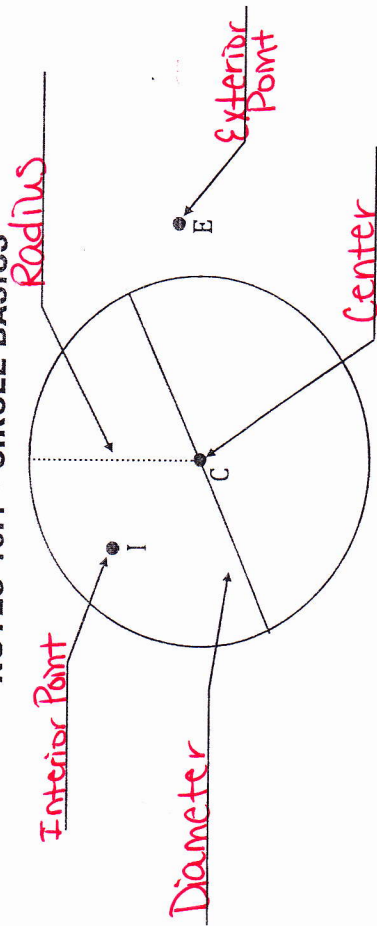
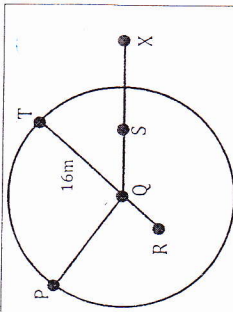


NOTES 10.1 - CIRCLE BASICS



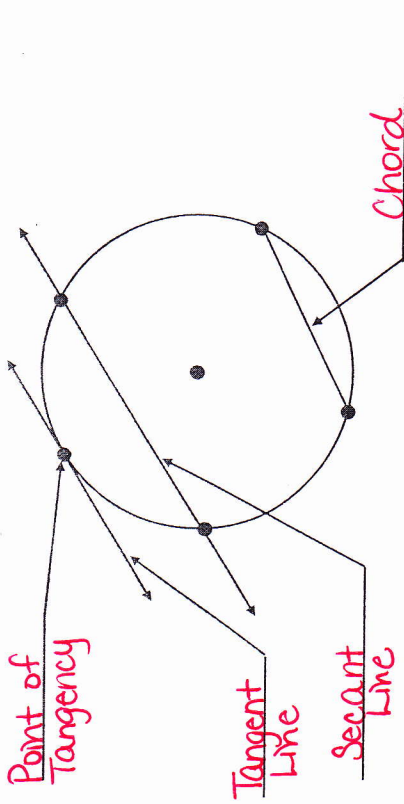
EXAMPLE 1: Q is the center of this circle.



- a) Name the circle: Circle Q or QQ
- b) Name all radii shown: QP, QT
- c) What is the length of any radius of this circle? 16m
- d) What would be the length of any diameter of this circle? 32m
- e) Name all of the interior points shown: R, Q, S
- f) Name all of the exterior points shown: X

EXAMPLE 2: Calculate the radius or diameter as indicated.

- a)  $r = 27 \text{ in.}$   $d =$  54 in      b)  $d = 12x$   $r =$  6x
- c)  $d = 18.6 \text{ cm}$   $r =$  9.3 cm



EXAMPLE 3: Name each of the following.

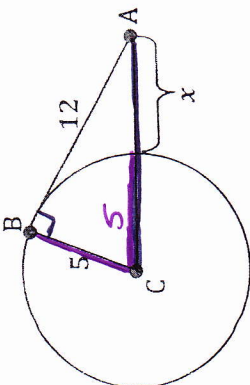
- a) Center: O
- b) All Radii: ON, OR, OM
- c) All Chords: MT
- d) All Secants: ST
- e) Diameter: MN
- f) Tangent: PS
- g) Point of Tangency: Q

EXAMPLE 4: Name the following.

- a) Tangent: TX
- b) Point of tangency: T
- c) Point in the interior: I or P
- d) Point in the exterior: X

**THEOREM:** If a line is tangent to a circle, then it is PERPENDICULAR to the radius drawn to the point of tangency.

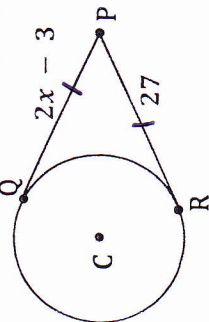
**EXAMPLE 5:** Refer to  $\odot C$  with tangent  $\overline{AB}$ . Find 'x'.



Find AC.  
 $leg^2 + leg^2 = hyp^2$   
 $5^2 + 12^2 = AC^2$   
 $169 = AC^2$   
 $13 = AC$   
 $x = 13 - 5$   
 $x = 8$

**THEOREM:** If two segments from the same EXTERIOR point are tangent to a circle, then they are congruent.

**EXAMPLE 6:** Find the value of 'x'.

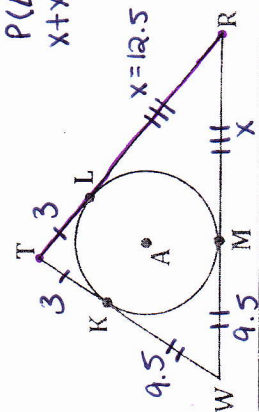


$2x - 3 = 27$   
 $2x = 30$   
 $x = 15$

When circles are inscribed in polygons, the polygons are said to be **CIRCUMSCRIBED** polygons.

In such polygons, each side is TANGENT to the circle.

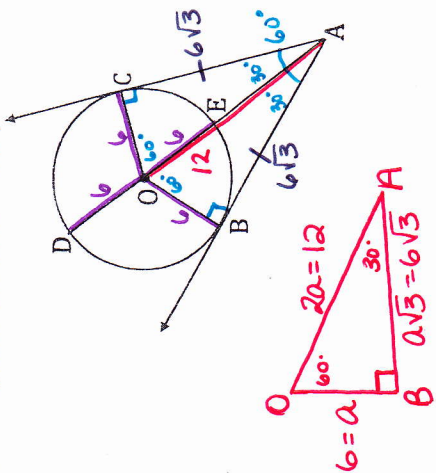
**EXAMPLE 7:**  $\triangle TRW$  is circumscribed about  $\odot A$ . If the perimeter of  $\triangle TRW$  is 50,  $TK = 3$ , and  $WM = 9.5$ , find TR.



$P(\triangle TRW) = 50$   
 $x + x + 3 + 3 + 9.5 + 9.5 = 50$   
 $2x + 25 = 50$   
 $2x = 25$   
 $x = 12.5$   
 $TR = 12.5 + 3$   
 $TR = 15.5$

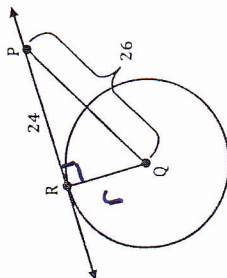
**EXAMPLE 8:** Given that  $OA = 12$ ,  $OB = 6$ , and  $m\angle BAC = 60^\circ$ , find the following.

- a)  $OC = 6$
- b)  $ED = 12$
- c)  $AB = 6\sqrt{3}$
- d)  $AC = 6\sqrt{3}$
- e)  $m\angle BAO = 30^\circ$
- f)  $m\angle OCA = 90^\circ$
- g)  $m\angle AOC = 60^\circ$
- h)  $m\angle EOC = 60^\circ$
- i)  $EA = 6$



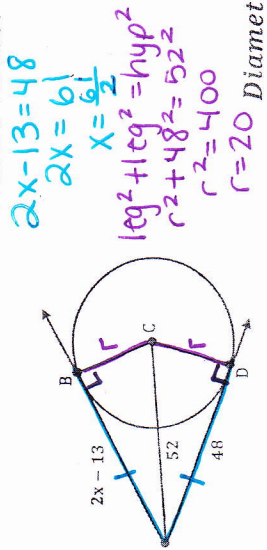
**EXAMPLE 9:** In the figure below,  $\overline{RP}$  is tangent to circle Q at R. Find the radius of circle Q.

$leg^2 + leg^2 = hyp^2$   
 $r^2 + 24^2 = 26^2$   
 $r^2 = 100$



$r = 10$

**EXAMPLE 10:** Find the indicated values.



$2x - 13 = 48$   
 $2x = 61$   
 $x = \frac{61}{2}$   
 $leg^2 + leg^2 = hyp^2$   
 $r^2 + 48^2 = 52^2$   
 $r^2 = 400$   
 $r = 20$   
 Diameter of circle C = 40