

**Circle:** the set of all points in a plane that are equidistant from a given point, called the center

**Radius:** distance from the center to a point on the circle  
label:  $\odot P$  "circle P"

**Congruent Circles:**  
have the same radius

**Diameter:** a segment whose endpoints are on the circle and it goes through the center

**Chord:** a segment whose endpoints are on the circle

Diameter vs Chord

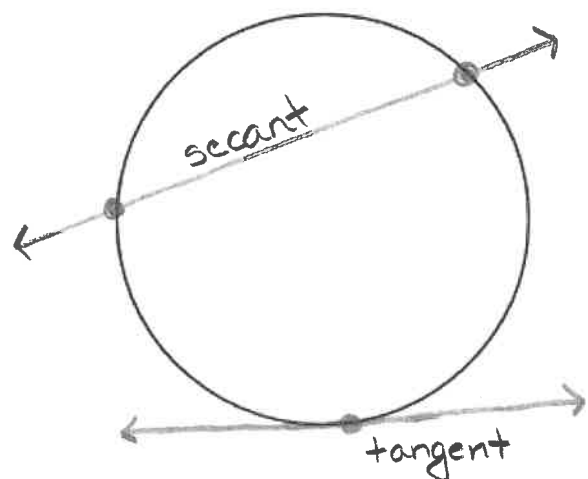
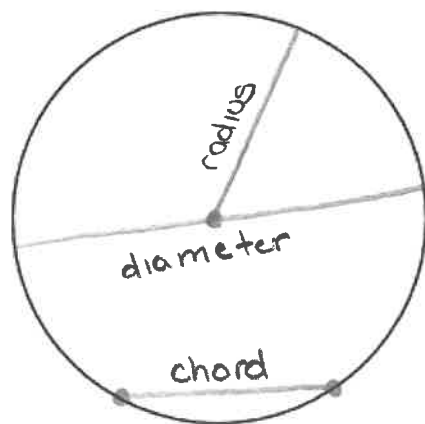
Diameter must go through the center whereas a chord doesn't

**Secant:** a line that intersects a circle in 2 points

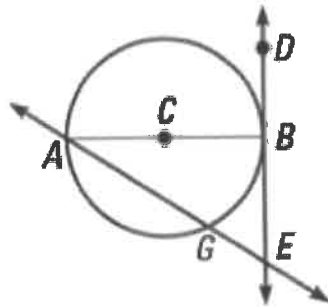
**Tangent:** a line in the plane of a circle that intersects the circle in exactly 1 point

Secant vs Tangent

secant  $\rightarrow$  2 points  
tangent  $\rightarrow$  1 point



1. Identify special segments:



secant  
← AG →

tangent  
← DE →

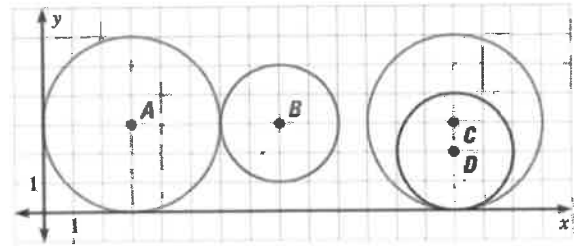
radius  
 $\overline{CB}$   
 $\overline{CA}$

diameter  
 $\overline{AB}$

chord  
 $\overline{AG}$   
 $\overline{AB}$

2. Use the diagram to find the given lengths:

- Radius of  $\odot A$
- Diameter of  $\odot A$
- Center of  $\odot B$



a)  $r = 3$

b)  $d = 6$

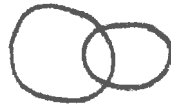
c)  $(8, 3)$

**Coplanar Circles:**

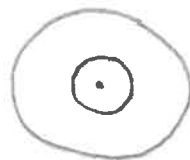
- Tangent Circles** : intersect in 1 point



- 2 points of Intersection**



- Concentric Circles** have common center and do not intersect



\* if do not have common center  
then are not concentric



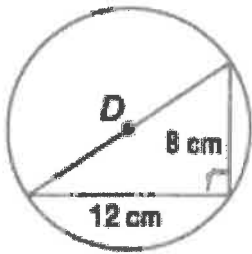
Circumference:

$$C = 2\pi r \quad \text{or} \quad C = \pi d$$

Area of a Circle:

$$A = \pi r^2$$

3. The right triangle shown is inscribed in  $\odot D$ . Find the exact circumference of  $\odot D$ .



$$d^2 = 8^2 + 12^2$$

$$d^2 = 64 + 144$$

$$d^2 = 208$$

$$d = \sqrt{208}$$

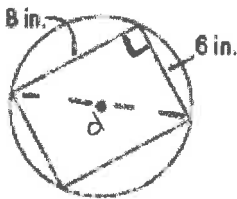
$$C = \pi \sqrt{208}$$

$$= \pi \sqrt{16 \cdot 13}$$

$$= 4\pi \sqrt{13}$$

4. Find the exact circumference of each circle by using the given inscribed or circumscribed polygon.

a.



$$d^2 = 8^2 + 6^2$$

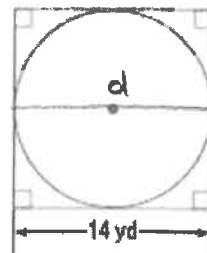
$$d^2 = 64 + 36$$

$$d^2 = 100$$

$$d = 10$$

$$C = 10\pi$$

b.



$$d = 14$$

$$C = 14\pi$$

