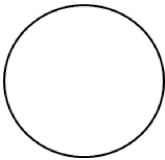
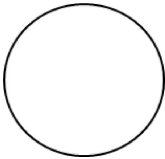
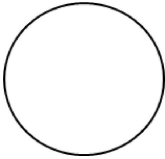
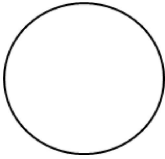
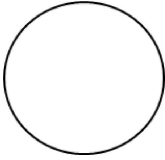
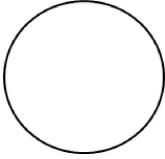
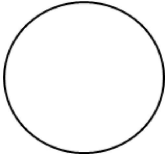
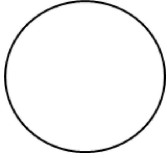
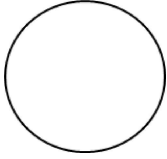
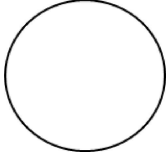
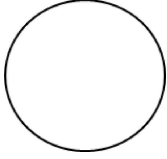
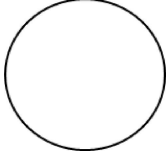
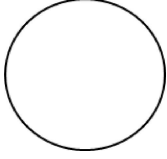


Unit 9 Lesson 1: Intro to Circles

Circle Dictionary

Terms	Definition	Example/ Visual
Circle	The set of points equidistant from a given point (the center).	
Radius*	A segment with endpoints at the center and on the circle.	
Chord*	A segment with endpoints on the circle.	
Diameter*	A chord that passes through the center. (Diameter = 2 times radius)	
Secant*	A line that intersects the circle in two places.	
Tangent*	A line that intersects the circle at exactly one place.	
Point of Tangency	The point at which the tangent line intersects the circle.	

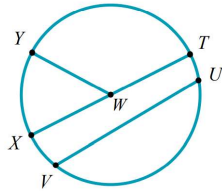
Central Angle*	An angle with a vertex at the center, and two sides that are radii.	
Inscribed Angle*	An angle with a vertex in the circle, and two sides that are chords.	
Arc*	A portion of the edge of the circle defined by two endpoints.	
Minor Arc	An arc with a measure less than 180 degrees. *use two letters to name it*	
Major Arc	An arc with a measure greater than 180 degrees. *use three letters to name it*	
Semicircle	An arc with endpoints on the diameter. *always equal to 180 degrees*	

Formulas			
Area	Circumference	Arc Length	Sector Area

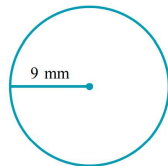
Lesson 1 Example Problems

1. A circle with the center W is shown in the figure below.

- Name a radius
- Name a diameter
- Name a chord
- If the length of WY is 3 units, what is the length of TX ?

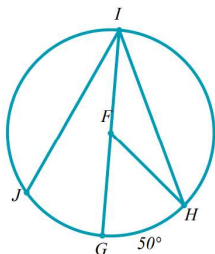


2. Find the circumference and area of a circle with a radius 9mm. Keep answer in terms of π .



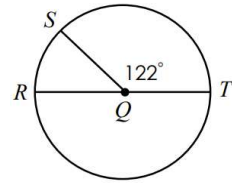
3. In the circle below, F is the center, GJ is the diameter, and $m\widehat{GH} = 50^\circ$. Find the following information.

- An inscribed angle
- Major arc
- Minor arc
- Find $m\angle GFH$
- Find $m\widehat{GJI}$



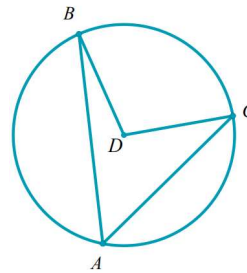
3. Find each angle and arc measures.

$$\begin{aligned} m\widehat{ST} &= \underline{\hspace{2cm}} \\ m\widehat{RS} &= \underline{\hspace{2cm}} \\ m\angle SRT &= \underline{\hspace{2cm}} \end{aligned}$$



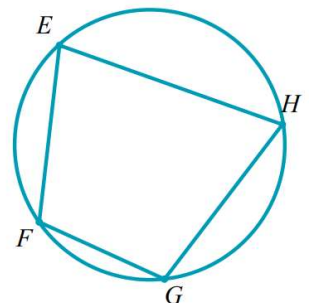
4. The circle below has a center D . Suppose that $m\angle BDC = 104^\circ$ is the central angle. Find the following.

- $m\widehat{BC}$
- $m\angle BAC$

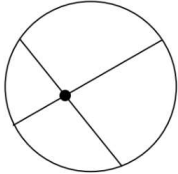
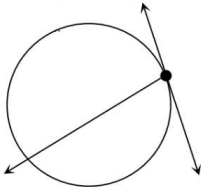
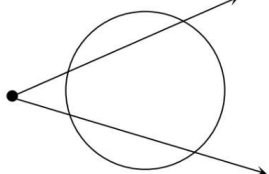
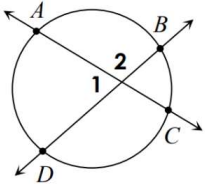
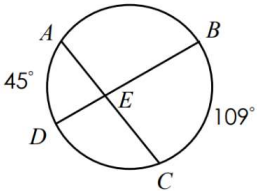
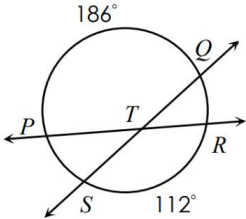
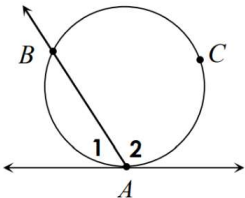
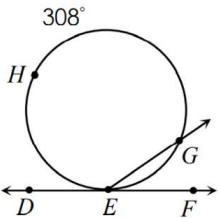
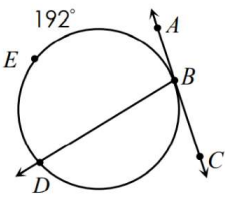


5. In the circle below, $m\widehat{GHE} = 216^\circ$ and $m\angle HGF = 103^\circ$. Find the following.

- $m\angle GHE = \underline{\hspace{2cm}}^\circ$
- $m\angle HEF = \underline{\hspace{2cm}}^\circ$



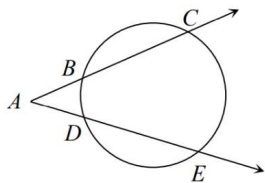
Unit 9 Lesson 2: Angles with Circles

<p>ARCS & ANGLES</p> <p><i>formed by Intersecting Chords, Secants, & Tangents</i></p>	<p>When chords, secants, and tangents intersect in a circle (Figure 1), on a circle (Figure 2), or outside of a circle (Figure 3), special relationships exist between the angle and arc measures formed.</p>		
<p>Figure 1 (inside the circle)</p> 	<p>Figure 2 (on the circle)</p> 	<p>Figure 3 (outside the circle)</p> 	
<p>INTERIOR <i>Intersections</i></p>	<p>If two secants or chords intersect inside a circle, then the measure of the angle formed is equal to half the sum of the measures of the intercepted arcs.</p>		
	<p>$m\angle 1 =$ _____</p> <p>$m\angle 2 =$ _____</p>		
<p>Find each measure.</p>			
<p>1. $m\angle AED$</p> 	<p>2. $m\angle STR$</p> 		
<p>ON THE CIRCLE <i>Intersections</i></p>	<p>If a secant and a tangent intersect at the point of tangency, then the measure of each angle formed is equal to half the measure of its intercepted arc.</p>		
	<p>$m\angle 1 =$ _____</p> <p>$m\angle 2 =$ _____</p>		
<p>Find each measure.</p>			
<p>7. $m\angle DEG$</p> 	<p>8. $m\angle DBC$</p> 		

EXTERIOR Intersections

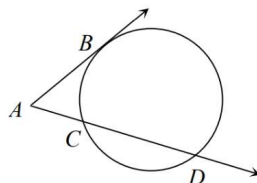
If secants and/or tangents intersect on the exterior of a circle, then the measure of the angle formed is equal to **half the difference of the intercepted arcs**.

TWO SECANTS



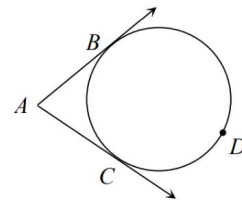
$$m\angle A =$$

SECANT & TANGENT



$$m\angle A =$$

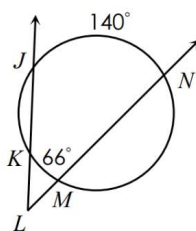
TWO TANGENTS



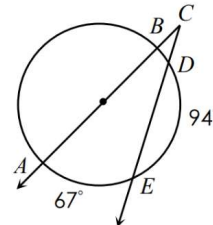
$$m\angle A =$$

Find each measure.

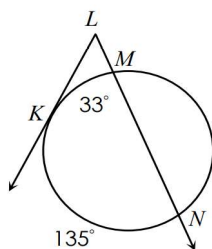
11. $m\angle KLM$



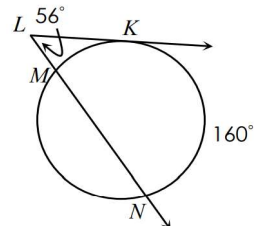
12. $m\angle BCD$



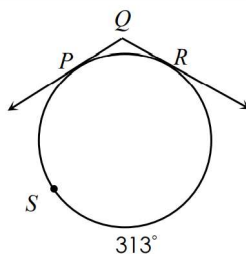
15. $m\angle KLM$



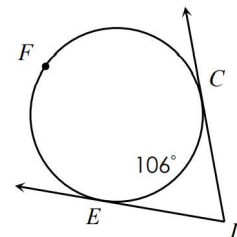
18. $m\widehat{MK}$



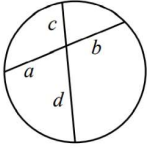
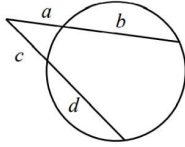
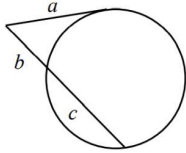
19. $m\angle PQR$



20. $m\angle CDE$

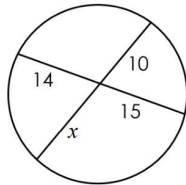


Unit 9 Lesson 3: Segments with Angles

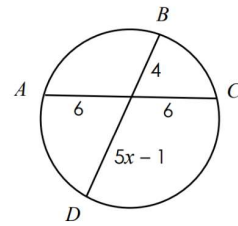
<p style="text-align: center;">SEGMENT LENGTHS Formed by Intersecting Chords, Secants, & Tangents</p>	TYPE 1	TYPE 2	TYPE 3
	<p style="text-align: center;">Intersecting chords (or secants) inside the circle.</p> 	<p style="text-align: center;">Intersecting secants outside the circle.</p> 	<p style="text-align: center;">Intersecting secant and tangent outside the circle.</p> 

Find each value or measure. Assume all segments that appear to be tangent are tangent.

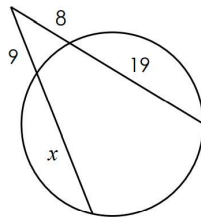
1. Solve for x .



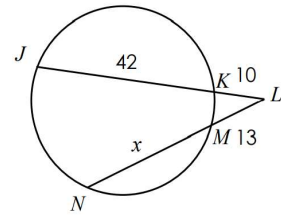
2. Find BD .



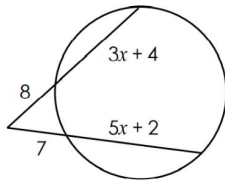
5. Solve for x .



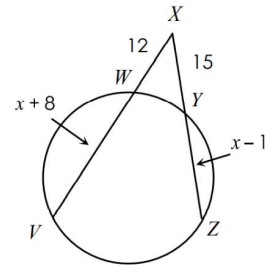
6. Find NL .



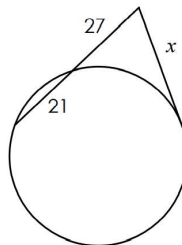
7. Solve for x .



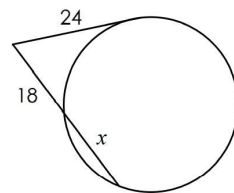
8. Find YZ .



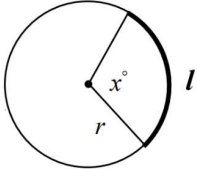
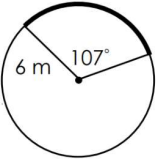
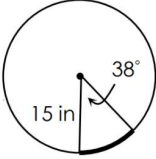
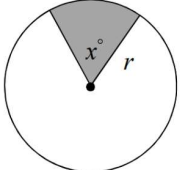
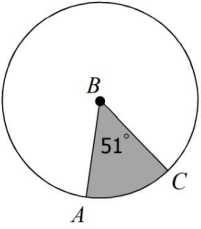
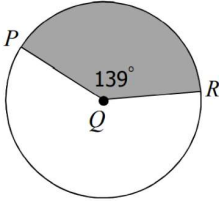
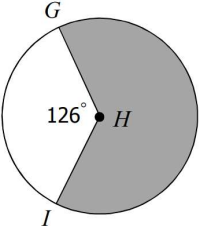
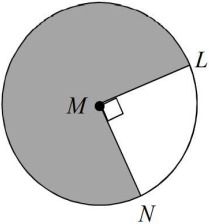
11. Solve for x .



9. Solve for x .



Unit 9 Lesson 4: Arc Length, Sector Area, and Equation of a circle

<h2>ARC LENGTH</h2> 	<p>The length of an arc is a portion of the circumference.</p>		
	<p>Arc Length Formula: </p>	<p>x = degree measure of arc C = circumference</p>	
	<p>Directions: Find the length of each bolded arc to the nearest hundredth.</p>		
	<p>1.</p> 	<p>2.</p> 	
<h2>SECTOR</h2>		<p>A sector is a _____ of a circle bounded by a _____ and its intercepted _____.</p> <p>Think of a sector like a slice of _____!</p>	
<h2>AREA OF A SECTOR</h2> <p><i>Formula</i></p>	<p>The area of a sector of a circle is a portion of the entire area.</p>		
	<div style="border: 1px solid black; width: 200px; height: 60px; margin: 0 auto;"></div>	<p>x = degree measure of arc r = radius of circle</p>	
<p>Directions: Find the area of each shaded sector. Round to the nearest hundredth.</p>			
<p>1. $BC = 16$ ft</p> 	<p>2. $PQ = 22$ cm</p> 		
<p>4. $GH = 13$ yd</p> 	<p>8. $MN = 29.5$ mi</p> 		

Standard form of the equation of a circle is

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

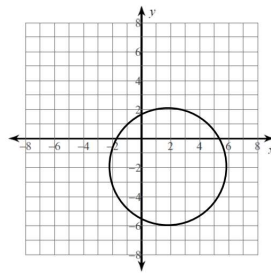
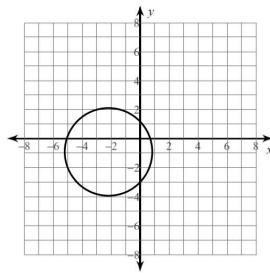
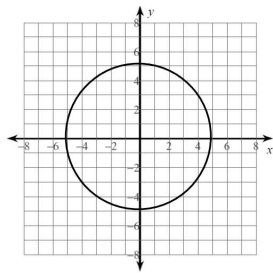
Where the center of the circle is C (____,____) and the radius is ____.

Use the equations below to fill in the blanks. Leave answers in simplest radical form.

	Center	Radius
1. $x^2 + y^2 = 1$	_____	_____
2. $x^2 + y^2 = 9$	_____	_____
3. $x^2 + y^2 = 25$	_____	_____
4. $(x-3)^2 + (y-2)^2 = 16$	_____	_____
5. $(x+3)^2 + (y-2)^2 = 16$	_____	_____
6. $(x+3)^2 + (y+2)^2 = 9$	_____	_____
7. $(x-3)^2 + (y+2)^2 = 25$	_____	_____
8. $(x+1)^2 + (y-3)^2 = 4$	_____	_____
9. $x^2 + (y+8)^2 = 80$	_____	_____

Write an equation for each circle 13-15:

13. _____ 14. _____ 15. _____



Find the radius and center, then graph the circle 16-18:

16. $x^2 + y^2 = 4$

17. $(x-4)^2 + (y-3)^2 = 4$

18. $(x+3)^2 + (y-2)^2 = 9$

