Name_____

Honors Geometry **Ch 10 Notes Packet**

Sec 10.1:

After this section you will have completed the following Common Core State Standard(s):

- **G.CO.1: Know precise definitions of angle, circle, perpendicular and parallel lines and line segments based on the undefined notions of point, line distance along a line/ around an arc, etc.**

And will be improving your skills in the following Mathematical Practice(s):

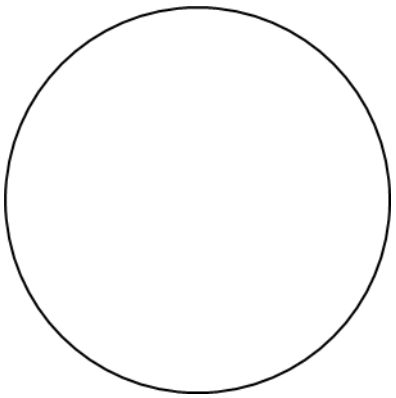
4. Model with mathematics

1. Make sense of problems and persevere in solving them

Specifically, you should be able to:

- **Identify and use parts of circles**
- **Solve problems involving the circumference of a circle**

A _____is the set of all points in a plane that are _____ from a given point, which is the_____.



Prior knowledge terms: radius, diameter

A _____ is any segment whose endpoints lie on a circle.

The _____ of a circle is the distance around the circle and has the equation:

_____ is the ratio between the _____ of any circle and its _____

A polygon is _____ in a circle if all of its vertices lie on the circle.

A circle is _____ about a polygon if it contains all the vertices of the polygon.

_____circles have the same center but different sized radii

Examples:

Sec 10.2:

After this section you will have completed the following Common Core State Standard(s):

- **G.C.2: Identify and describe relationship among inscribed angles, radii and chords**
- **G.C.5: Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius and define the radian the radian measure of an angle as the constant of proportionality. Derive the formula for the area of a sector**

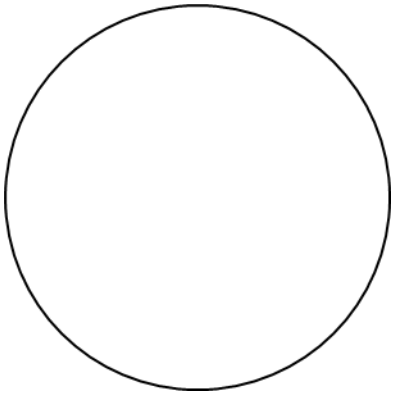
And will be improving your skills in the following Mathematical Practice(s):

4. Model with mathematics
6. Attend to precision

Specifically, you should be able to:

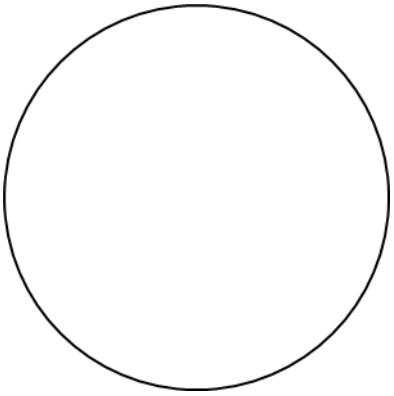
- **Identify central angles, major arcs, minor arcs, and semicircles and find their measures**
- **Find arc lengths**

A _____is an angle whose vertex is at the _____ of the circle.



The measure of a central angle is the same as the measure of its _____.

An _____ is an unbroken piece of a circle.



_____ arcs: less than 180^o
_____ arcs: greater than 180^o
_____: equals 180^o

Thm 10.1: Two arcs from the same or congruent circles are congruent if and only if their _____.

_____ are arcs in a circle that have exactly one point in common.

The <u>length</u> of an arc with a measure of M° is…

<u>Examples:</u>

Sec 10.3:

After this section you will have completed the following Common Core State Standard(s):

- **G.C.2: Identify and describe relationship among inscribed angles, radii and chords**
- **G.MG.3: Apply geometric methods to solve problems**

And will be improving your skills in the following Mathematical Practice(s):

4. Model with mathematics

3. Construct viable arguments and critique the reasoning of others

Specifically, you should be able to:

- **Recognize and use relationships between arcs, chords and diameters**

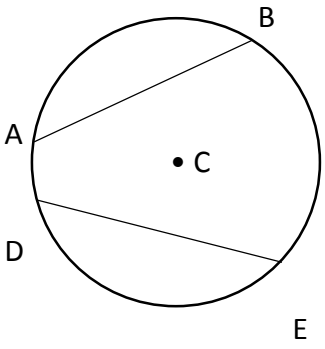
Recall: A _____ is a segment with endpoints on the circle.

Thm 10.2: In the same/ congruent circles, two minor arcs are_____ if and only if their corresponding _____ are _____.

Proof Statements Reasons

Given: $\overline{AB} \cong \overline{DE}$

Prove: $\widehat{AB} \cong \widehat{DE}$

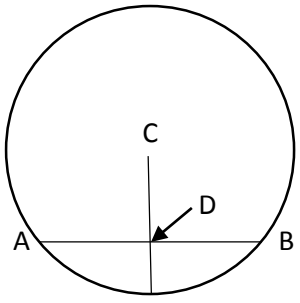


Thm 10.3: A radius or diameter is _____ to a chord if and only if it _____ the chord (and its arc).

Proof Statements Reasons

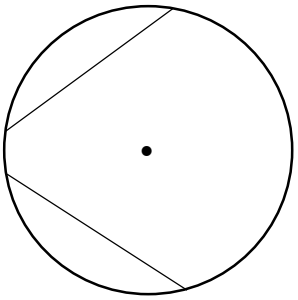
given: $\overline{CD} \perp \overline{AB}$

prove: $\overline{AD} \cong \overline{DB}$



Corollary/Thm 10.4: The _____ of a chord is a _____ of the circle.

Thm 10.5: Chords are congruent if and only if they are _____ from the center of the circle.



Examples:

Sec 10.4:

After this section you will have completed the following Common Core State Standard(s):

- **G.C.2: Identify and describe relationship among inscribed angles, radii and chords**
- **G.C.3: Construct and use the inscribed and circumscribed circles of a triangle and prove the properties of angles for a quadrilateral inscribed in a circle**

And will be improving your skills in the following Mathematical Practice(s):

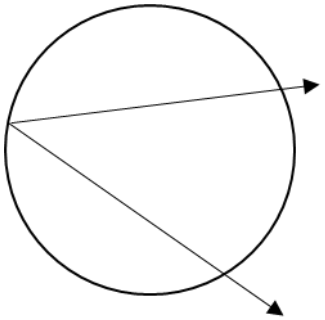
3. Construct viable arguments and critique the reasoning of others

7. Look for and make use of structure

Specifically, you should be able to:

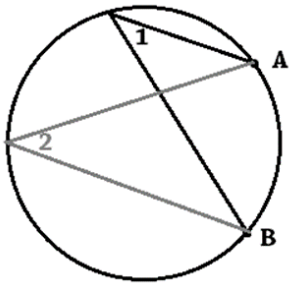
- **Find measures of inscribed angles**
- **Find measures of angles of inscribed polygons**

An _____ angle is an angle whose vertex is _____ the circle and whose sides are _____ of the circle.

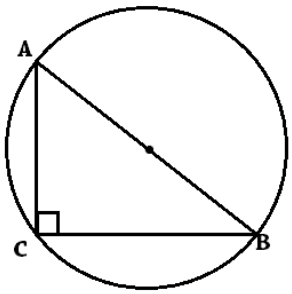


Thm 10.6: The measure of an inscribed angle is _____ the measure of its intercepted arc.

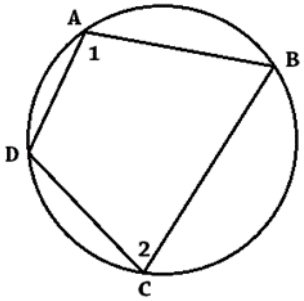
Thm 10.7: If two inscribed angles intercept the _____ or _____ arcs, then they are _____.



Thm 10.8: A right triangle is inscribed in a circle if and only if its hypotenuse is a _____ of the circle.



Thm 10.9: If a quadrilateral is inscribed in a circle, then its _____ angles are _____.



Statements	Reasons

Examples:

Sec 10.5:

After this section you will have completed the following Common Core State Standard(s):

- **G.C.4: Construct and use a tangent line from a point outside a given circle to the circle**

And will be improving your skills in the following Mathematical Practice(s):

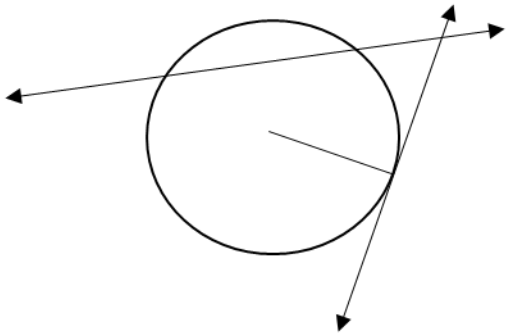
1. Make sense of problems and persevere in solving them

2. Reason abstractly and quantitatively

Specifically, you should be able to:

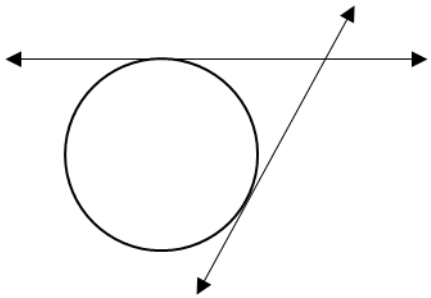
- **Use properties of tangents**
- **Solve problems involving circumscribed polygons**

A _____ is a line that intersects a circle at exactly _____ point called the _____.

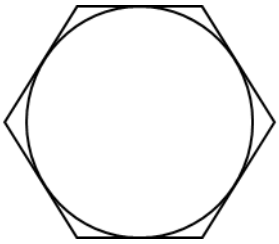


Thm 10.10: A line is tangent to a circle if and only if it is _____ to a _____ at the point of tangency.

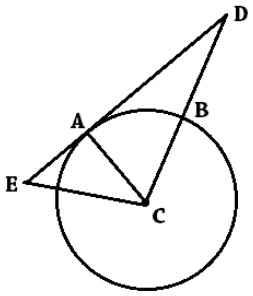
Thm 10.11: Two tangents from the same point are _____.



A polygon is _____ about a circle if every side of the polygon is _____ to the circle.



Examples:



If the radius of the circle is 5, AD=12, and BD=8, show that $\overleftrightarrow{ED}$ is tangent to the circle.

If AC=7, what is AE?

Sec 10.6:

After this section you will have completed the following Common Core State Standard(s):

- **G.C.4: Construct and use a tangent line from a point outside a given circle to the circle**

And will be improving your skills in the following Mathematical Practice(s):

1. Make sense of problems and persevere in solving them

3. Construct viable arguments and critique the reasoning of others

Specifically, you should be able to:

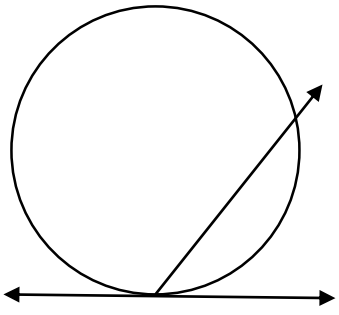
- **Find measures of angles formed by lines intersecting on, inside or outside a circle**
- **Solve problems using inscribed angles and angles formed by lines intersecting on, inside or outside a circle**

A _____ is a line that intersects a circle at exactly ____ points.

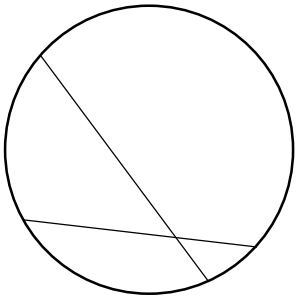
The measure of an angle is related to the measure of its intercepted arc(s) based on where the _____ of the angle is:

- Thm 10.12: (inside)
- Thm 10.13: (on)
- Thm 10.14: (outside)

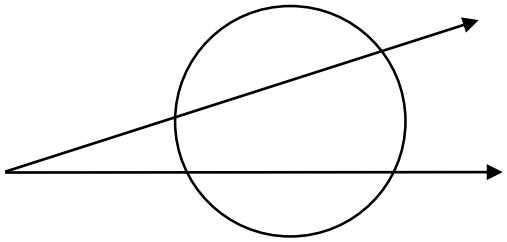
On the circle:

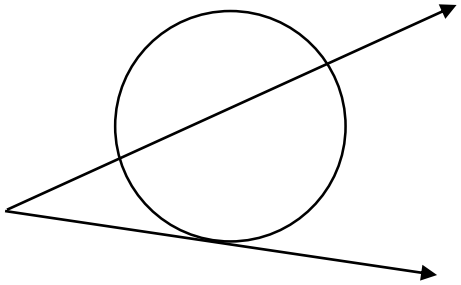


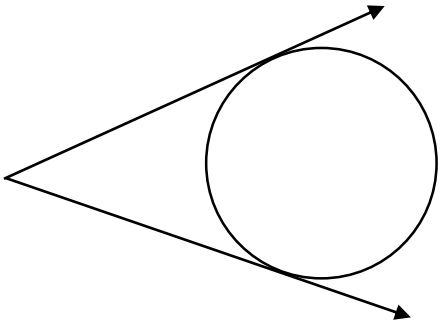
Inside the circle:



Outside the circle:

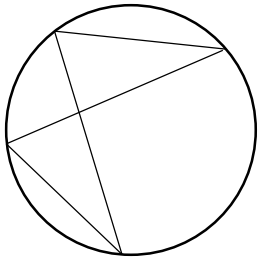






Arc-Intercept Corollary

If two inscribed angles intercept the same _____, then they are _____



Examples:

Sec 10.7:

After this section you will have completed the following Common Core State Standard(s):

- **G.C.4: Construct and use a tangent line from a point outside a given circle to the circle**

And will be improving your skills in the following Mathematical Practice(s):

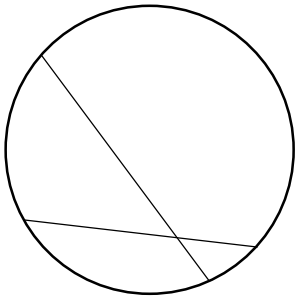
1. Make sense of problems and persevere in solving them

7. Look for and make use of structure

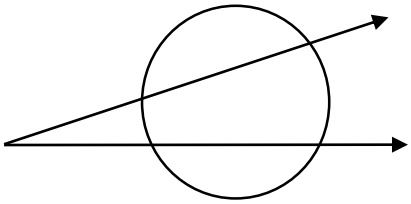
Specifically, you should be able to:

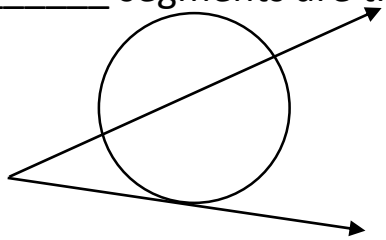
- **Find measures of segments formed by lines intersecting on, inside or outside a circle**
- **Solve problems segments formed by lines intersecting on, inside or outside a circle**

Thm 10.15: If two chords intersect _____ a circle, then the _____ of the parts of each chord are the same.

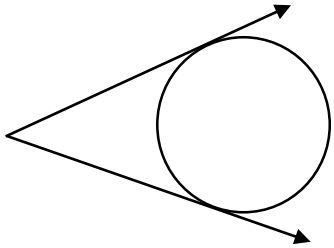


Thm 10.16: If two secants, or a secant and a tangent intersect _____ a circle, then the products of the _____ part of each segment and the _____ segments are the same.





Recall the relationship of 2 tangent segments intersecting outside the circle:



Sec 10.8:

After this section you will have completed the following Common Core State Standard(s):

- **G.GPE.1: Derive the equation of a circle given the center and the radius using Pythagorean Theorem. Complete the square to find the center and radius of a circle given by an equation**
- **G.GPE.6: Find the point on a directed line segment between 2 given points that partitions the segment by the given ratio**

And will be improving your skills in the following Mathematical Practice(s):

2. Reason abstractly and quantitatively

7. Look for and make use of structure

Specifically, you should be able to:

- **Write the equation for a circle**
- **Graph a circle on the coordinate plane**

The equation of a circle comes from the distance formula. If (x,y) is any point on the circle, (h, k) is the center and r is the distance between them, then

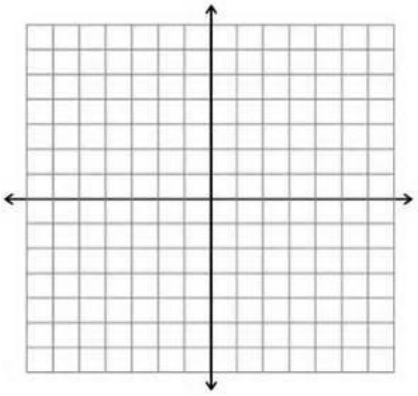
r =

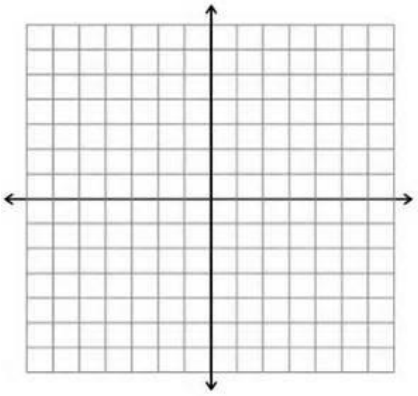
By squaring both sides of the equation, the equation of a circle with radius r and center (h, k) is:

If $(x-h)^2+(y-k)^2<r^2$, then (x,y) is _____ the circle.
If $(x-h)^2+(y-k)^2>r^2$, then (x,y) is _____ the circle.

Examples:

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





2. Find all of points that are 3 units from (1, 2) & equidistant from the x & y axis.