

**Circle** - all points in a plane that are a given distance, called the **radius**, from a given point called the **center**.

**Diameter** - a line segment or **chord** that passes through the center and has ends on the circle.

**Equation of a Circle with center (h,k) and radius r is**  $(x-h)^2 + (y-k)^2 = r^2$

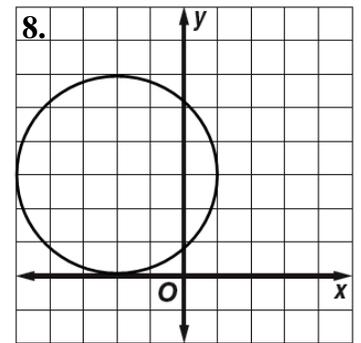
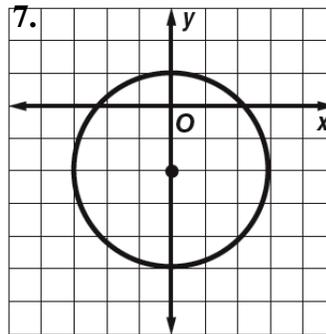
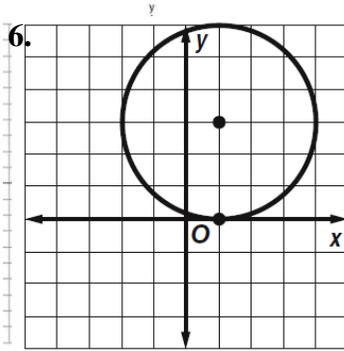
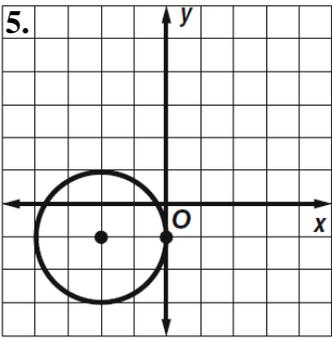
**A. write the center point and the radius for each circle.**

1.  $x^2 + y^2 = 9$     2.  $(x-3)^2 + (y-1)^2 = 16$     3.  $(x+2)^2 + (y-4)^2 = 4$     4.  $(x+4)^2 + (y-3)^2 = 25$

5.  $x^2 + (y-3)^2 = 49$     6.  $(x-7)^2 + y^2 = 36$     7.  $x^2 + y^2 = 12$     8.  $(x+12)^2 + (y+4)^2 = 18$

**B. Write the equation of the circle**

1. Center at origin, radius of 7    2. Center (-2, 5), radius of 6    3. Center (0, 4), radius 1    4. Center (-7, 0) radius of 10



**C. Find the center and radius of each circle.**

1.  $x^2 + 4x + 4 + y^2 - 8y + 16 = 0$

2.  $x^2 + y^2 + 6x - 4y - 3 = 0$

3.  $x^2 - 12x + 84 = 16y - y^2$

4.  $x^2 + y^2 + 10x - 12y = 11$

5.  $x^2 + y^2 - 8x - 12y + 4 = 0$

6.  $x^2 - 14x + 25 = 8y - y^2$

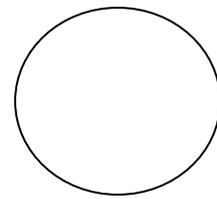
**D. Draw and clearly label each on the circle**

**Chord** - a segment whose endpoints lie on a circle

**Secant** - is a line that intersects a circle at two points

**Tangent** - a line that intersects a circle at exactly 1 pt

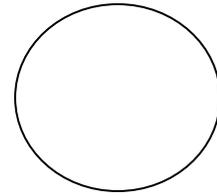
**Point of tangency** - the point where the tangent and a circle intersect



**Illustrate the theorem on the circle to the right.**

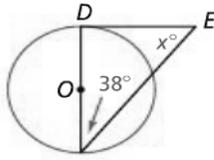
**Theorem** If a line is tangent to a circle, then the line is perpendicular to the radius at the point of tangency.

If a line is perpendicular to the radius at a point on the circle  
Then the line is tangent to the circle.

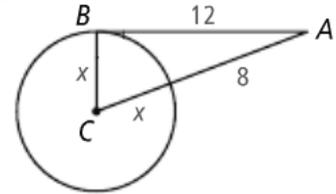


**E. Assume the lines that appear tangent, are tangent. Find x to the nearest tenth**

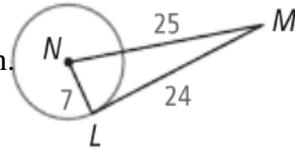
1. If DE is a tangent line,  
What is the angle x?



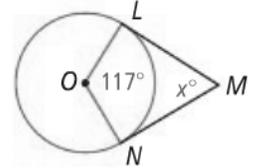
2. If AB is tangent to circle C,  
Find the radius.



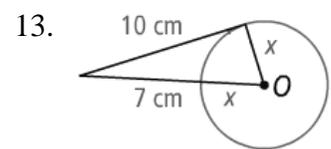
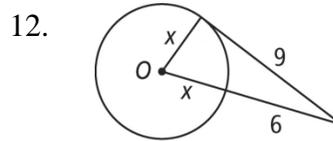
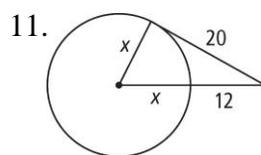
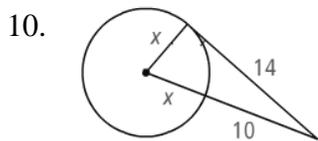
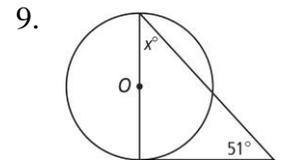
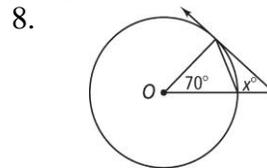
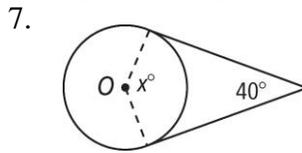
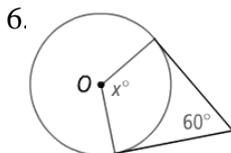
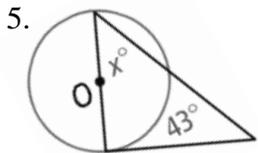
3. Is ML tangent to  
Circle N at L? Explain.



4. LM and MN are both tangents  
to circle O, Find  $x^\circ$ . Hint:  
Sum of internal angles of a  
quadrilateral is  $360^\circ$



**F. Find the variable, assume the lines that appear tangent are tangent. Round to the nearest tenth.**



**G. Determine whether a tangent is show in the diagram**

