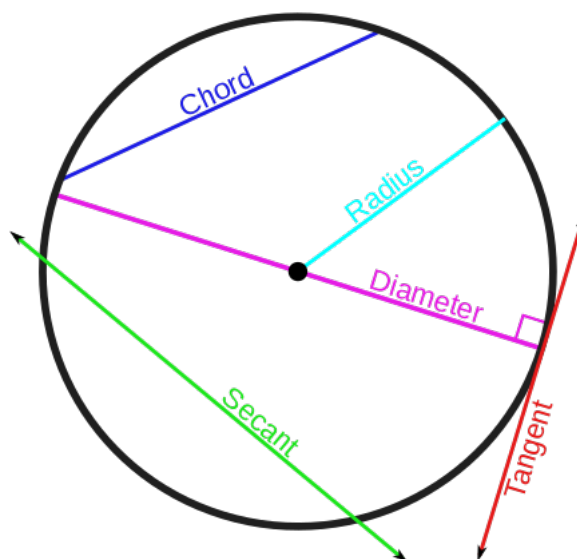# 1 Terminology

Figure 1: Circle Terminology

- **Radius:** a line segment joining the centre of a circle with any single point on the circle itself; or the length of such a segment, which is half (the length of) a diameter.

- **Chord:** a line segment whose endpoints lie on the circle, thus dividing a circle into two segments.

- **Diameter:** a line segment whose endpoints lie on the circle and that passes through the centre; or the length of such a line segment. This is the largest distance between any two points on the circle. It is a special case of a chord, namely the longest chord for a given circle, and its length is twice the length of a radius.

- **Sector:** a region bounded by two radii of equal length with a common center and either of the two possible arcs, determined by this center and the endpoints of the radii.

- **Tangent:** a co-planar straight line that has one single point in common with a circle ("touches the circle at this point").

2 Circle Equation

2.1 Center Radius Form

$$(x-a)^2 + (y-b)^2 = r^2$$

2.2 Parametric Form

$$x = a + r cos\theta$$
$$y = b + r sin\theta$$

Here θ is the parametric variable that ranges from 0 to 2π.

2.3 General Form

$$x^2 + y^2 + 2gx + 2fy + c = 0$$

By comparing with center-radius form we can see that, center of the circle is (-g,-f) and radius $\sqrt{g^2 + f^2 - c}$.

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