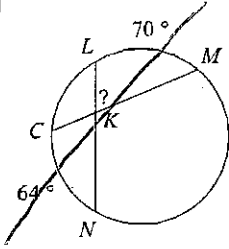
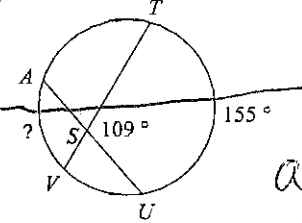
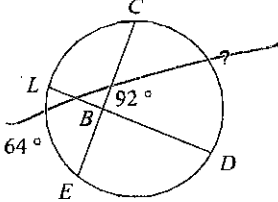


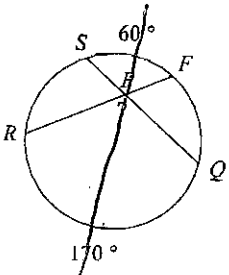
Vertex Inside

Find the measure of the arc or angle indicated. Assume that lines which appear tangent are tangent.

1)  $\frac{\text{arc} + \text{arc}}{2} = \text{angle}$
 $\frac{70 + 64}{2} = \text{angle}$
 $\frac{134}{2} = \text{angle}$
 $\boxed{67^\circ}$

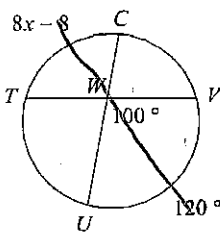
2)  $\frac{\text{arc} + \text{arc}}{2} = \text{angle}$
 $\frac{155 + x}{2} = 109$
 $155 + x = 218$
 $-155 \quad -155$
 $x = 63^\circ$

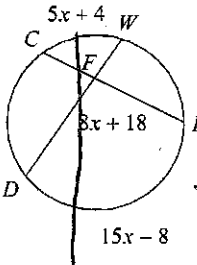
3)  $\frac{\text{arc} + \text{arc}}{2} = \text{angle}$

4)  $\frac{\text{arc} + \text{arc}}{2} = \text{angle}$
 $\frac{60 + 170}{2} = \text{angle}$
 $\frac{230}{2} = \text{angle}$
 $\boxed{115^\circ}$

$\frac{64 + x}{2} = 92 \rightarrow 64 + x = 184$
 $-64 \quad -64$
 $x = 120^\circ$

Solve for x. Assume that lines which appear tangent are tangent.

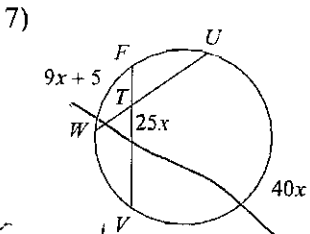
5)  $\frac{\text{arc} + \text{arc}}{2} = \text{angle}$
 $\frac{8x - 8 + 120}{2} = 100$
 $8x + 112 = 100$

6)  $\frac{5x + 4 + 15x - 8}{2} = 8x + 18$
 $\frac{20x - 4}{2} = (8x + 18)$
 $20x - 4 = 16x + 36$
 $-16x + 4 \quad -16x + 4$
 $4x = 40$
 $x = 10$

$200 = 8x + 112$
 $-112 \quad -112$
 $8x = 88$
 $x = 11$

$x = 10$

$\frac{18}{3} = 6$



$$\frac{\text{arc} + \text{arc}}{2} = \text{angle}$$

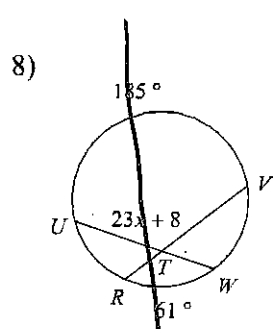
$$\frac{40x + 9x + 5}{2} = 25x$$

$$\frac{49x + 5}{2} = 25x$$

$$50x = 49x + 5$$

$$-49x \quad -49x$$

$$x = 5$$



$$\frac{185 + 61}{2} = \frac{23x + 8}{2}$$

$$123 = 23x + 8$$

$$-8 \quad -8$$

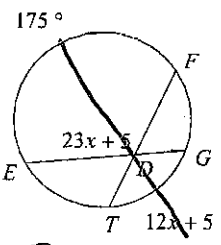
$$115 = 23x$$

$$\frac{115}{23} = \frac{23x}{23}$$

$$x = 5$$

Find the measure of the arc or angle indicated. Assume that lines which appear tangent are tangent.

9) Find $m\widehat{GT}$



$$\frac{175 + 12x + 5}{2} = 23x + 5$$

$$\frac{180 + 12x}{2} = 23x + 5$$

$$180 + 12x = 46x + 10$$

$$-10 \quad -12x \quad -12x \quad -10$$

$$\frac{170}{34} = \frac{34x}{34}$$

$$x = 5$$

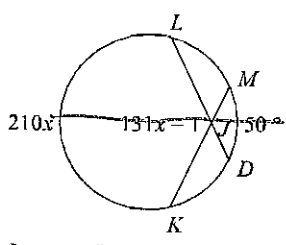
$$m\widehat{GT} = 12x + 5$$

$$= 12(5) + 5$$

$$= 60 + 5$$

$$= 65^\circ$$

10) Find $m\angle KJL$



$$\frac{210x + 50}{2} = \frac{131x - 1}{2}$$

$$210x + 50 = 262x - 2$$

$$-210x \quad -210x$$

$$52 = 52x - 2$$

$$+2 \quad +2$$

$$54 = 52x$$

$$\frac{54}{52} = \frac{52x}{52}$$

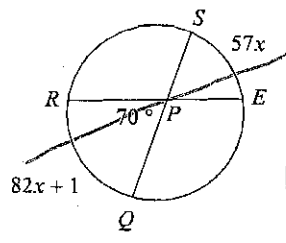
$$x = 1$$

$$m\angle KJL = 131x - 1$$

$$= 131(1) - 1$$

$$= 130^\circ$$

11) Find $m\widehat{QR}$



$$\frac{82x + 1 + 57x}{2} = 70$$

$$\frac{139x + 1}{2} = 70$$

$$139x + 1 = 140$$

$$-1 \quad -1$$

$$139x = 139$$

$$\frac{139x}{139} = \frac{139}{139}$$

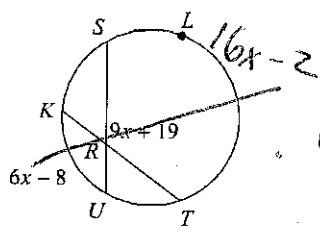
$$x = 1$$

$$m\widehat{QR} = 82x + 1$$

$$= 82(1) + 1$$

$$= 83^\circ$$

12) $m\widehat{SLT} = 16x - 2$
Find $m\widehat{SLT}$



$$\frac{6x - 8 + 16x - 2}{2} = 9x + 19$$

$$\frac{22x - 10}{2} = 9x + 19$$

$$22x - 10 = 18x + 38$$

$$-18x \quad -18x$$

$$4x - 10 = 38$$

$$+10 \quad +10$$

$$4x = 48$$

$$\frac{4x}{4} = \frac{48}{4}$$

$$x = 12$$

$$m\widehat{SLT} = 16x - 2$$

$$= 16(12) - 2$$

$$= 192 - 2$$

$$= 190^\circ$$