2(Exterior Angle) = major arc − minor arc

Name: _Schlansky_   Date: _____
Mr. Schlansky   Geometry

Exterior Angles in Circles

1. Major arc $\overarc{AB}$ = 200°, Minor arc $\overarc{AB}$ = 160°, find m $\angle$ APB

$2(EA) = major - minor$
$2x = 200 - 160$
$2x = 40$
$\dfrac{2}{2}x = \dfrac{40}{2}$
$x = 20$

$\angle APB = 20°$
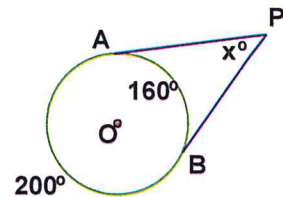
2. $\overarc{AC}$ = 150°, $\overarc{AH}$ = 70°, find m $\angle$ APH

$2(EA) = major - minor$
$2x = 150 - 70$
$\dfrac{2}{2}x = \dfrac{80}{2}$
$x = 40°$

$\angle APH = 40°$
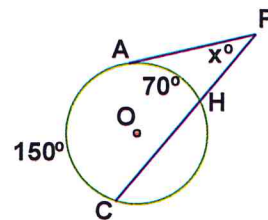
3. $\overarc{TL}$ = 140°, $\overarc{LK}$ = 120°, find m $\angle$ TPK

The arcs of a circle add to 360°
$140 + 120 + x = 360$
$260 + x = 360$
$\overarc{TK}$ $-260 \quad -260$
$x = 100$

$2(EA) = major - minor$
$2x = 140 - 100$
$\dfrac{2}{2}x = \dfrac{40}{2}$
$x = 20$

$\angle TPK = 20°$
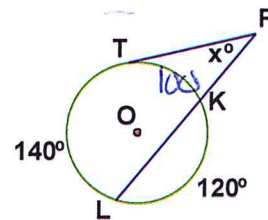
4. $\overarc{TN}$ = 50°, $\angle$ TPN = 20°, find $\overarc{AS}$

$2(EA) = major - minor$
$2(20) = x - 50$
$40 = x - 50$
$+50 \quad +50$
$90 = x$

$\overarc{AS} = 90°$
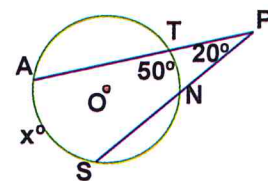
5. $\overarc{SC}$ = 180°, $\angle$ SPA = 30°, find $\overarc{AS}$

$2(EA) = major - minor$
$2(30) = 180 - x$
$60 = 180 - x$
$-180 \quad -180$
$-120 = -x$
$\dfrac{-120}{-1} = \dfrac{-x}{-1}$
$120 = x$

$\overarc{AS} = 120°$
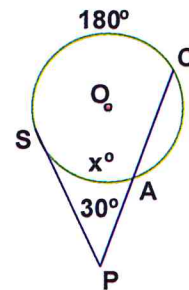
6. In the diagram below of circle C, $m\overarc{QT} = 140$, and $m\angle P = 40$. What is $m\overarc{RS}$?
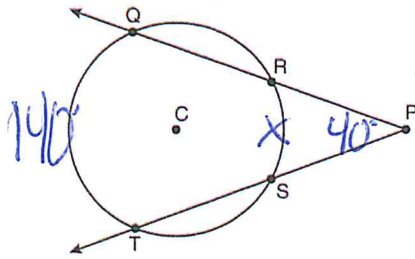
$2(EA) = major - minor$

$2(40) = 140 - x$

$\begin{array}{l} 80 = 140 - x \\ -140 \quad -140 \\ \hline \dfrac{-60}{-1} = \dfrac{-x}{-1} \end{array}$

$\rightarrow x = 60$

$\overarc{RS} = 60°$

7. In the diagram below, $\overline{PS}$ is a tangent to circle O at point S, $\overline{PQR}$ is a secant, $m\angle QPS = 35$, $\overarc{QS} = 80$, find $m\overarc{RS}$
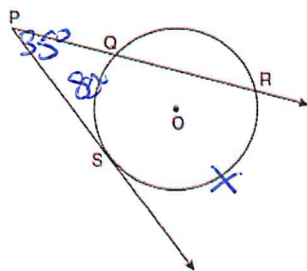
$2(EA) = major - minor$

$2(35) = X - 80$

$\begin{array}{l} 70 = X - 80 \\ +80 \quad +80 \end{array}$

$150° = X$

$\overarc{RS} = 150°$

(Not drawn to scale)

8. In the diagram below, tangent $\overline{PA}$ and secant $\overline{PBC}$ are drawn to circle O from external point P. If $\overarc{AC} = 120$ and $\overarc{AB} = 80$, find $m\angle APB$
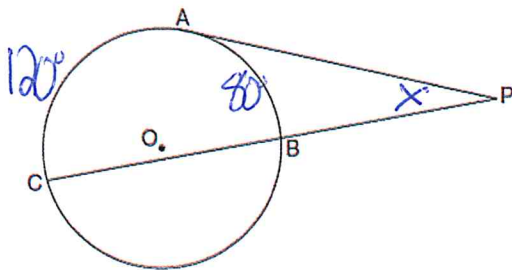
$2(EA) = major - minor$
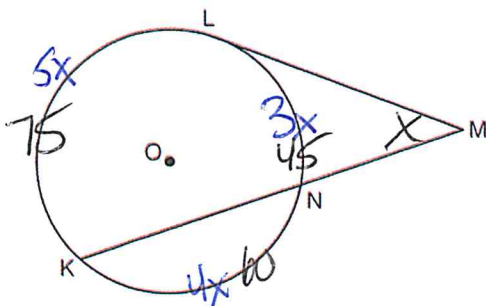
$2x = 120 - 80$

$\dfrac{2x}{2} = \dfrac{40}{2}$

$x = 20$

$\angle APB = 20°$

9. In the diagram below, tangent $\overline{ML}$ and secant $\overline{MNK}$ are drawn to circle O. The ratio $m\overarc{LN} : m\overarc{NK} : m\overarc{KL}$ is $3:4:5$. Find $m\angle LMK$.

The arcs of a circle add to 360

$5x + 4x + 3x = 180$

$\dfrac{12x}{12} = \dfrac{180}{12}$

$X = 15$

$5(15) = 75°$
$4(15) = 60°$
$3(15) = 45°$

$2(EA) = major - minor$

$2x = 75 - 45$

$\dfrac{2x}{2} = \dfrac{30}{2}$

$X = 15$

$\angle LMK = 15$