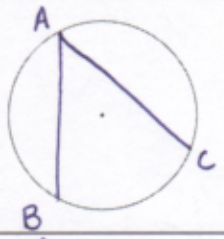
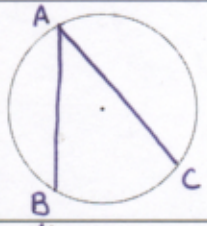
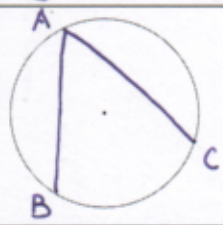
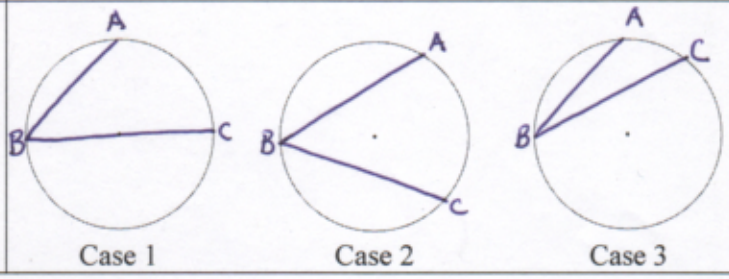
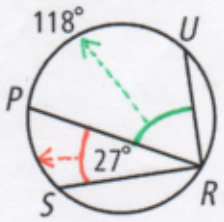
Key

Geometry: 11.4 Notes

Inscribed angle: an angle whose vertex is on the circle and whose sides contain chords of the circle	 ∠BAC is the inscribed angle.
Intercepted arc: Consists of endpoints that lie on the sides of an inscribed angle and all the points of the circle between them	 $\overset{\frown}{BC}$ is the intercepted arc.
A chord or arc subtends an angle if its endpoints lie on the sides of the angle	 $\overset{\frown}{BC}$ subtends ∠BAC.
The measure of an inscribed angle is equal to half the measure of the arc	 Case 1 Case 2 Case 3

Example 1: Find each measure.



a. m∠PRU

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

$= \frac{1}{2}(118)$

$= 59°$

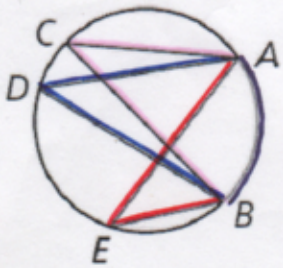
b. measure of arc SP

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

$27 = \frac{1}{2} m\overset{\frown}{SP}$

$54° = m\overset{\frown}{SP}$

Inscribed angles that intercept the same arc are congruent.

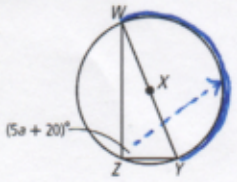


∠ACB, ∠ADB, and ∠AEB intercept $\overset{\frown}{AB}$.

∠ACB ≅ ∠ADB ≅ ∠AEB

(and ∠CAE ≅ ∠CBE)

Example 2: Find each value.



b. Find a.

$\overline{WY}$ is a diameter

so $\overset{\frown}{WY} = 180°$

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

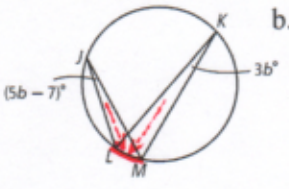
$= \frac{1}{2}(180)$

$= 90°$

$5a + 20 = 90$

$5a = 70$

$\boxed{a = 14}$



b. Find $m\angle LJM$

$m\angle LJM = m\angle LKM$

$5b - 7 = 36$

$2b - 7 = 0$

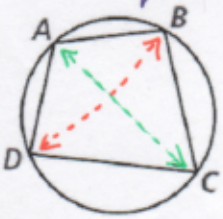
$2b = 7$

$b = 7/2$ or 3.5

$m\angle LJM = 5(3.5) - 7$

$\boxed{= 10.5}$

Theorem: If a quadrilateral is inscribed in a circle, then its opposite angles are supplementary.

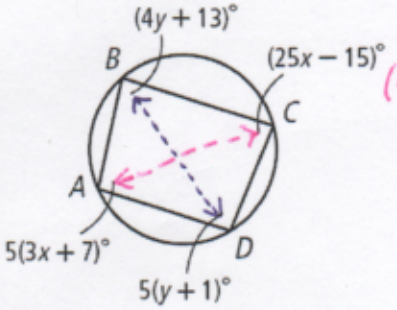


$\angle A$ and $\angle C$ are supplementary

$\angle B$ and $\angle D$ are supplementary.

ABCD is inscribed in ⊙*E*.

Example 3: Find the angle measures of ∠A and ∠B.



$m\angle A + m\angle C = 180°$

$(5(3x+7)) + (25x - 15) = 180$

$(15x + 35) + (25x - 15) = 180$

$40x + 20 = 180$

$40x = 160$

$x = 4$

$m\angle A = 5(3(4)+7)$

$= 5(19)$

$\boxed{= 95°}$

$m\angle B + m\angle D = 180°$

$(4y+13) + (5(y+1)) = 180°$

$(4y+13) + (5y+5) = 180°$

$9y + 18 = 180°$

$9y = 162°$

$y = 18$

$m\angle B = 4(18) + 13$

$\boxed{= 85°}$