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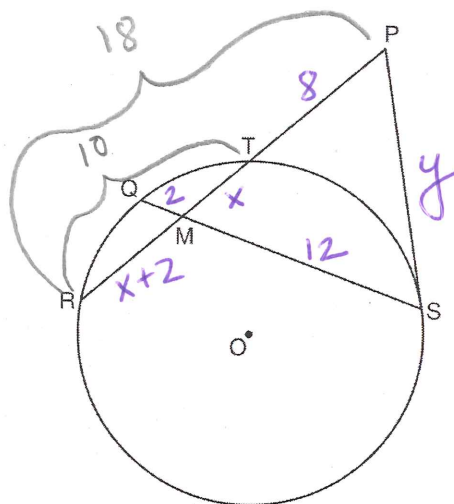
Unit 6 – Review

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Geometry Period: \_\_\_\_\_

Date: \_\_\_\_\_

- 1) In the diagram below of circle  $O$ , chords  $\overline{RT}$  and  $\overline{QS}$  intersect at  $M$ . Secant  $\overline{PTR}$  and tangent  $\overline{PS}$  are drawn to circle  $O$ . The length of  $\overline{RM}$  is two more than the length of  $\overline{TM}$ ,  $QM = 2$ ,  $SM = 12$ , and  $PT = 8$ .



- a) Find the length of  $\overline{RT}$ .

$$x(x+2) = 2 \cdot 12$$

$$x^2 + 2x = 24$$

$$x^2 + 2x - 24 = 0$$

$$(x+6)(x-4) = 0$$

$$x+6=0 \quad x-4=0$$

$$\cancel{x=-6} \quad x=4$$

$$RT = x + 2 + x$$

$$RT = 4 + 2 + 4$$

$$\boxed{RT = 10}$$

- b) Find the length of  $\overline{PS}$ .

$$RP \cdot TP = PS^2$$

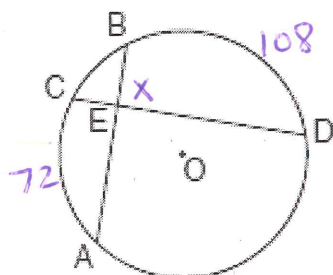
$$18 \cdot 8 = y^2$$

$$144 = y^2$$

$$12 = y$$

$$\boxed{PS = 12}$$

- 2) In the accompanying diagram of circle  $O$ , chords  $\overline{AB}$  and  $\overline{CD}$  intersect at  $E$  and  $m\widehat{AC} : m\widehat{CB} : m\widehat{BD} : m\widehat{DA} = 4 : 2 : 6 : 8$ . What is  $m\angle DEB$ ?



$$4x + 2x + 6x + 8x = 360$$

$$20x = 360$$

$$x = 18$$

$$\widehat{BD} = 6x = 6(18) = 108$$

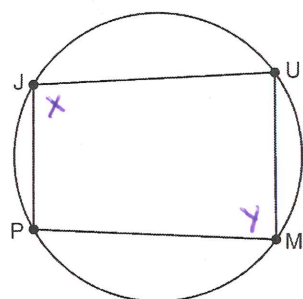
$$\widehat{CA} = 4x = 4(18) = 72$$

$$\frac{72 + 108}{2} = m\angle DEB$$

$$\frac{180}{2} = m\angle DEB$$

$$\boxed{90 = m\angle DEB}$$

- 3) In the diagram below, quadrilateral  $JUMP$  is inscribed in a circle. Opposite angles  $J$  and  $M$  must be



1) right

2) complementary

3) congruent

4) supplementary

$$\angle m = \frac{1}{2}(a) = \frac{1}{2}a$$

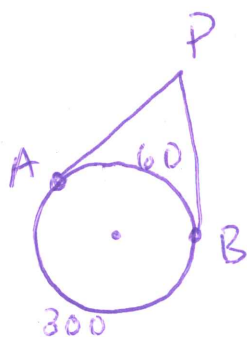
$$\angle J = \frac{1}{2}(360 - a) = 180 - \frac{1}{2}a$$

$$\angle J + \angle M = \frac{1}{2}a + 180 - \frac{1}{2}a = 180$$

$$\widehat{JU} = a$$

$$\widehat{PMU} = 360 - a$$

- 4) In circle  $O$ ,  $\overline{PA}$  and  $\overline{PB}$  are tangent to the circle from point  $P$ . If the ratio of the measure of major arc  $AB$  to the measure of minor arc  $AB$  is  $5:1$ , determine  $m\angle P$ .



$$5x + x = 360$$

$$6x = 360$$

$$x = 60$$

$$\frac{300 - 60}{2} = \angle P$$

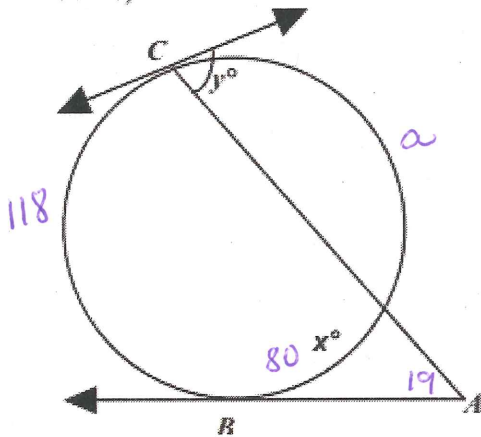
$$\frac{240}{2} = \angle P$$

$$\boxed{120 = \angle P}$$

$$\text{major arc } AB = 5x = 5(60) = 300$$

$$\text{minor arc } AB = x = 60$$

- 5) Find the measure of each variable if  
 $m\angle A = 19$  and  $m\widehat{BC} = 118$ . (not drawn to scale)



$$\frac{118 - x}{2} = 19$$

$$118 - x = 38$$

$$-x = -80$$

$$\boxed{x = 80}$$

$$360 - (118 + 80) = a$$

$$360 - 198 = a$$

$$162 = a$$

$$y = \frac{1}{2}(162)$$

$$\boxed{y = 81}$$

- 6) Write an equation of the circle whose diameter  $\overline{AB}$  has endpoints  $A(-4, 2)$  and  $B(4, -4)$ .

$$\text{Midpoint} = \text{center} = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) = \left( \frac{-4 + 4}{2}, \frac{2 + -4}{2} \right)$$

$$= \left( \frac{0}{2}, \frac{-2}{2} \right)$$

$$= (0, -1) = (h, k)$$

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

$$(-4 - 0)^2 + (2 - -1)^2 = r^2$$

$$(-4)^2 + (3)^2 = r^2$$

$$16 + 9 = r^2$$

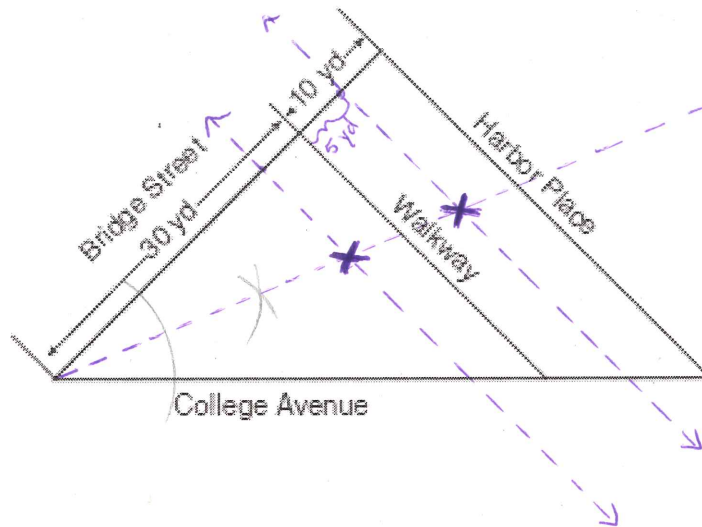
$$25 = r^2$$

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

$$(x - 0)^2 + (y - -1)^2 = 25$$

$$\boxed{x^2 + (y + 1)^2 = 25}$$

7) A triangular park is formed by the intersection of three streets, Bridge Street, Harbor Place, and College Avenue, as shown in the accompanying diagram. A walkway parallel to Harbor Place goes through the park. A time capsule has been buried in the park in a location that is equidistant from Bridge Street and College Avenue and 5 yards from the walkway. Indicate on the diagram with an X each possible location where the time capsule could be buried.



8) Given:

Circle O

Diameter AB

Secants  $\overline{AC}$  and  $\overline{FC}$

$\overline{OG}$  is the perpendicular bisector of  $\overline{DF}$

the measure of arc AF is  $110^\circ$

$m\angle C = 30^\circ$

$AO = 10$

$AC = 36$

$$30 = \frac{110 - m\widehat{BD}}{2}$$

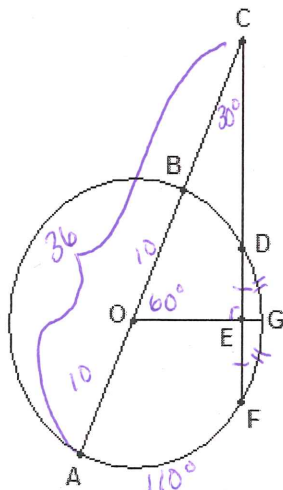
$$60 = 110 - m\widehat{BD}$$

$$-50 = -m\widehat{BD}$$

$$\boxed{50 = m\widehat{BD}}$$

Find: the measure of arc BD

The length of CE



$$\angle COD + 30 + 90 = 180$$

$$\angle COD + 120 = 180$$

$$\angle COD = 60$$



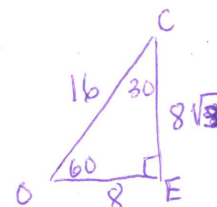
$\therefore \triangle COE$  is a 30-60-90 special right  $\triangle$ .

$$AO + OB + BC = 36$$

$$10 + 10 + BC = 36$$

$$20 + BC = 36$$

$$BC = 16$$



$$\boxed{CE = 8\sqrt{3}}$$