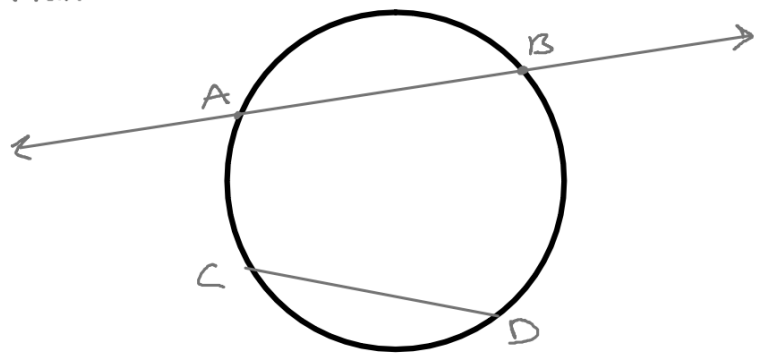
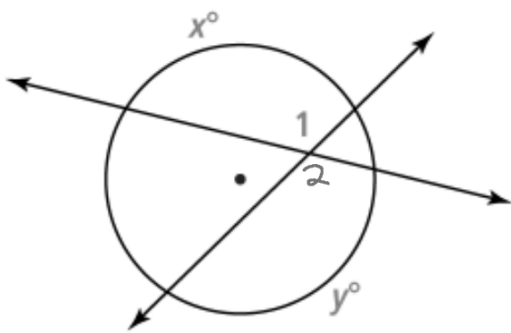


Secant - Line that intersects a circle at 2 different points



The measure of an angle formed by two secant lines that intersect inside a circle is half the sum of the measures of the intercepted arcs.

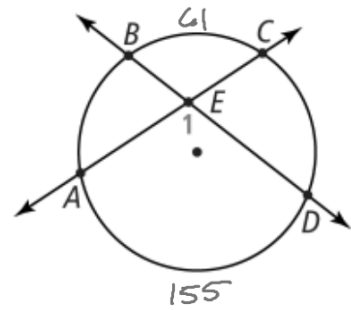
If...



Then... $m\angle 1 = \frac{1}{2}(x + y)$

1. If $m\widehat{AD} = 155$ and $m\widehat{BC} = 61$, what is $m\angle 1$?

$$\begin{aligned} m\angle 1 &= \frac{155 + 61}{2} \\ &= \frac{216}{2} \\ m\angle 1 &= 108 \end{aligned}$$

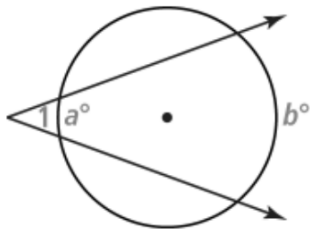


The measure of an angle formed by two lines that intersect outside a circle is half the difference of the measures of the intercepted arcs.

Consider the first case.

Case 1

If...



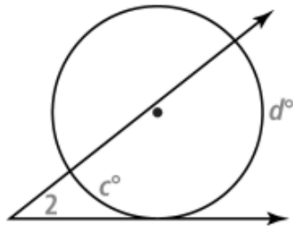
Then... $m\angle 1 = \frac{1}{2}(b - a)$

The measure of an angle formed by two lines that intersect outside a circle is half the difference of the measures of the intercepted arcs.

Consider the second case.

Case 2

If...



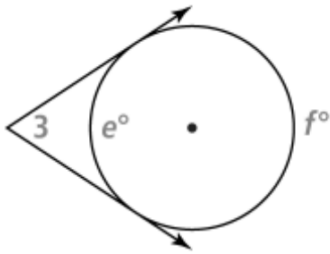
Then... $m\angle 2 = \frac{1}{2}(d - c)$

The measure of an angle formed by two lines that intersect outside a circle is half the difference of the measures of the intercepted arcs.

Consider the third case.

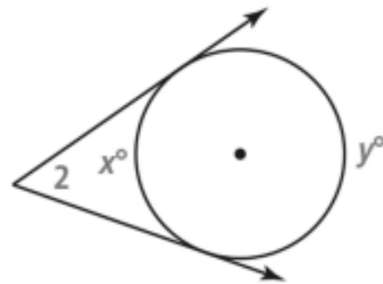
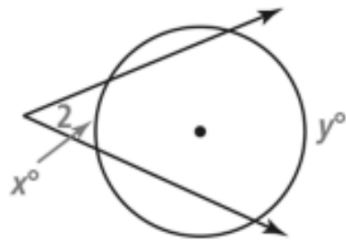
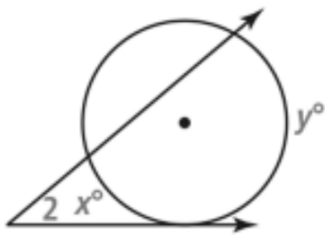
Case 3

If...



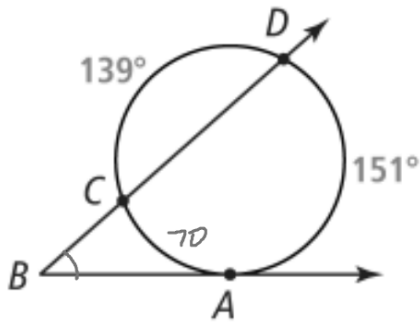
Then... $m\angle 3 = \frac{1}{2}(f - e)$

Vertex Outside the Circle



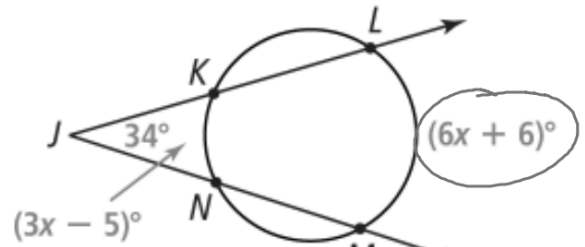
$$m\angle 2 = \frac{1}{2}(y^\circ - x^\circ)$$

What is $m\angle ABD$?



$$\begin{aligned}
 m\angle ABD &= \frac{\widehat{AD} - \widehat{AC}}{2} \\
 &= \frac{151 - 70}{2} \\
 &= 40.5
 \end{aligned}$$

B. What is $m\widehat{LM}$? $\angle(19) + 6$
 120°



$$\begin{aligned}
 m\angle J &= \frac{m\widehat{LM} - m\widehat{NK}}{2} \\
 34 &= \frac{6x + 6 - (3x - 5)}{2}
 \end{aligned}$$

$$2(34) = \left(\frac{3x + 11}{2}\right) 2$$

$$\begin{array}{r}
 68 = 3x + 11 \\
 -11 \quad -11 \\
 \hline
 \end{array}$$

$$57 = 3x$$

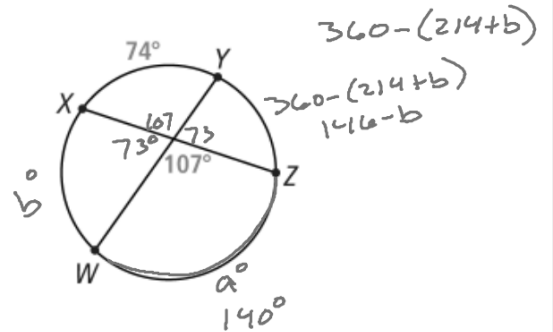
$$x = 19$$

3. a. What is $m\widehat{WX}$?

Enter your answer.

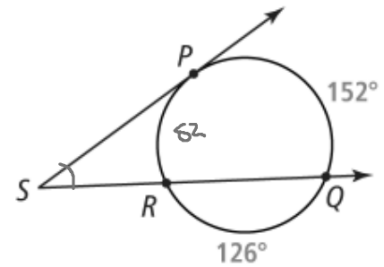
$$107 = \frac{74 + a}{2}$$

$$214 = 74 + a$$

$$140 = a$$


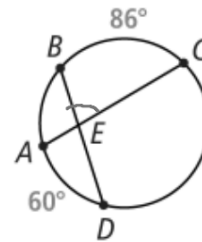
3. b. What is $m\angle PSQ$?

Enter your answer $m\angle PSQ = \frac{152 - 82}{2}$
 $= 35^\circ$



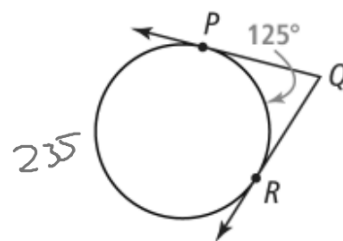
5. Find $m\angle BEC$.

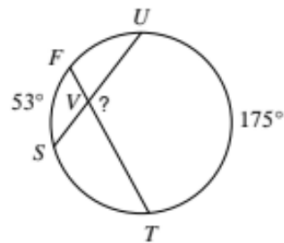
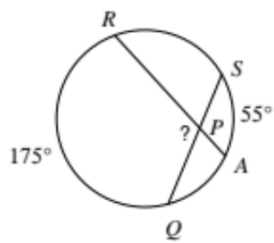
Enter your answer. $m\angle BEC = \frac{86+60}{2}$
 $= \frac{146}{2}$
 $= 73^\circ$



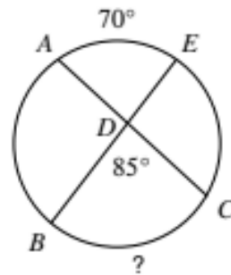
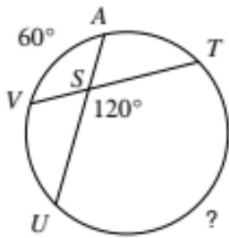
6. Rays QP and QR are tangent to the circle in the figure shown. Find $m\angle PQR$.

Enter your answer $m\angle PQR = \frac{235 - 125}{2}$
 $= \frac{110}{2} = 55^\circ$

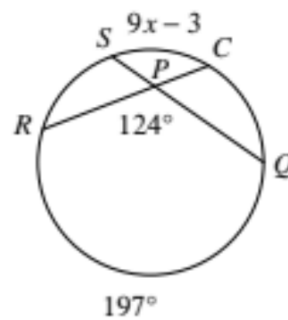
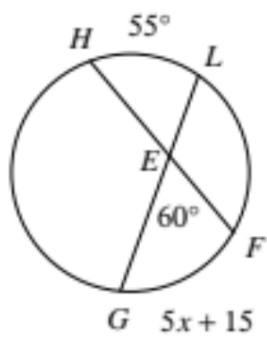




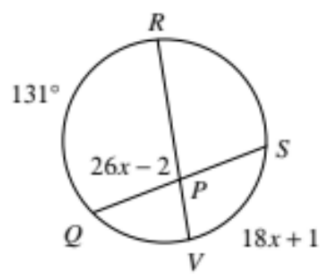
$$\begin{aligned} \text{m}\angle UVT &= \frac{175 + 53}{2} \\ &= \frac{228}{2} \\ &= 114 \end{aligned}$$



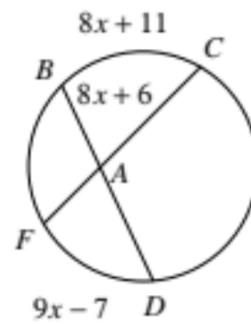
$$\begin{aligned} 85 &= \frac{70 + x}{2} \\ 170 &= 70 + x \\ x &= 100^\circ \end{aligned}$$

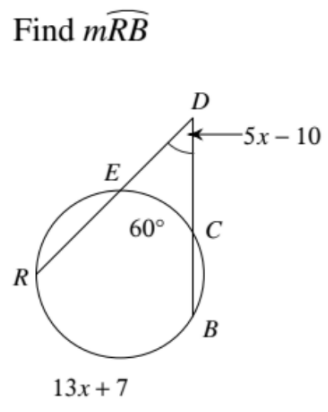
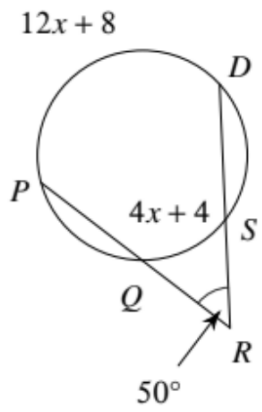
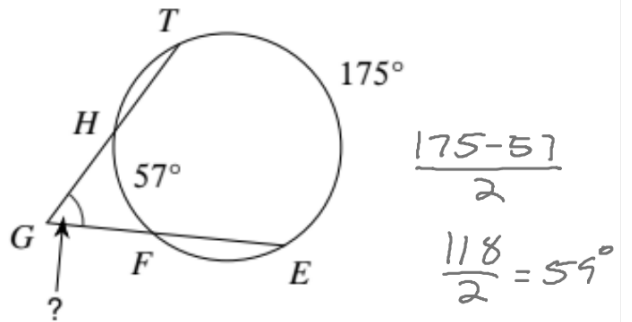
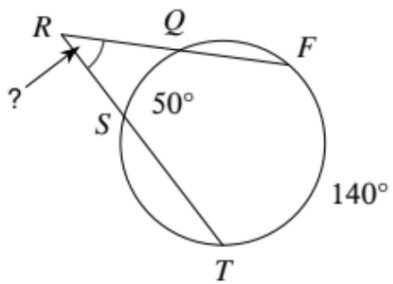


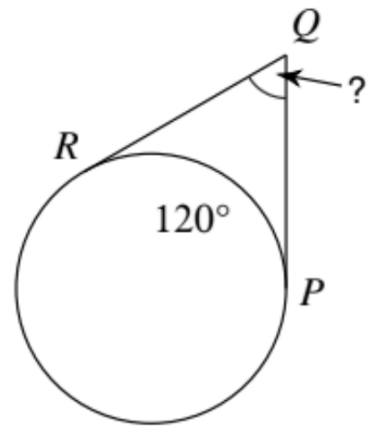
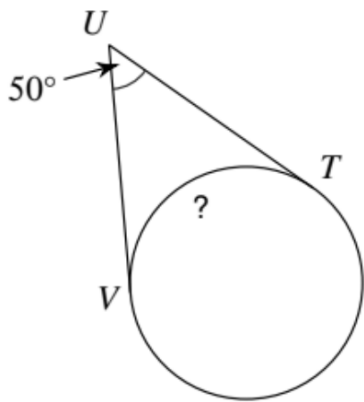
Find $m\angle QPR$

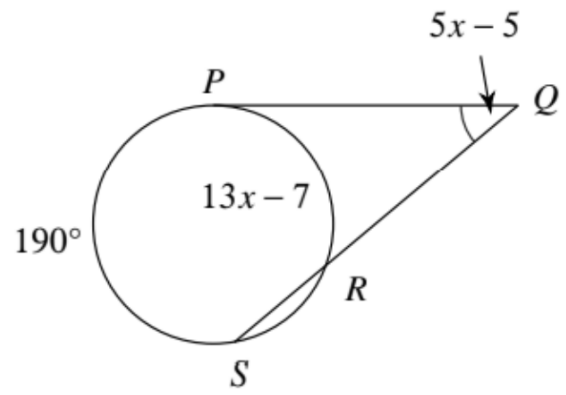
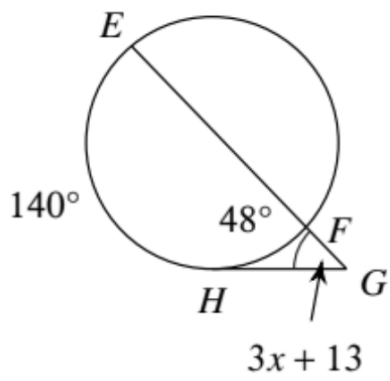


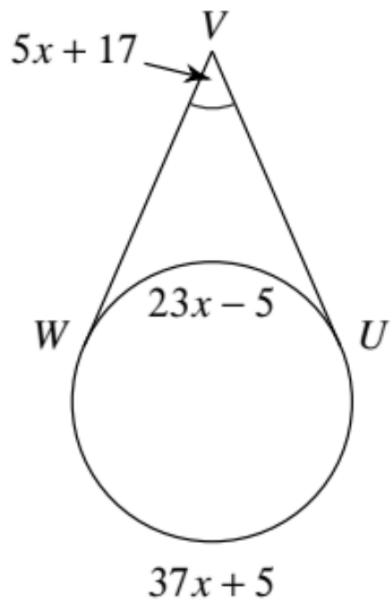
Find $m\widehat{BC}$











16) Find $m\angle DEG$

