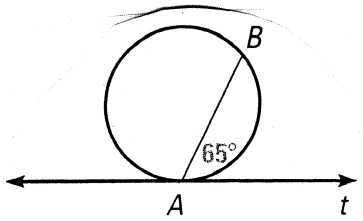
Geometry, Ch 10-5 Exer., pg 675 #3-13, 16-18

Given: Line t is tangent to the circle. Find indicated meas.

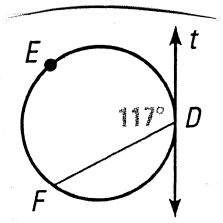
3. $m\widehat{AB}$



$2(65°) = m\widehat{AB}$

$130° = m\widehat{AB}$

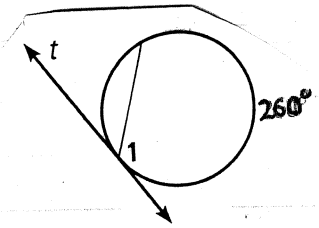
4. $m\widehat{DEF}$



$2(117°) = m\widehat{DEF}$

$234° = m\widehat{DEF}$

5. $m\angle 1$



$2(m\angle 1) = 260°$

$m\angle 1 = 130°$

6. The diagram is not drawn to scale. If $\overline{AB}$ is any chord that is not a diameter and line m is tangent to the circle at A, Which statement must be true?

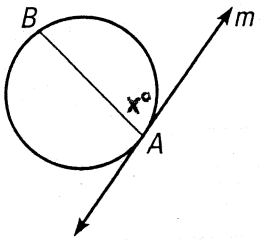
A. $x \leq 90$

B. $x \geq 90$

C. $x = 90$

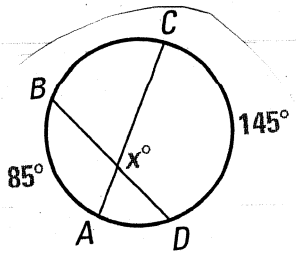
D. $x \neq 90$

If $\overline{AB}$ were a diameter then x would equal 90°. The only choice that rules out 90° is D, $x \neq 90$



Find the value of x.

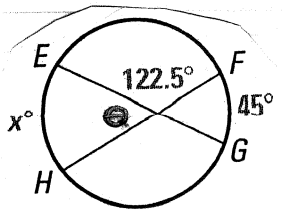
7.



$$x = \frac{85+145}{2} = \frac{230}{2}$$

$$\boxed{x = 115}$$

8.



$$\theta + 122.5 = 180$$

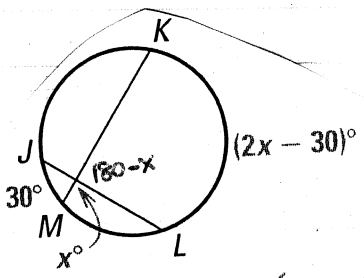
$$\theta = 57.5$$

$$57.5 = \frac{x+45}{2}$$

$$115 = x + 45$$

$$\boxed{70 = x}$$

9.



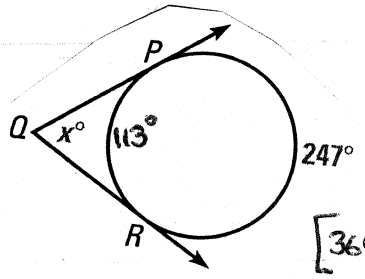
$$180 - x = \frac{30 + (2x - 30)}{2}$$

$$360 - 2x = 2x$$

$$360 = 4x$$

$$\boxed{90 = x}$$

10.

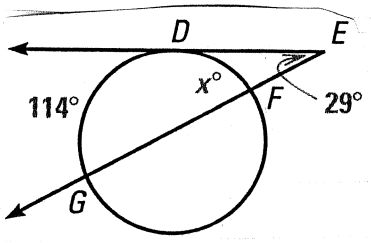


$$[360 - 247 = 113]$$

$$x = \frac{247-113}{2} = \frac{134}{2}$$

$$\boxed{x = 67}$$

11.



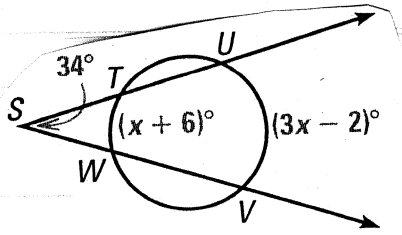
$$29 = \frac{114 - x}{2}$$

$$58 = 114 - x$$

$$-56 = -x$$

$$\boxed{56 = x}$$

12.



$$34 = \frac{(3x-2)-(x+6)}{2}$$

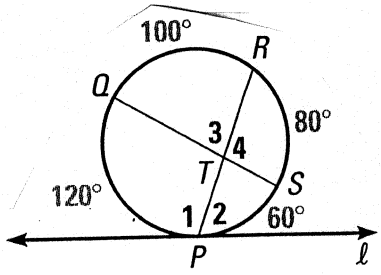
$$68 = 3x - 2 - x - 6$$

$$68 = 2x - 8$$

$$76 = 2x$$

$$\boxed{38 = x}$$

13. ★ **MULTIPLE CHOICE** In the diagram, ℓ is tangent to the circle at P. Which relationship is not true?



Ⓐ $m\angle 1 = 110°$ Ⓑ $m\angle 2 = 70°$

Ⓒ $m\angle 3 = 80°$ Ⓓ $m\angle 4 = 90°$ NO

$m\angle 1 = \frac{120+100}{2} = \frac{220}{2}$

$m\angle 1 = 110$

$m\angle 2 = \frac{80+60}{2} = \frac{140}{2}$

$m\angle 2 = 70$

$m\angle 3 = \frac{100+60}{2} = \frac{160}{2}$

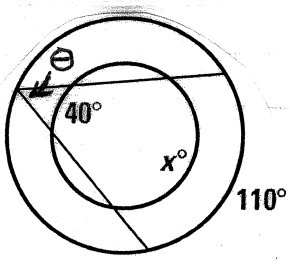
$m\angle 3 = 80$

$m\angle 4 = \frac{120+80}{2} = \frac{200}{2}$

$m\angle 4 = 100$

16. The circles below are concentric.

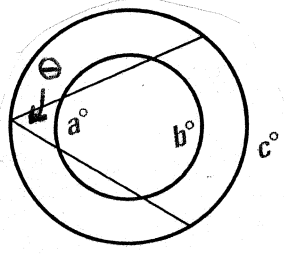
A. Find the value of x.



Outer circle
$2\theta = 110$
$\theta = 55$

Inner Circle
$55 = \frac{x-40}{2}$
$110 = x - 40$
$\boxed{150 = x}$

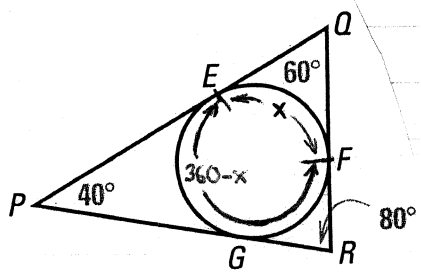
B. Express c in terms of a and b.



Inner Circle
$\theta = \frac{b-a}{2}$

Outer Circle
$2\theta = c$
$2\left(\frac{b-a}{2}\right) = c$
$\boxed{b-a = c}$

17. INSCRIBED CIRCLE In the diagram, the circle is inscribed in $\triangle PQR$. Find $m\widehat{EF}$, $m\widehat{FG}$, and $m\widehat{GE}$.



$m\widehat{EF}$:

$$60 = \frac{(360-x)-(x)}{2}$$
$$120 = 360-2x$$
$$-240 = -2x$$
$$\boxed{120 = x}$$

Use a similar method for $m\widehat{FG}$ and $m\widehat{GE}$.

$m\widehat{FG}$:

$$80 = \frac{(360-x)-(x)}{2}$$
$$160 = 360-2x$$
$$-200 = -2x$$
$$\boxed{100 = x}$$

$m\widehat{GE}$:

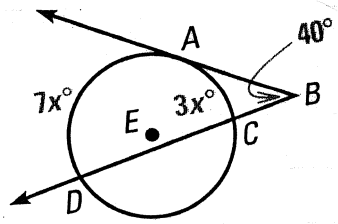
$$40 = \frac{(360-x)-(x)}{2}$$
$$80 = 360-2x$$
$$-280 = -2x$$
$$\boxed{140 = x}$$

NOTE: $\widehat{EF} + \widehat{FG} + \widehat{GE} = 360$

$120 + 100 + 140 = 360$

$360 = 360$ ✓

18. ALGEBRA: $\overrightarrow{BA}$ is tangent to circle E. Find $m\widehat{CD}$.



$$40 = \frac{7x-3x}{2} = \frac{4x}{2}$$
$$80 = 4x$$
$$20 = x$$

$m\widehat{DA} = 7(20) = 140°$

$m\widehat{AC} = 3(20) = 60°$

$m\widehat{DA} + m\widehat{AC} + m\widehat{CD} = 360$

$140° + 60° + m\widehat{CD} = 360$

$200° + m\widehat{CD} = 360$

$m\widehat{CD} = 160$