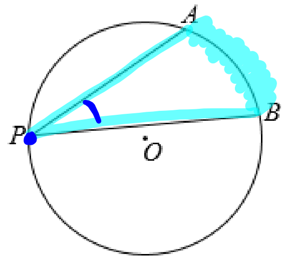
Inscribed Angles



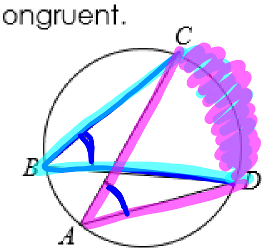
An *inscribed angle of a circle* is an angle whose vertex is on the circle and whose sides are contain chords of the circle.

Theorem: The measure of an inscribed angle is one half the measure of the intercepted arc:

$$m\angle APB = \frac{1}{2} m\overset{\frown}{AB} \quad \text{which also means} \quad m\overset{\frown}{AB} = 2m\angle APB$$

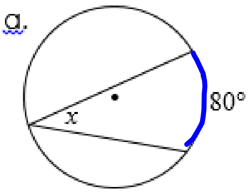
Corollary: If two inscribed angles intercept the same arc, they are congruent.

Corollary: Congruent inscribed angles intercept congruent arcs.

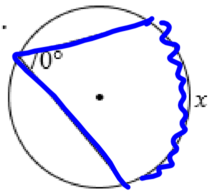


Example 1: Find the measure of x in each diagram.

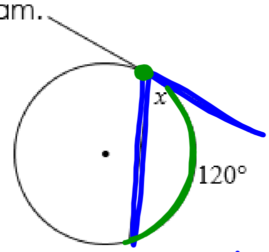
a.



b.



c.



a. $\angle = \frac{1}{2}$ arc

$x = \frac{1}{2}(80)$

$x = 40°$

b. Arc $= 2 \cdot \angle$

Arc $= 2(70)$

Arc $= 140°$

c. $\angle = \frac{1}{2}$ arc

$x = \frac{1}{2}(120)$

$x = 60°$

Example 2: In circle O, $\overline{AOB}$ is a diameter, $m\angle BDC = 30°$ and $m\widehat{AD} = 5x$ and $m\widehat{BD} = 4x$. Find the following

a. $m\angle CAB = 30°$

b. $m\angle CBA = 60°$

$120/2$

c. $m\angle ACD = 50°$

$100/2$

$5x+4x=180$

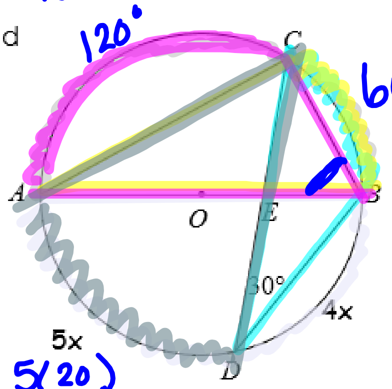
$9x=180$

$x=20$

180−60

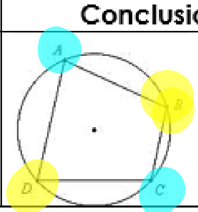
120°

60°



5(20)

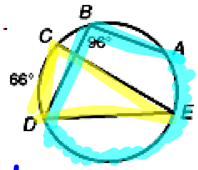
100°

Name	Theorem	Hypothesis	Conclusion
Inscribed Polygons	A polygon whose vertices lie on the circle.	Opposite angles are supplementary.	

$\angle D + \angle B = 180$

$\angle A + \angle C = 180$

1.



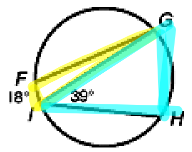
m∠CED = 33°

m$\widehat{DEA}$ = 192°

$\frac{66}{2}$

96 (2) = 192

2.



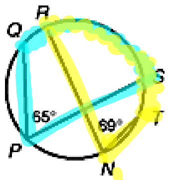
m∠FGI = 9°

m$\widehat{GH}$ = 78°

$\frac{18}{2}$ = 9°

39 (2) = 78°

3.



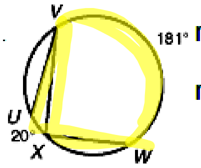
m$\widehat{QRS}$ = 130°

m$\widehat{TSR}$ = 138°

65(2) = 130°

69 (2) = 138°

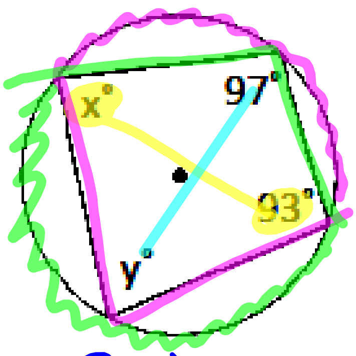
4.



181° m∠XVU = 10°

m∠VXW = 90.5°

15. Solve for x and y.



x = 87° y = 83°

$$y + 97 = 180$$
$$-97 \quad -97$$
$$y = 83^\circ$$

$$x + 93 = 180$$
$$-93 \quad -93$$
$$x = 87^\circ$$