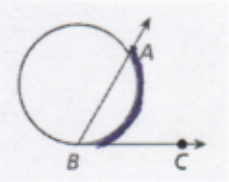
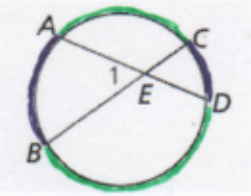
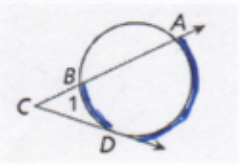
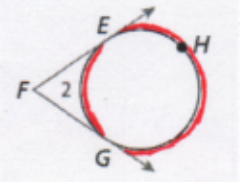
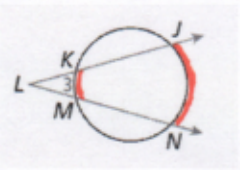
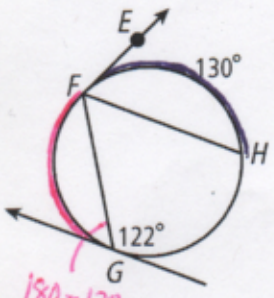
Geometry: 11.5 Notes

Key

Vertex **ON** the circle	The measure of the angle is *half* the measure of the *intercepted arc*.		$m\angle ABC = \frac{1}{2}(m\overset{\frown}{AB})$
Vertex **INSIDE** the circle	The measure of the angle is *half* the *sum* of the measures of the two *intercepted arcs*.		$m\angle AEB = \frac{1}{2}(m\overset{\frown}{AB} + m\overset{\frown}{CD})$ $m\angle CED = \frac{1}{2}(m\overset{\frown}{AB} + m\overset{\frown}{CD})$ $m\angle CEA = \frac{1}{2}(m\overset{\frown}{AC} + \overset{\frown}{BD})$ $m\angle BED = \frac{1}{2}(m\overset{\frown}{AC} + \overset{\frown}{BD})$
Vertex **OUTSIDE** the circle	The measure of the angle is *half* the *difference* of the measures of the two *intercepted arcs*.	  	angle $= \frac{1}{2}$ (outside − inside) $m\angle ACD = \frac{1}{2}(m\overset{\frown}{AD} - m\overset{\frown}{BD})$ $m\angle EFG = \frac{1}{2}(m\overset{\frown}{EHG} - m\overset{\frown}{EG})$ $m\angle JLN = \frac{1}{2}(m\overset{\frown}{JN} - m\overset{\frown}{KM})$

Examples:

1. Find m∠EFH and measure of arc GF



180 − 122 = 58°

$m\angle EFH = \frac{1}{2}(m\overset{\frown}{FH})$

$= \frac{1}{2}(130)$

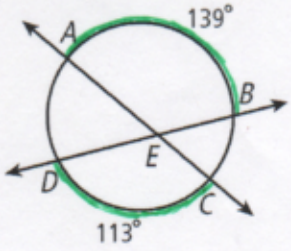
$= 65°$

$m\angle FG? = \frac{1}{2}(m\overset{\frown}{GF})$

$58 = \frac{1}{2}(m\overset{\frown}{GF})$

$116° = m\overset{\frown}{GF}$

2. m∠AEB



$m\angle AEB = \frac{1}{2}(m\overset{\frown}{AB} + m\overset{\frown}{DC})$

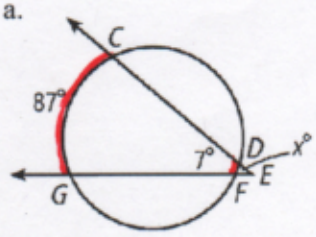
$= \frac{1}{2}(139 + 113)$

$= \frac{1}{2}(252)$

$= 126°$

3. Find the value of x.

a.



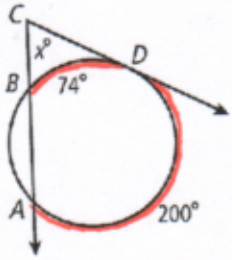
$m\angle CEG = \frac{1}{2}(m\overset{\frown}{CG} - m\overset{\frown}{DF})$

$= \frac{1}{2}(87 - 7)$

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

$= 40°$

b.



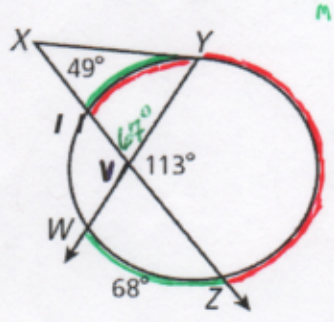
$m\angle ACD = \frac{1}{2}(m\overset{\frown}{DA} - m\overset{\frown}{BD})$

$= \frac{1}{2}(200 - 74)$

$= \frac{1}{2}(126)$

$= 63°$

4. Find measure of arc YZ.



$180 - 113 = 67°$

$m\angle YVX = \frac{1}{2}(m\overset{\frown}{WZ} + m\overset{\frown}{YI})$

$67 = \frac{1}{2}(68 + m\overset{\frown}{YI})$

$134 = 68 + m\overset{\frown}{YI}$

$66° = m\overset{\frown}{YI}$

$m\angle IXY = \frac{1}{2}(m\overset{\frown}{YZ} - m\overset{\frown}{IY})$

$49 = \frac{1}{2}(m\overset{\frown}{YZ} - 66)$

$98 = m\overset{\frown}{YZ} - 66$

$164° = m\overset{\frown}{YZ}$