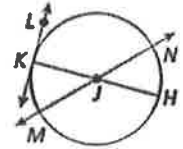


Advanced Geometry Chapter 10 Review – Circles

Name: Key

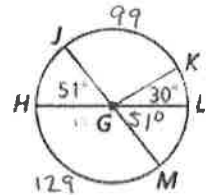
1. Use the figure to name each of the following:

- a. Tangent \overleftrightarrow{LK}
- b. Secant \overleftrightarrow{MN}
- c. Chord \overline{KH}



2. G is the center of the circle. Find each of the following and determine if it represents a major arc, minor arc, or semicircle:

- a. $m\widehat{KM}$ - minor arc - 81°
- b. $m\widehat{HMK}$ - major arc - 210°
- c. $m\widehat{JK}$ - minor arc - 99°
- d. $m\widehat{MJK}$ - major arc - 279°
- e. $m\widehat{HML}$ - Semicircle - 180°



3. Find the value of r.

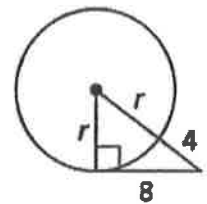
$$r^2 + 8^2 = (r+4)^2$$

$$r^2 + 64 = r^2 + 8r + 16$$

$$(r+4)(r+4)$$

$$r^2 + 4r + 4r + 16$$

$$r^2 + 8r + 16$$



$$64 = 8r + 16$$

$$48 = 8r$$

$$r = 6$$

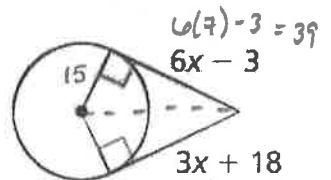
4. Using the figure to the right:

a. Solve for x.

$$6x - 3 = 3x + 18$$

$$-3x + 3 \quad -3x + 3$$

$$\frac{3x}{3} = \frac{21}{3} \quad x = 7$$



b. If the radius of the circle is 15 units, what is the distance from the center of the circle to the external point where the two tangents meet?

$$15^2 + 39^2 = c^2$$

$$225 + 1521 = c^2$$

$$\sqrt{1746} = \sqrt{c^2}$$

$$41.8 = c$$

5. Find the length of chord ST. Then, find the area of Triangle SQT.

$$7^2 + x^2 = 11^2$$

$$49 + x^2 = 121$$

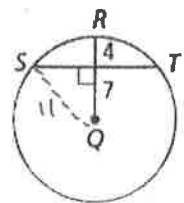
$$\sqrt{x^2} = \sqrt{72}$$

$$x = 8.5$$

$$ST = 2(8.5) = 17$$

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(17)(7) = 59.5 \text{ units}^2$$



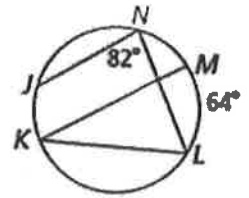
6. Find each of the following:

a. $m\widehat{JL}$

a) $82(2) = 164$

b. $m\angle MKL$

b) $\frac{1}{2}(64) = 32$



7. Solve for x.

AC is diameter so

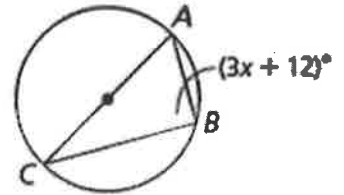
$$3x + 12 = \frac{1}{2}(180)$$

$$3x + 12 = 90$$

$$\begin{array}{r} 3x + 12 = 90 \\ -12 \quad -12 \\ \hline 3x = 78 \end{array}$$

$$3x = 78$$

$$x = 26$$



8. Find $m\angle RSP$.

$$5y - 21 = 3y + 3$$

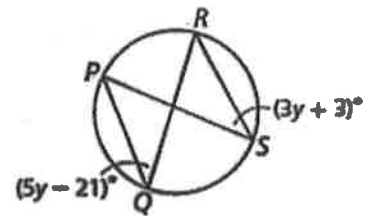
$$\begin{array}{r} 5y - 21 = 3y + 3 \\ -3y \quad -3y \\ \hline 2y - 21 = 3 \end{array}$$

$$\begin{array}{r} 2y - 21 = 3 \\ +21 \quad +21 \\ \hline 2y = 24 \end{array}$$

$$\frac{2y}{2} = \frac{24}{2} \quad y = 12$$

$$3(12) + 3 = 39$$

$$m\angle RSP = 39^\circ$$



9. Find each of the following:

a. $m\widehat{MR}$

a) $2(41) = 82^\circ$

b. $m\angle QMR$

b) $120 + 82 = 202$
 $360 - 202 = 158$
 $m\angle QMR = \frac{1}{2}(158)$

$$m\angle QMR = 79^\circ$$

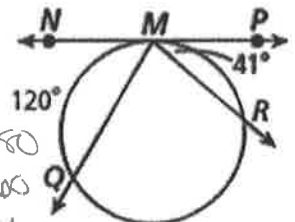
OR

$$m\angle NMP = 180$$

$$m\angle NMQ = 60$$

$$60 + 41 = 101$$

$$180 - 101 = 79^\circ$$



10. The quadrilateral is inscribed in the circle. Find $m\angle Q$.

$$5x + 20 + 7x - 8 = 180$$

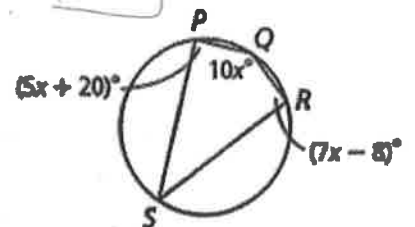
$$\begin{array}{r} 12x + 12 = 180 \\ -12 \quad -12 \\ \hline 12x = 168 \end{array}$$

$$12x = 168$$

$$x = 14$$

$$10(14) = 140$$

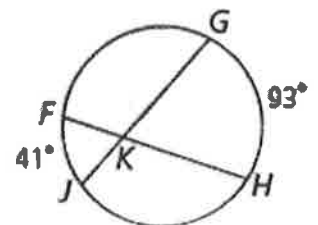
$$m\angle Q = 140$$



11. Find $m\angle GKH$.

$$m\angle GKH = \frac{1}{2}(93 + 41)$$

$$= 67^\circ$$

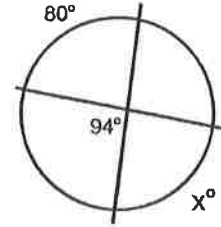


12. Solve for x.

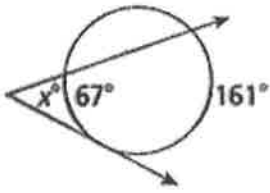
$$\begin{aligned}
 180 - 94 &= 86 \\
 86 &= \frac{1}{2}(80 + x) \\
 86 &= 40 + \frac{1}{2}x \\
 -40 \quad -40 \\
 \hline
 46 &= \frac{1}{2}x
 \end{aligned}$$

$$\frac{46}{\frac{1}{2}} = \frac{\frac{1}{2}x}{\frac{1}{2}}$$

$$x = 92$$

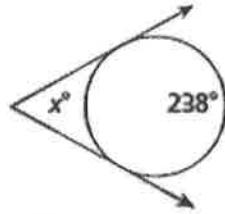


13. Find the value of x for each figure below.



$$\begin{aligned}
 x &= \frac{1}{2}(161 - 67) \\
 &= \frac{1}{2}(94)
 \end{aligned}$$

$$x = 47$$

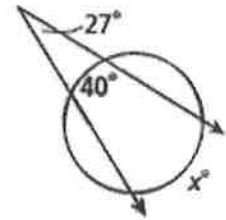


$$360 - 238 = 122$$

$$x = \frac{1}{2}(238 - 122)$$

$$= \frac{1}{2}(116)$$

$$x = 58$$



$$27 = \frac{1}{2}(x - 40)$$

$$27 = \frac{1}{2}x - 20$$

$$+20 \quad +20$$

$$\frac{47}{\frac{1}{2}} = \frac{\frac{1}{2}x}{\frac{1}{2}}$$

$$x = 94$$

14. Use the figure to the right to find each measure:

a. $m\widehat{DF}$

$$a) 50 = \frac{1}{2}(150 - x)$$

$$50 = 75 - \frac{1}{2}x$$

$$\begin{aligned}
 -75 \quad -75 \\
 \hline
 -25 &= -\frac{1}{2}x \\
 -\frac{-1}{2} \quad -\frac{-1}{2} \\
 \hline
 x &= 50
 \end{aligned}$$

$$m\widehat{DF} = 50$$

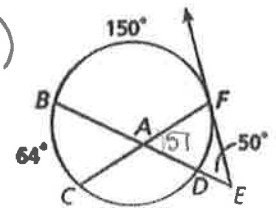
b. $m\widehat{CD}$

$$m\widehat{CD} =$$

$$b) 360 - (150 + 50 + 64)$$

$$360 - 264$$

$$m\widehat{CD} = 96^\circ$$



15. Solve for y and find the length of chord BC.

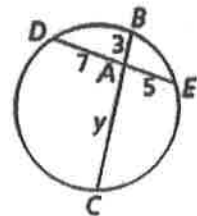
$$3y = 5(7)$$

$$\frac{3y}{3} = \frac{35}{3}$$

$$y = 11.67$$

$$BC = 3 + 11.67$$

$$BC = 14.67$$



16. Solve for y.

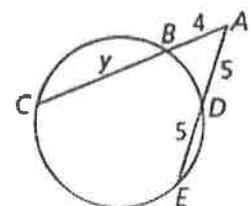
$$4(4 + y) = 5(5 + 5)$$

$$16 + 4y = 50$$

$$-16 \quad -16$$

$$\frac{4y}{4} = \frac{34}{4}$$

$$y = 8.5$$

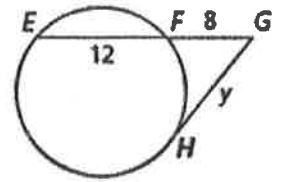


17. Solve for y.

$$y^2 = 8(20)$$

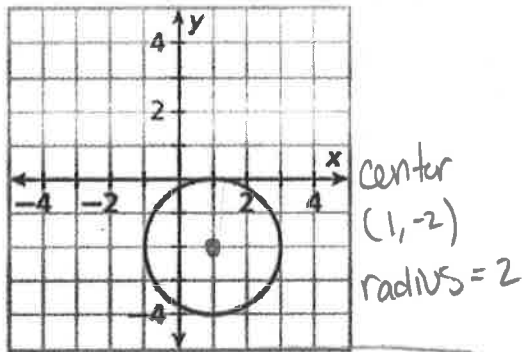
$$\sqrt{y^2} = \sqrt{160}$$

$$y = 12.6$$

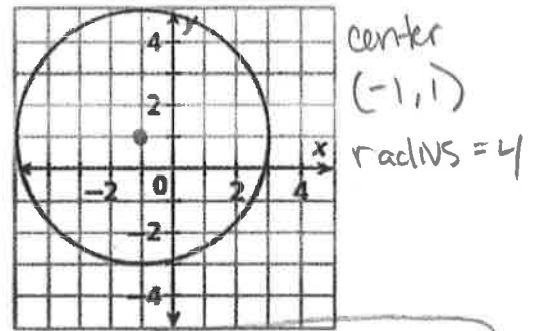


18. Write the equation for the circle in each graph below:

$$(x-h)^2 + (y-k)^2 = r^2$$



$$(x-1)^2 + (y+2)^2 = 4$$



$$(x+1)^2 + (y-1)^2 = 16$$

19. Write the equation of a circle that:

a. Passes through (2, 2) and has a center at (1, 1).

$$(x-h)^2 + (y-k)^2 = r^2$$

$$(2-1)^2 + (2-1)^2 = r^2$$

$$(1)^2 + (1)^2 = r^2$$

$$2 = r^2$$

$$(x-1)^2 + (y-1)^2 = 2$$

b. Passes through (-5, 1) and has a center at (1, -2).

$$(x-h)^2 + (y-k)^2 = r^2$$

$$(-5-1)^2 + (1+2)^2 = r^2$$

$$(-6)^2 + (3)^2 = r^2$$

$$36 + 9 = r^2$$

$$45 = r^2$$

$$(x-1)^2 + (y+2)^2 = 45$$

20. Write the equation for each circle from the given equation below. Identify the radius and the center.

a. $x^2 + y^2 - 20x - 4y + 30 = 0$

$$x^2 - 20x + \underline{\quad} + y^2 - 4y + \underline{\quad} = -30$$

$$x^2 - 20x + 100 + y^2 - 4y + 4 = -30 + 100 + 4$$

$$(x-10)^2 + (y-2)^2 = 74$$

center (10, 2) radius = $\sqrt{74}$

b. $x^2 + y^2 - 6x - 28y + 185 = 0$

$$x^2 - 6x + \underline{9} + y^2 - 28y + \underline{196} = -185 + \underline{9} + \underline{196}$$

$$(x-3)^2 + (y-14)^2 = 20$$

center (3, 14) radius = $\sqrt{20}$