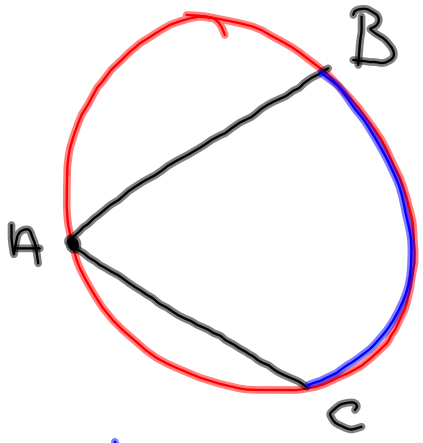
11.4 Inscribed ∠'s

inscribed ∠: ∠ whose vertex is on the circle and whose sides are chords.

intercepted arc: arc formed by the angle.

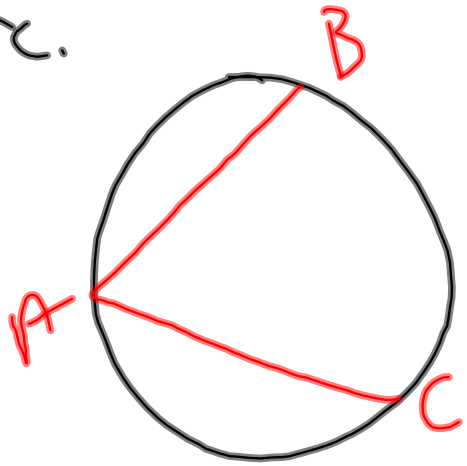


a chord or arc **subtends** an ∠ if its endpts. lie on the side of the ∠.

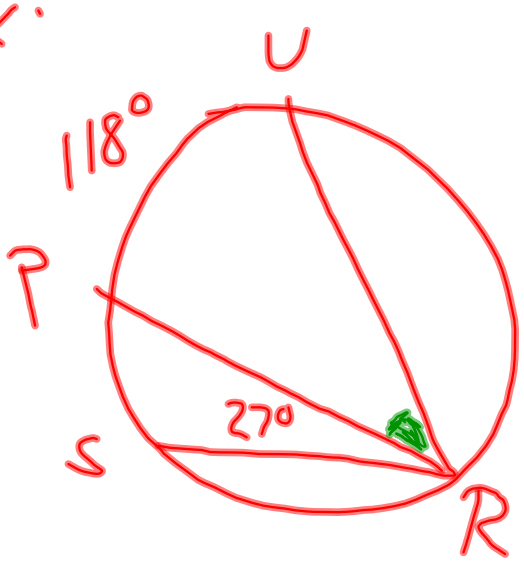
Theorem 11-4-1:

The measure of an inscribed $\angle$ is $\frac{1}{2}$ the measure of the intercepted arc.

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



Ex:



Find $m\angle PRU$

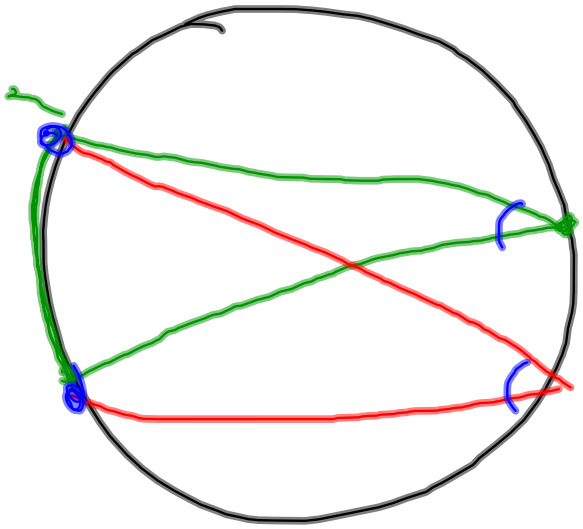
$= \frac{118}{2}$

$= 59°$

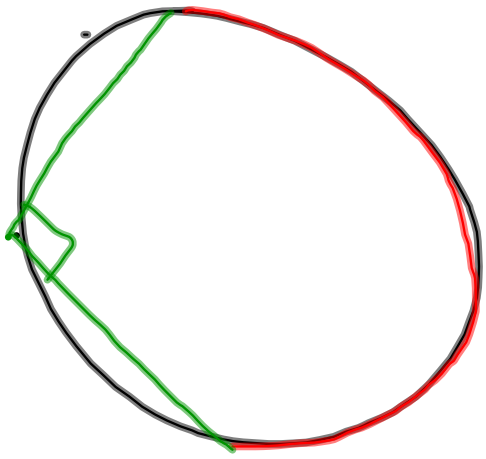
Find $m\overset{\frown}{SP}$

$27 \cdot 2 = 54°$

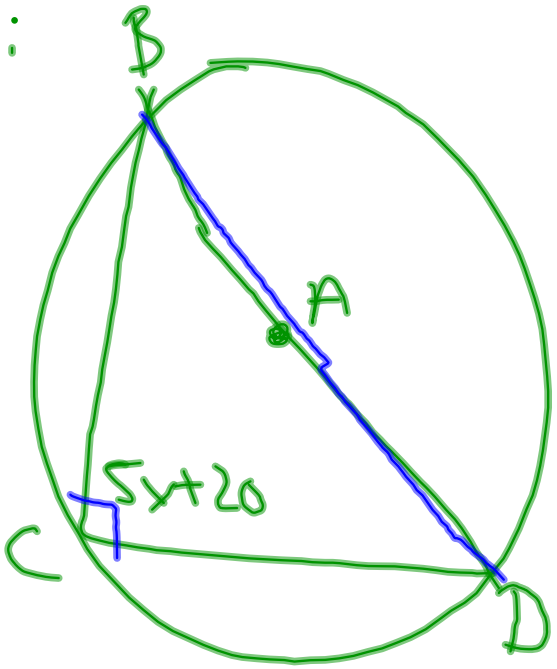
Corollary: if inscribed $\angle$'s of a circle intercept the same arc or are subtended by the same chord, then the $\angle$'s are $\cong$.



Theorem 11-4-3: An inscribed $\angle$ subtends a semicircle iff the $\angle$ is a rt. $\angle$.



Ex:



Find x

$90 = 5x + 20$

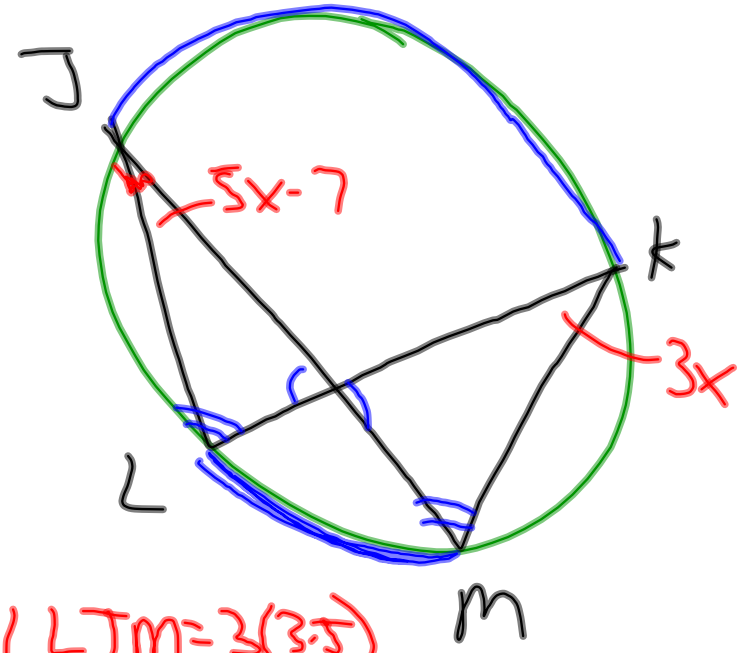
$-20 \quad -20$

$70 = 5x$

$\frac{70}{5} = \frac{5x}{5}$

$x = 14$

Find m∠LJM



$3x = 5x - 7$

$-3x \quad -3x$

$2x - 7 = 0$

$+7 \quad +7$

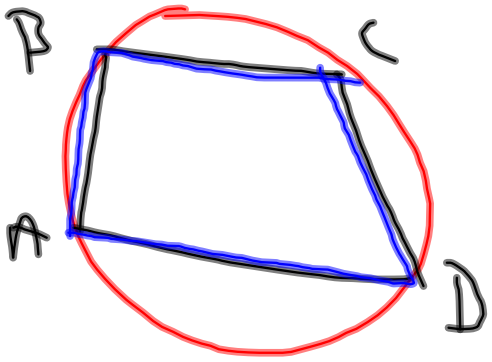
$\frac{2x}{2} = \frac{7}{2}$

$x = 3.5$

$m\angle LJM = 3(3.5)$

$= 10.5°$

Theorem 11-4-4: if a quadrilateral is inscribed in a circle, then its opposite $\angle$'s are supplementary

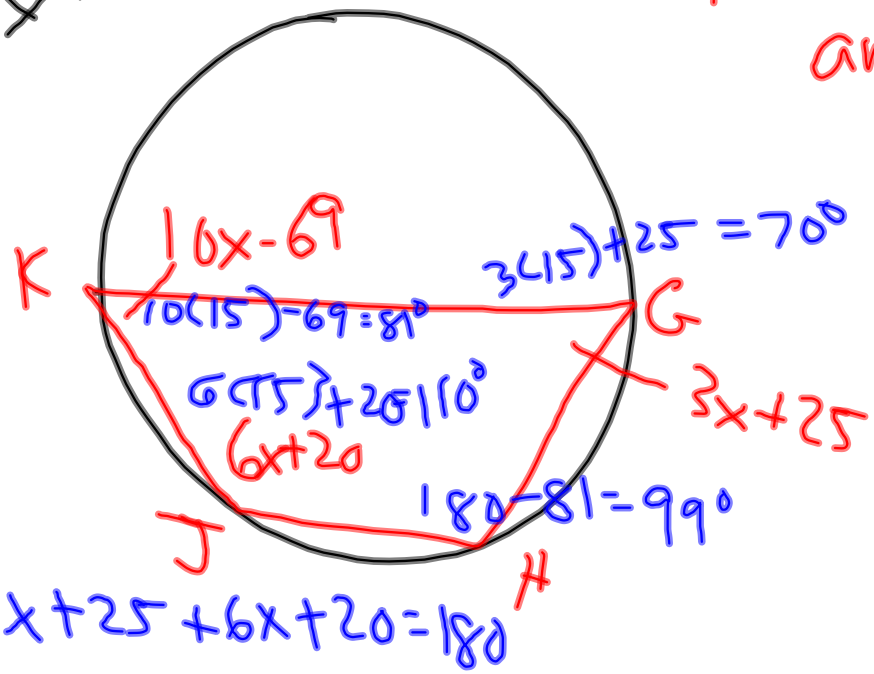


$\angle B$ & $\angle D$ are supp.

$\angle A$ & $\angle C$ are supp.

Ex:

Find all the angles.



$3x+25+6x+20=180$

$9x+45=180$

$-45 \quad -45$

$\frac{9x}{9}=\frac{135}{9}$

$x=15$

p. 776

1-27all