Theorems on circle (only statements)
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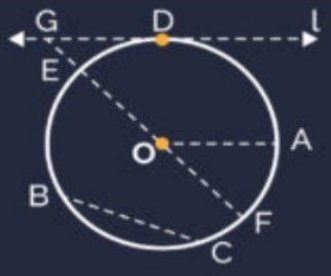
CIRCLES

For the circle shown besides,

O is the center,
OA is the radius,
EF is the diameter,
BC is the chord,
GF is the secant,
∠AOF is the central angle,
Line L is tangent with D as the point of contact.



Arc of a circle

An arc is a continuous piece of a circle. Two types of arc are

1. Minor arc

Arc with length less than half of circumference. In the fig. arc PAQ is a minor arc

2. Major arc

Arc with length more than half of circumference. In the fig. arc PBQ is a major arc

Pair of Circles

1. Concentric circles

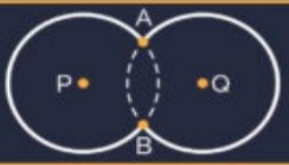
Two or more circles having same center but different radii

2. Congruent circles

Two or more circles having same radii but different centers

3. Circles touching in two points

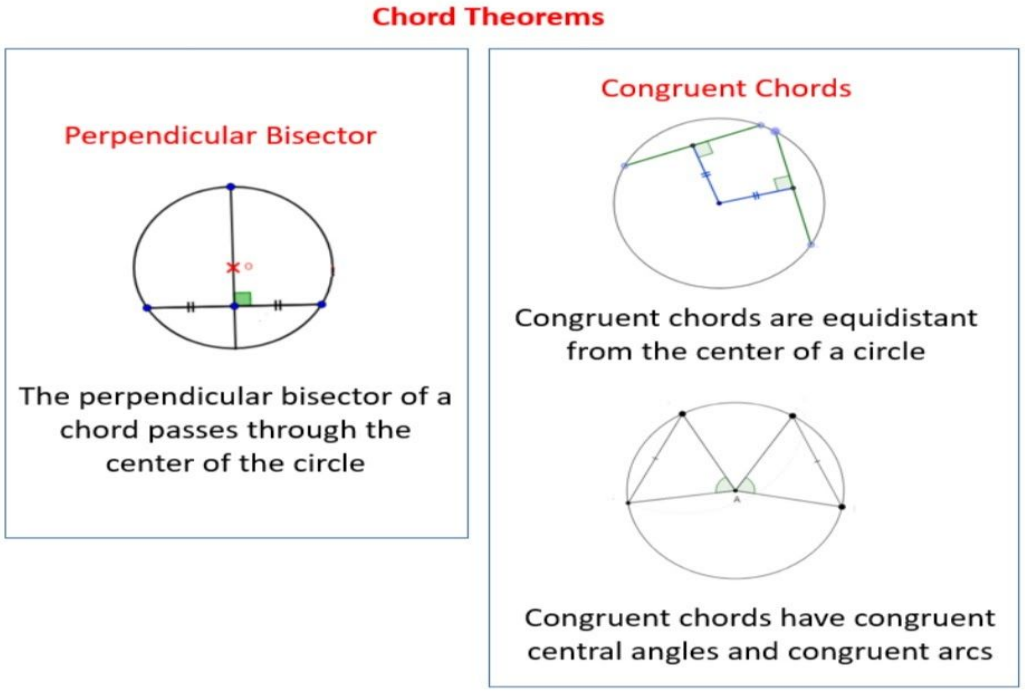
Two circles intersect each other in two different points



Theorem 1: Equal chords of a circle subtend equal angles at the center.
chords

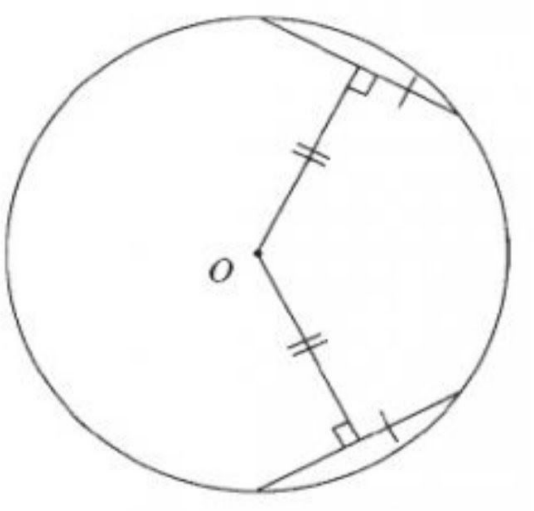
2. Theorem 2: This is the converse of the previous theorem. It implies that if two chords subtend equal angles at the center, they are equal.

3. Theorem 3: A perpendicular dropped from the center of the circle to a chord bisects it. It means that both the halves of the chords are equal in length.



4. Theorem 4: The line that is drawn through the center of the circle to the midpoint of the chords is perpendicular to it. In other words, any line from the center that bisects a chord is perpendicular to the chord.

5. Theorem 5: If there are three non-collinear points, then there is just one circle that can pass through them.



6. Theorem 6: Equal chords of a circle are equidistant from the center of a circle.

7. Theorem 7: This is the converse of the previous theorem. It states that chords equidistant from the center of a circle are equal in length.

8. Theorem 8: The angle subtended by an arc at the center of a circle is double that of the angle that the arc subtends at any other given point on the circle.

9. Theorem 9: Angles formed in the same segment of a circle are always equal in measure.

10. Theorem 10: If the line segment joining any two points subtends equal angles at two other points that are on the same side, they are concyclic. This means that they all lie on the same circle.

11. Theorem The sum of the opposite angles of a cyclic quadrilateral is supplementary.

Let ∠A, ∠B, ∠C and ∠D are the four angles of an inscribed quadrilateral. Then,

∠A + ∠C = 180°

∠B + ∠D = 180°

12.Theorem The exterior angle of a cyclic quadrilateral is always equal to the opposite interior interior angle.