Top 10 things to know about circles

1. A circle is the set of points in a plane that are equidistant from a given point \( O \) called the center.
2. The distance \( r \) from the center is called the radius, and the point \( O \) is called the center. Twice the radius is known as the diameter, \( d = 2r \).
3. The angle a circle subtends from its center is a full angle, equal to \( 360^\circ \) or \( 2\pi \) radians.
4. The perimeter \( C \) of a circle is called the circumference, and is given by \( C = 2\pi r = \pi d \).
5. The area of a circle is given by \( A = \pi r^2 \).
6. A central angle is an angle with endpoints \( A \) and \( C \) located on a circle's circumference and vertex \( O \) located at the circle's center.
7. For an inscribed angle and central angle with the same endpoints,

\[
\angle AOC = 2\angle ABC
\]

8. A tangent to a circle at a point \( p \) is perpendicular to the radius \( OP \).
9. The circumcircle is a triangle's circumscribed circle, i.e., the unique circle that passes through each of the triangle's three vertices. The center \( O \) of the circumcircle is called the circumcenter, and the circle's radius \( R \) is called the circumradius. A triangle's three perpendicular bisectors (i.e. the line perpendicular to the side from the midpoint of the side) meet at \( O \).
10. The incircle is the inscribed circle of a triangle, i.e., the unique circle that is tangent to each of the triangle's three sides. The center \( I \) of the incircle is called the incenter, and the radius \( r \) of the circle is called the inradius. The incenter is the point of concurrence of the triangle's angle bisectors.

About this document ...

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