Quadrilateral WXYZ is inscribed in V. find m∠X and m∠Y.



- $m\angle Z + m\angle X = 180$
- $60 + m\angle X = 180$
- $m\angle X = 120$

$m\angle W + m\angle Y = 180$

$95 + m\angle Y = 180$

$m\angle Y = 85$