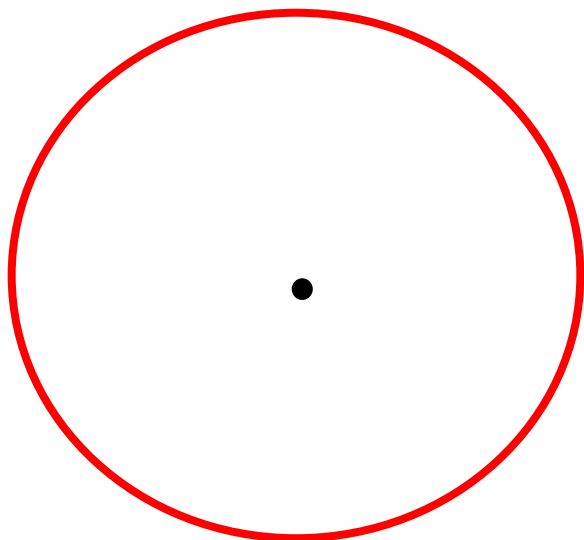


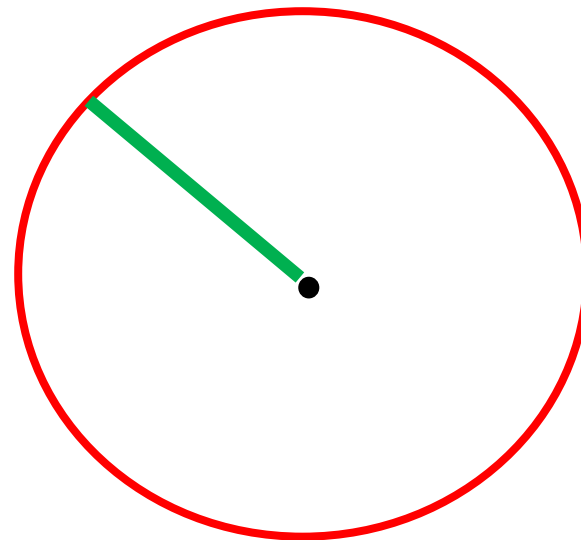
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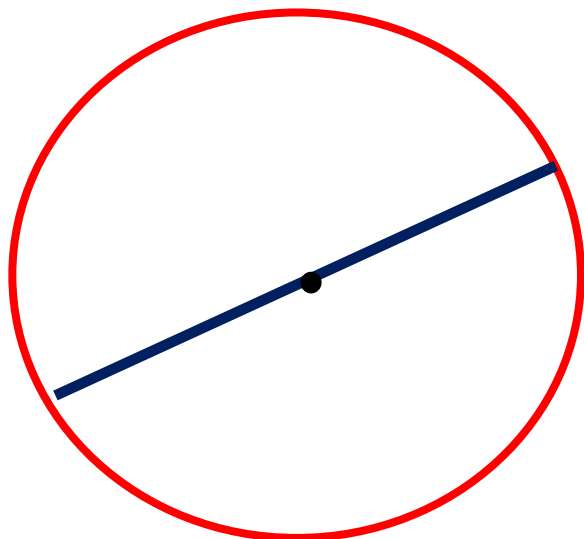
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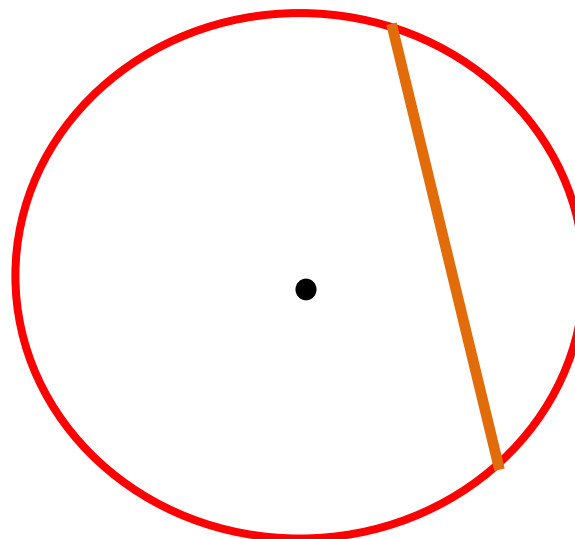
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**Radius**

- The distance *from the center* to a point on the circle.

**Circle**

- Set of points in a plane equidistant from a given point (*the center*) that lies in the same plane
- Named by the center

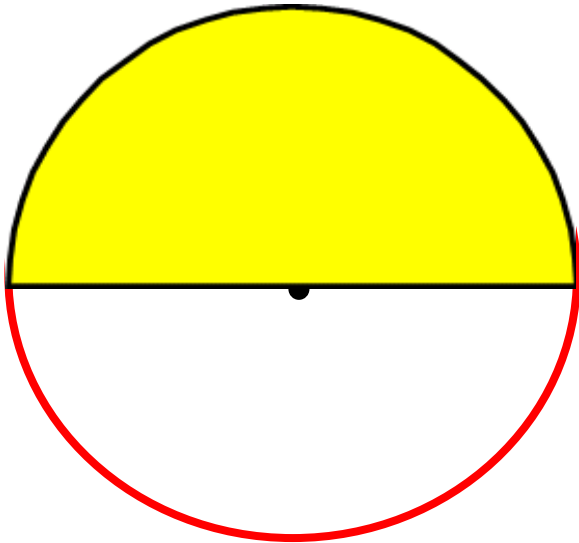
**Chord**

- Segment whose endpoints lie on the circle.

**Diameter**

- The distance from one point of the circle to another point on the circle *passing through the center*.

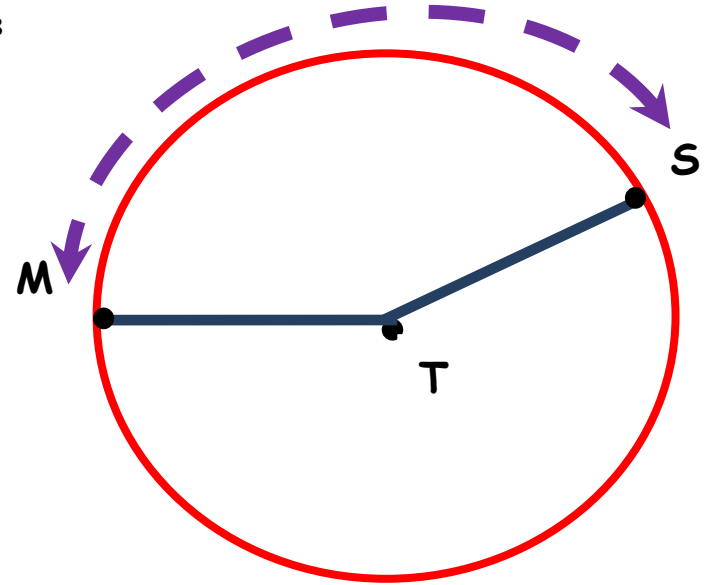
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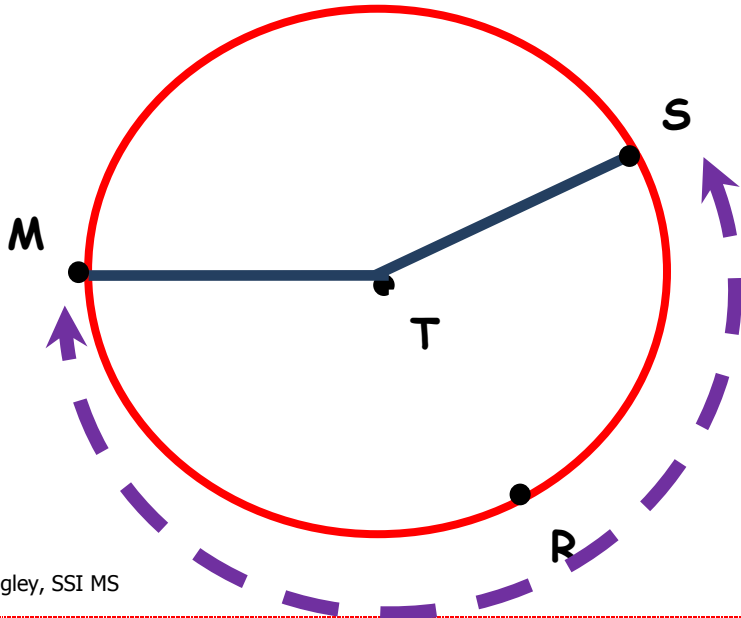
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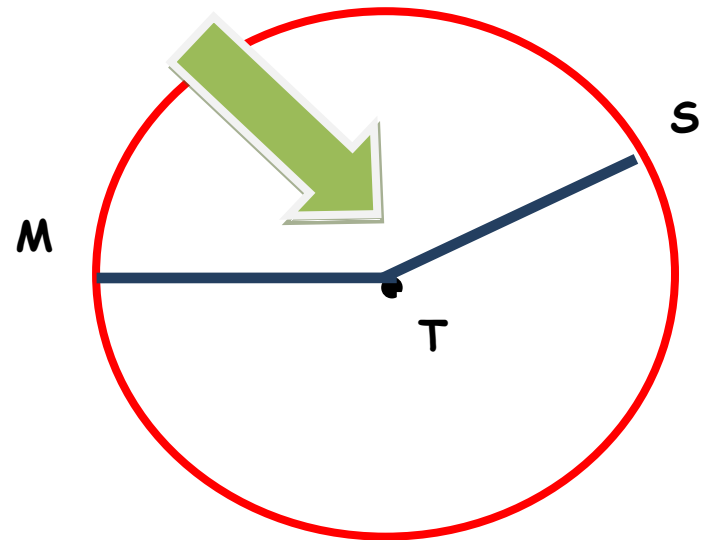
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## DEFINITION

**Minor Arc**

- An arc that is smaller than a semicircle
- Named by the radii endpoints
- Measured by the degrees of the central angle

## DEFINITION

**Semicircle**

- An arc whose endpoints are the endpoints of the diameter
- 180 degrees of the circle (**half** the circle)

## DEFINITION

**Central Angle**

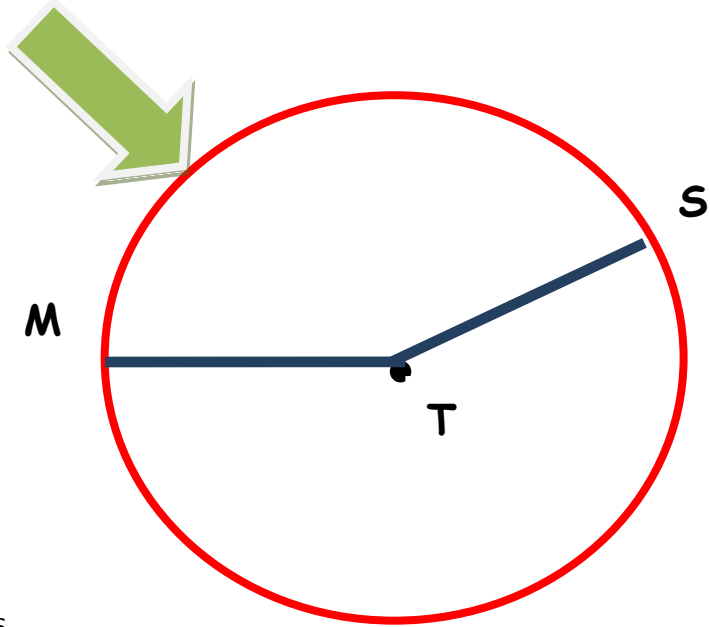
- An angle in the plane of the circle whose vertex is the center of the circle

## DEFINITION

**Major Arc**

- An arc that is bigger than a semicircle
- Named by the radii endpoints and one other point on the circle
- Measured by the degrees of the central angle

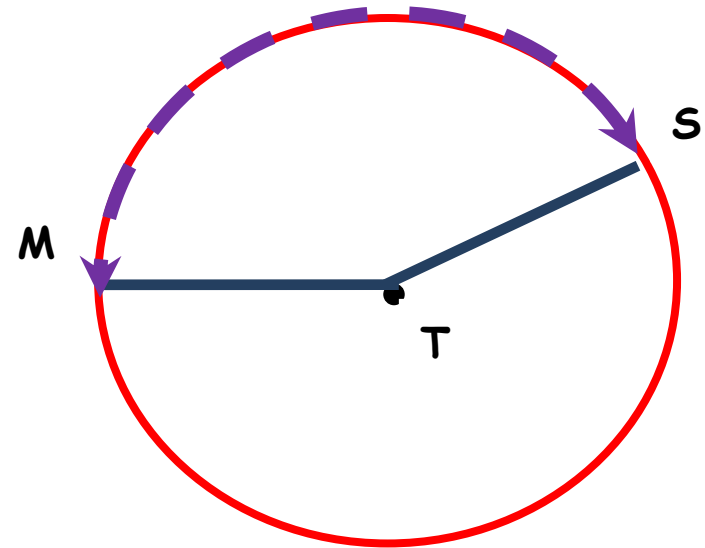
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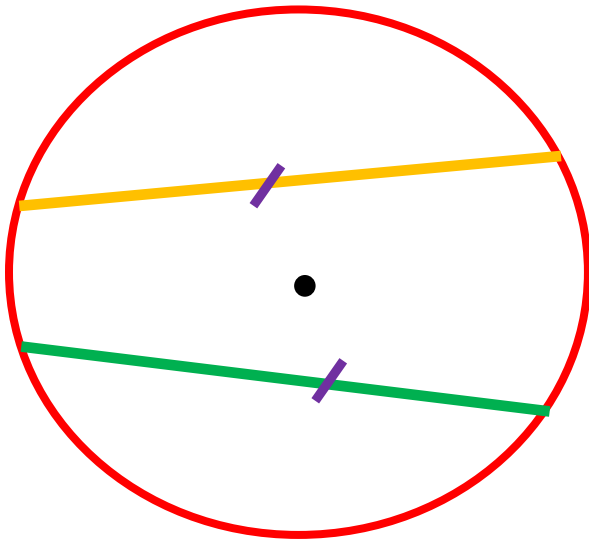
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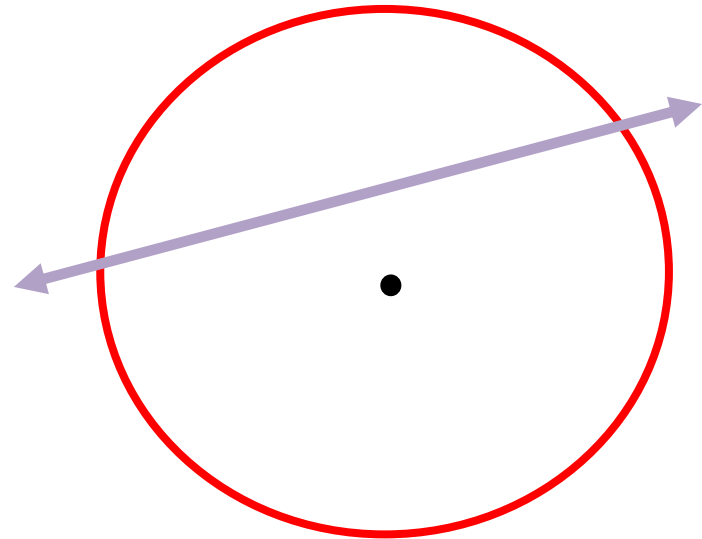
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**Arc Length**

- The length of the arc of a circle (a piece of the circumference)
- The degree measure of the central angle of the circle divided by 360 degrees times the circumference

$$L = (M/360)(2\pi r)$$

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**Intercepted Arc**

- An arc made by the endpoints of the central angle

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**Secant**

- A line that intersects the circle at two points

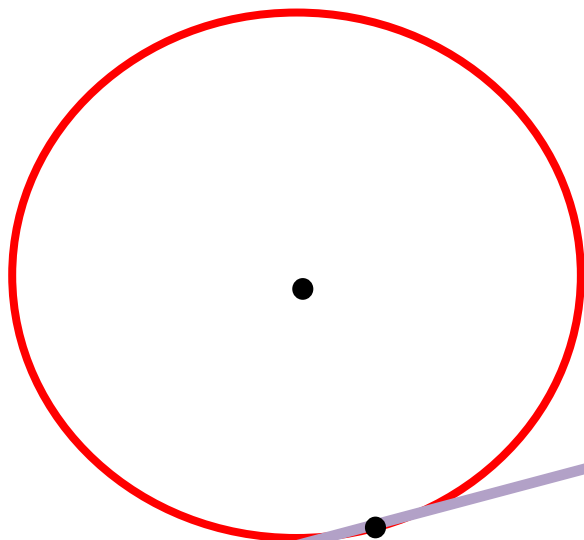
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**Chords and Arcs**

- The arcs of congruent chords are congruent.
- **Converse:** The chords of congruent arcs are congruent.

11

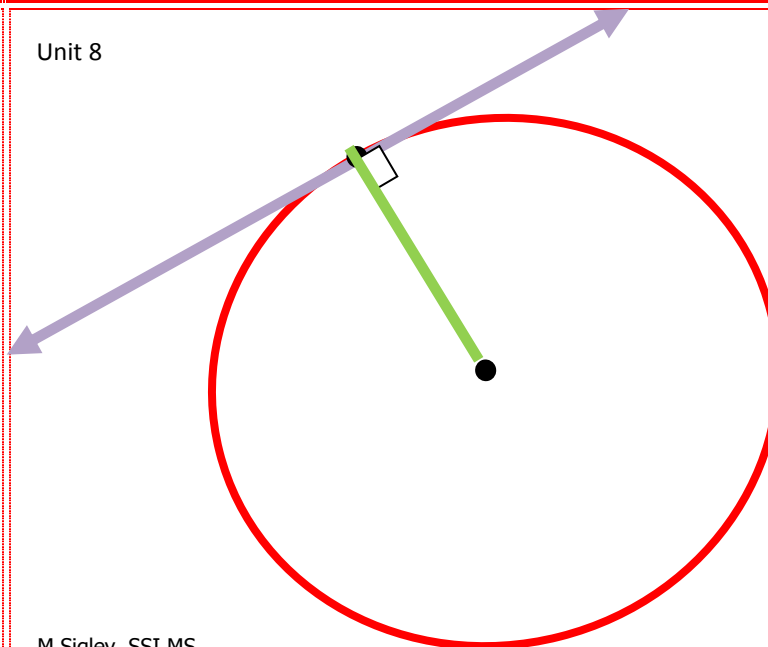
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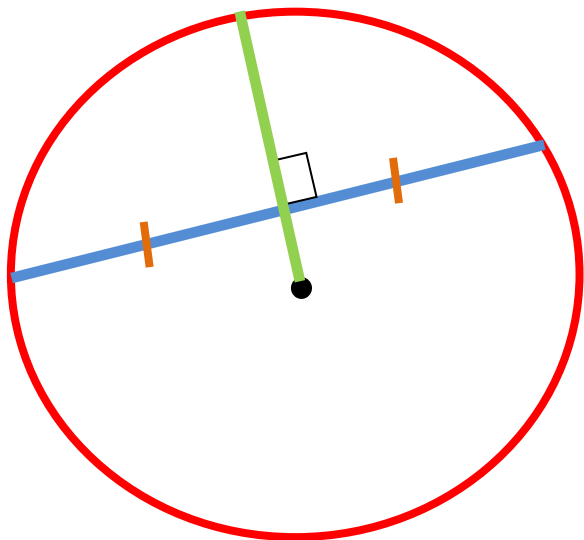
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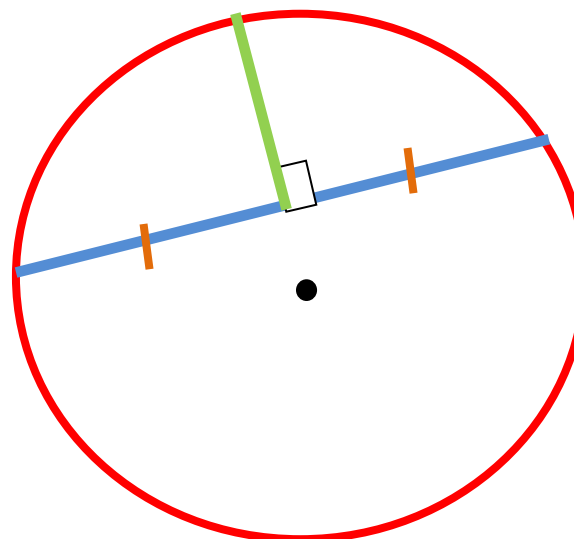
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## Tangent

- If a line is *tangent* to a circle, then the line is *perpendicular* to the radius drawn to the point of tangency.
- **Converse:** If a line is perpendicular to a radius at its endpoint, then the line is tangent to the circle.

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## Tangent

- A line in the plane of the circle that intersects the circle at exactly one point

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## Perpendicular Bisector

- The perpendicular bisector of a chord passes through the center of the circle.

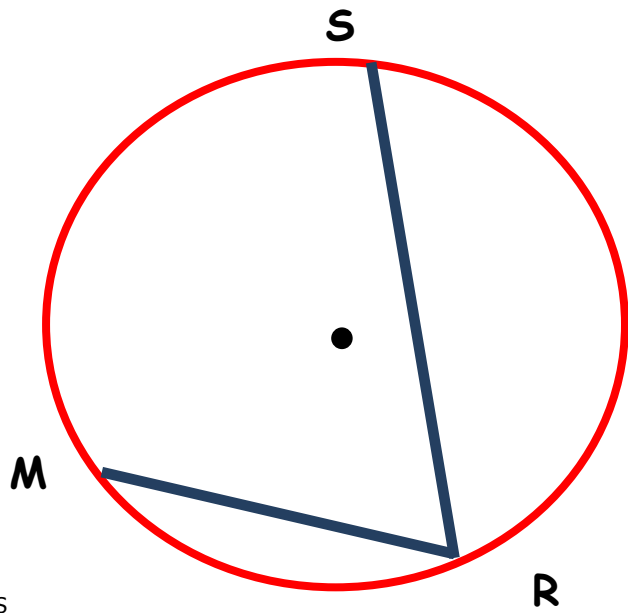
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## Radius and Chord

- A radius that is *perpendicular* to a chord of a circle *bisects* the chord.

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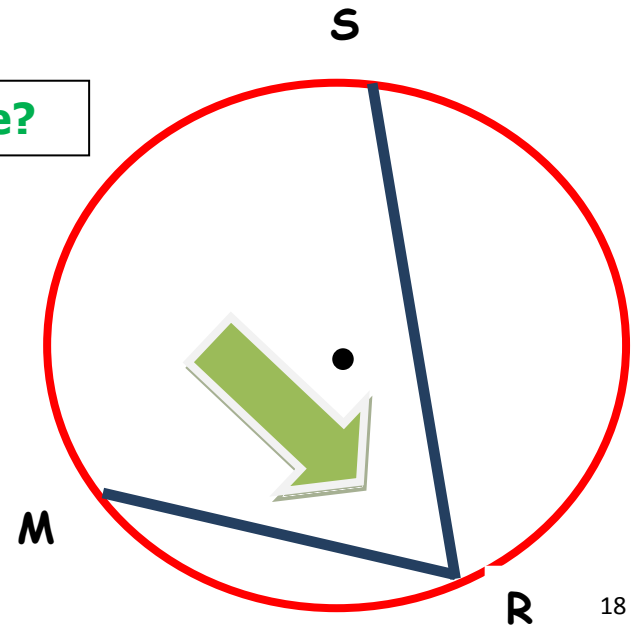


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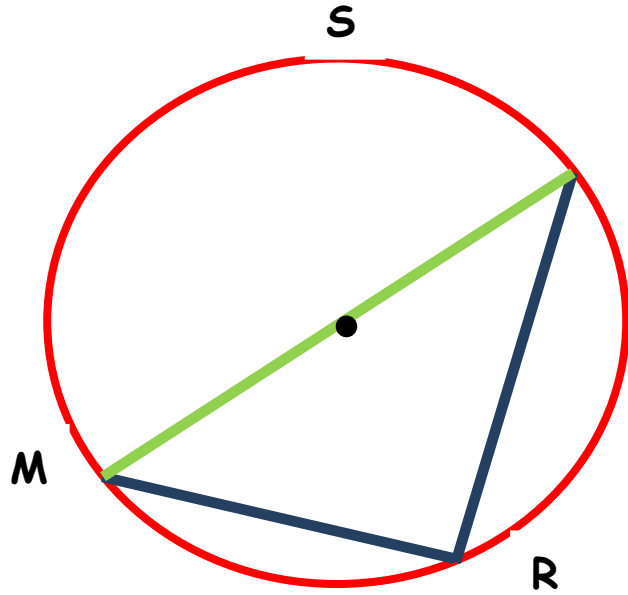
Measure?



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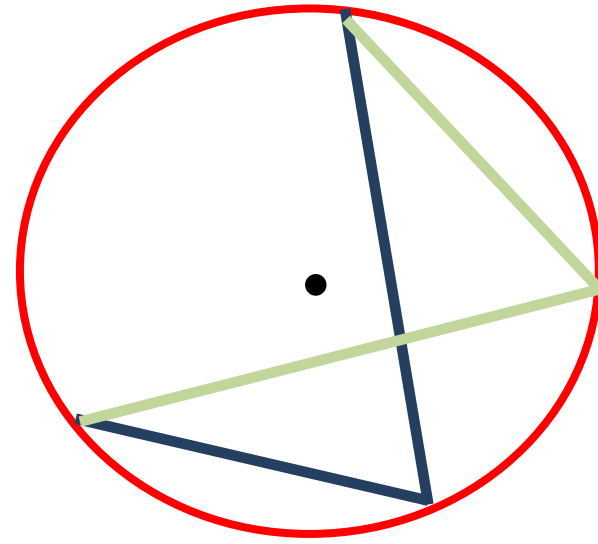
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### Inscribed Angle

- The measure of an inscribed angle is equal to **half** the measure of the intercepted arc.

### Inscribed Angle

- An angle whose vertex lies on a circle and whose sides are chords of the circle

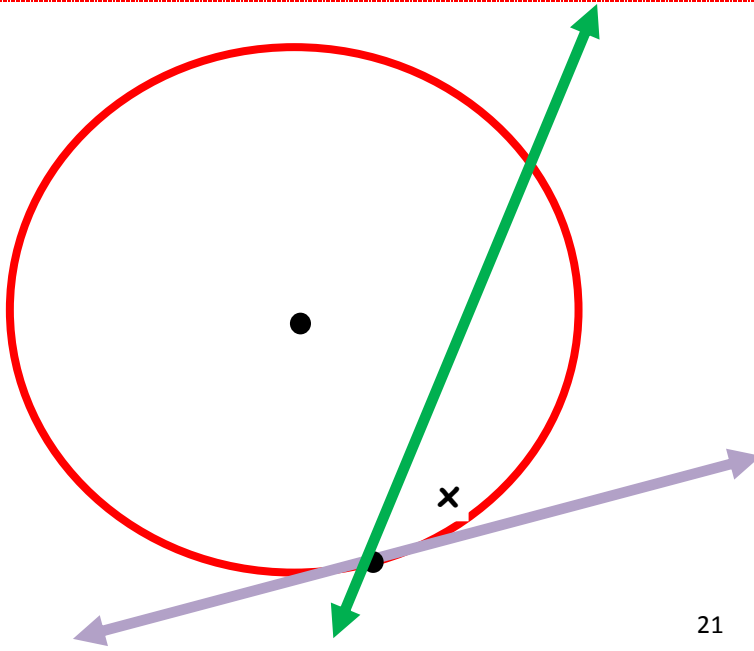
### Arc Intercepts

- Two inscribed angles that intercept the same arc have the same measure.

### Inscribed Angle to a Semicircle

- An inscribed angle that intersects a semicircle is a **right** angle.

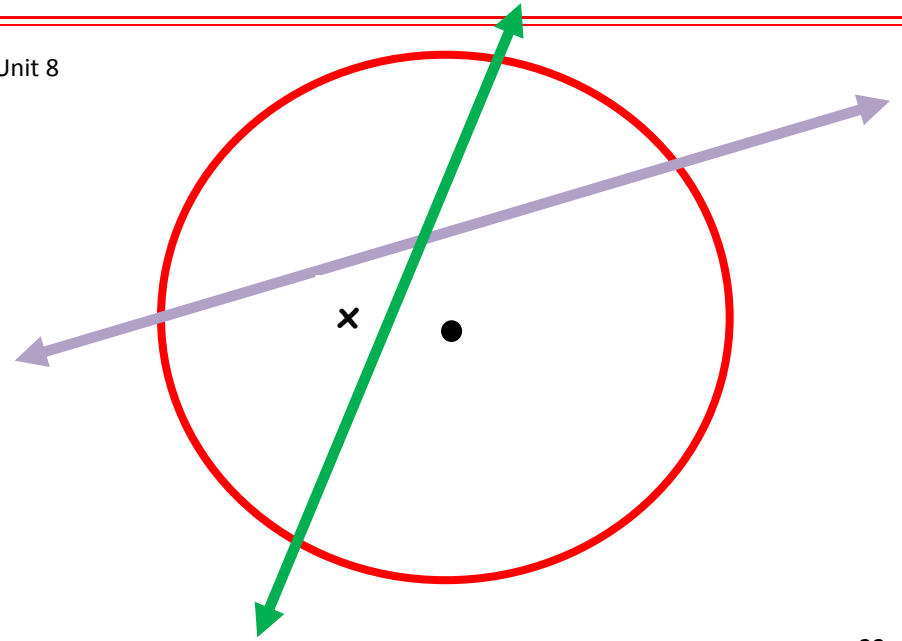
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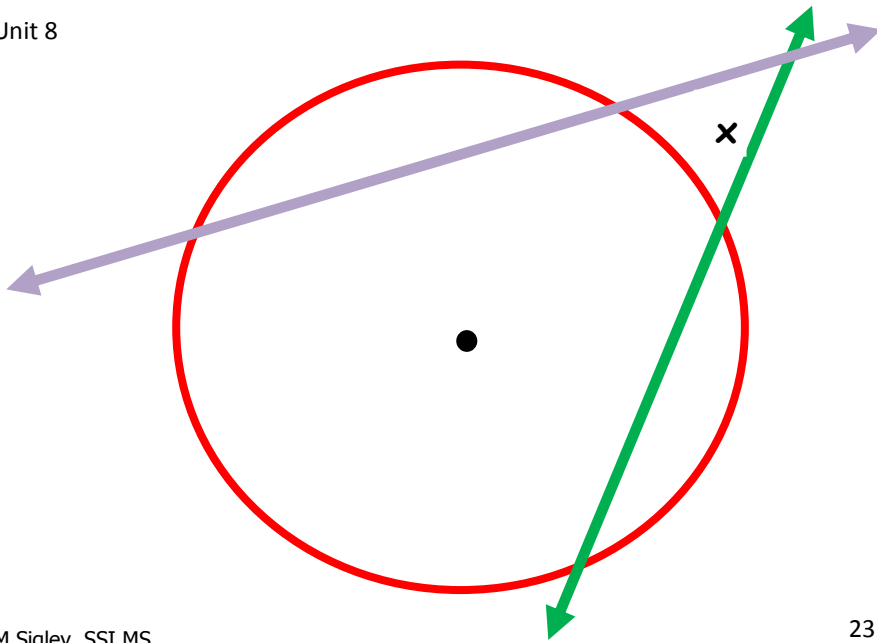
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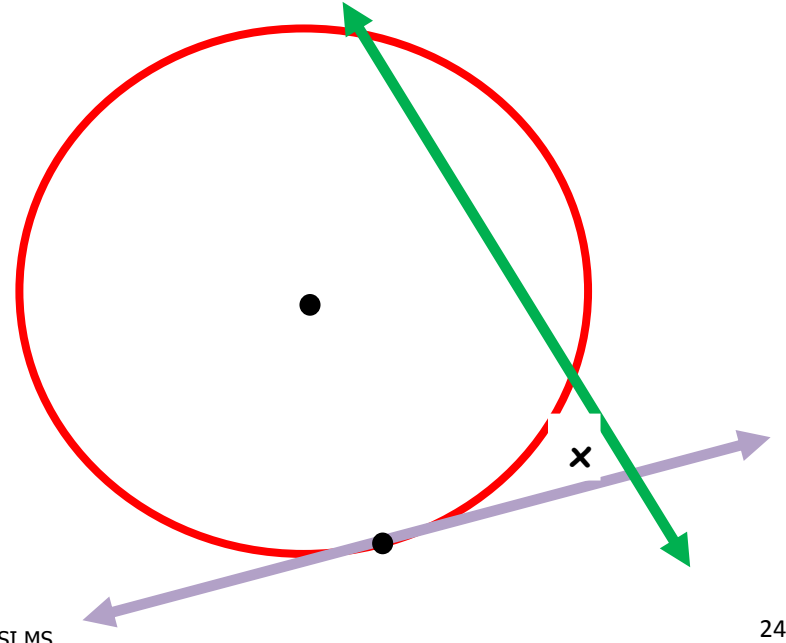
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## THEOREM

**Secant – Secant Interior Angle**

- The angle formed by two secants that intersect inside the circle is equal to the **half** the measure of the **sum** of the intercepted arcs.

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## THEOREM

**Tangent Secant Angle**

- The angle formed by a tangent and a secant is **half** the measure of the intercepted arc.

21

## THEOREM

**Tangent Secant Exterior Angle**

- The angle outside a circle formed by a tangent and a secant is **half** the measure of the **difference** intercepted arcs.

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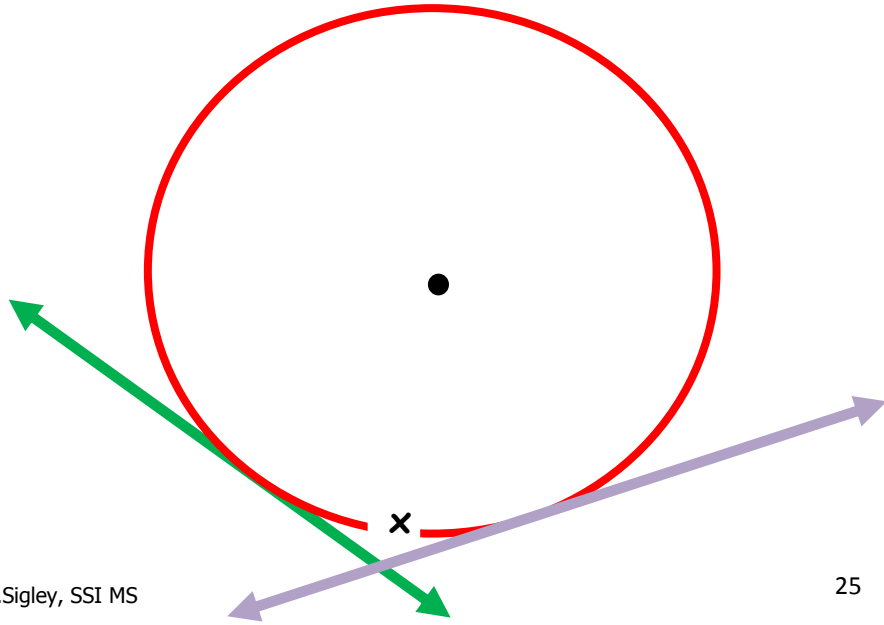
## THEOREM

**Secant – Secant Exterior Angle**

- The angle formed by two secants that intersect outside the circle is equal to the **half** the measure of the **difference** of the intercepted arcs.

23

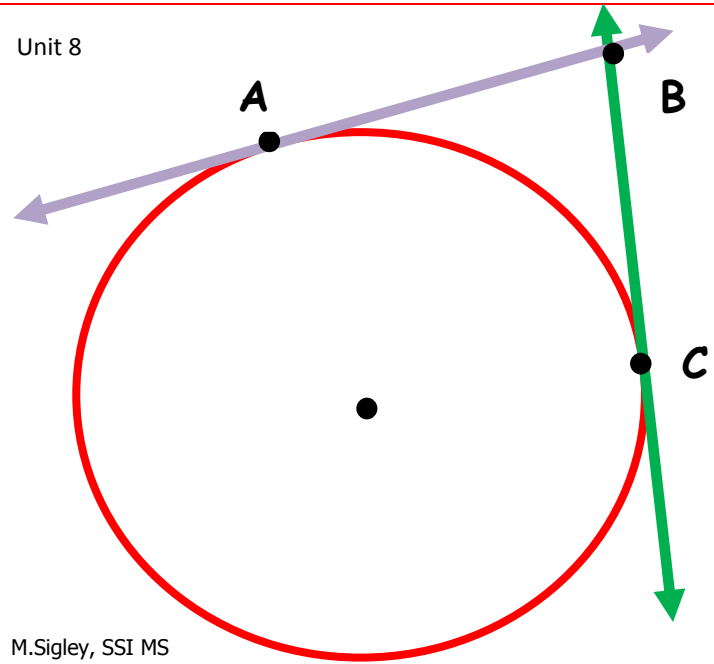
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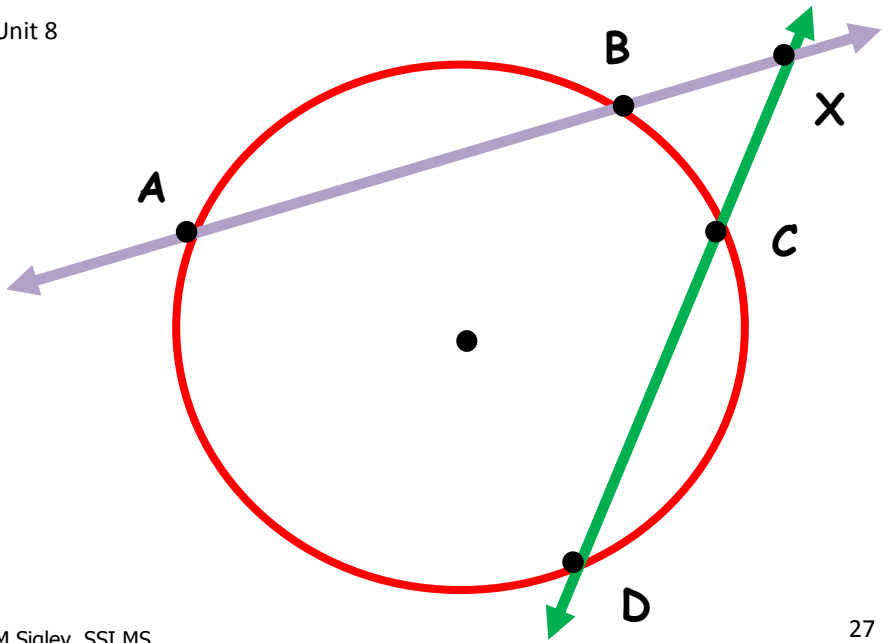
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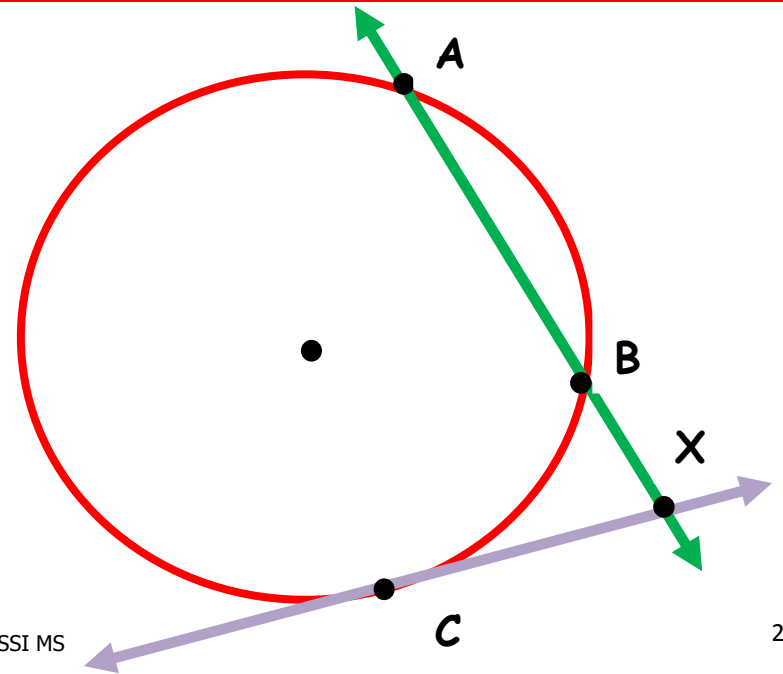
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## Tangent Segments

- The segments made by two tangents that intersect at the same point **outside** the circle are congruent. —
- $\underline{BA} \cong \underline{BC}$

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## Tangent-Tangent Exterior Angle

- The angle formed by two tangents to a circle is **half** the measure of the **difference** of the intercepted arcs.

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## Tangent Secant Segments

- If a tangent and a secant intersect **outside** a circle then the **product** of the *whole secant segment* and the *outside portion* of the segment are equal to the *square of the tangent* segment.
- $(\underline{XA})(\underline{XB}) = (\underline{XC})^2$

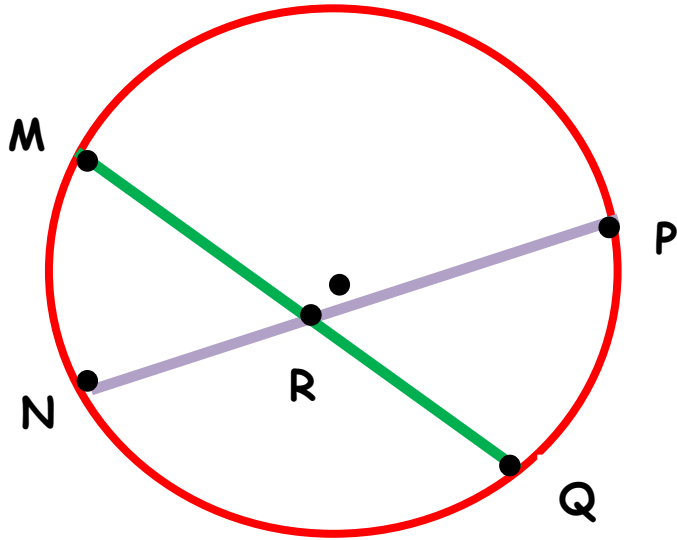
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## Secant Segments

- If two secants intersect **outside** a circle then the **product** of the *whole segment* of the first tangent and the *outside portion* of the segment are equal to the **product** of the other *whole segment* of the second tangent and its *outside portion*.
- $(\underline{XA})(\underline{XB}) = (\underline{XD})(\underline{XC})$

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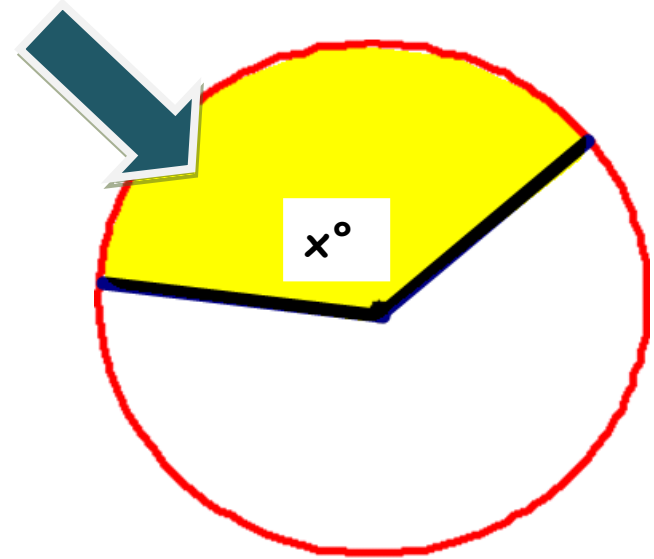
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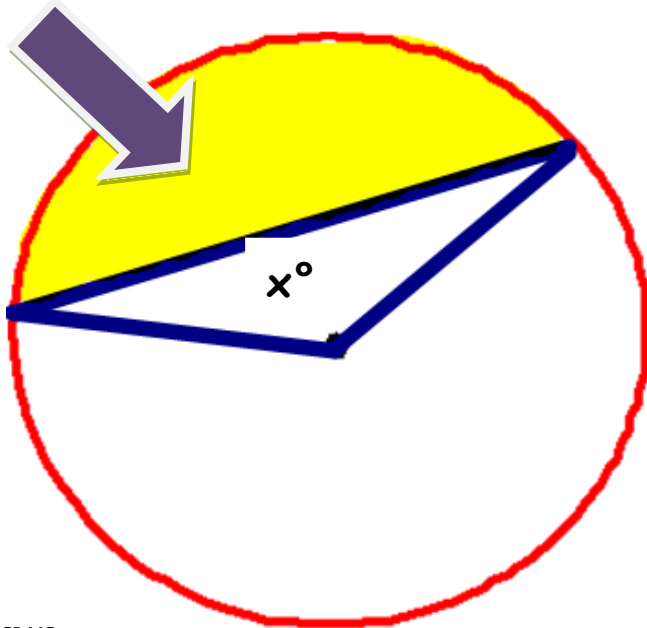
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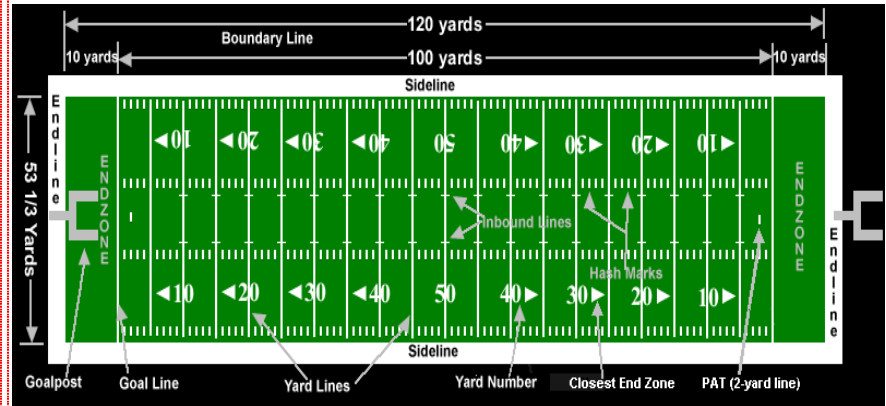


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# Locus



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**Area of a Sector**

- Measure of the central angle divided by 360 degrees multiplied by the area of the circle
- $A_{\text{sector}} = (x^\circ/360)(\pi r^2)$

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**Two Chord Segments**

- If two chords intersect inside a circle then the product of the lengths of segments of one chord are equal to the product of the lengths of the segments of the other chord.
- $(MR)(RQ) = (NR)(RP)$

29

**Locus**

- The set of all points that meet a stated condition

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**Area of a Segment**

- Area of a sector minus the area of the triangle
- $A_{\text{segment}} = [(x^\circ/360)(\pi r^2)] - (1/2 bh)$

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