

L3 – Equation of a Circle

Unit 2

MPM2D

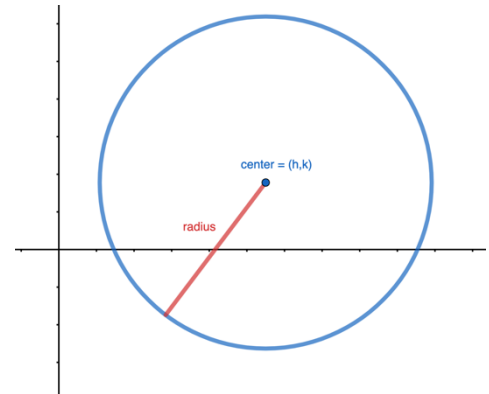
Jensen

A _____ is the set of all points that are the same distance from a fixed point, the center.

The _____ is the distance from the center of the circle to any point on the circle.

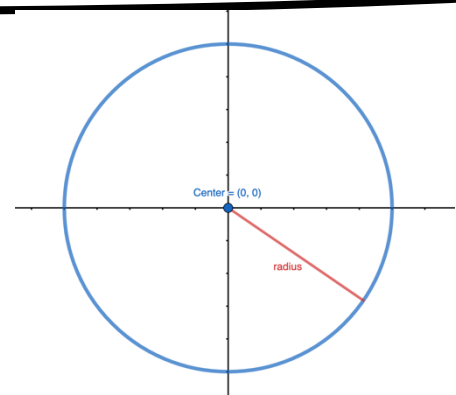
Equation of any circle:

The equation of a circle is defined based on the location of its center (h, k) and length of its radius, r .



Equation of a circle with center at ORIGIN

If the center of the circle is at the origin $(0,0)$, the equation simplifies.



Example 1: Write the equation of a circle with center $(0,0)$ and a radius of

a) 3

b) $\frac{1}{2}$

Example 2: What is the radius of a circle defined by the equation $x^2 + y^2 = 36$

Example 3: A circle has a center at the origin and passes through the point (5,3). Determine the equation of the circle.

Example 4: Is the point $(-5,9)$ inside, outside, or on the circle $x^2 + y^2 = 100$

Tip:

If point (x, y) is **ON** the circle $\rightarrow x^2 + y^2 = r^2$

If point (x, y) is **OUTSIDE** the circle $\rightarrow x^2 + y^2 > r^2$

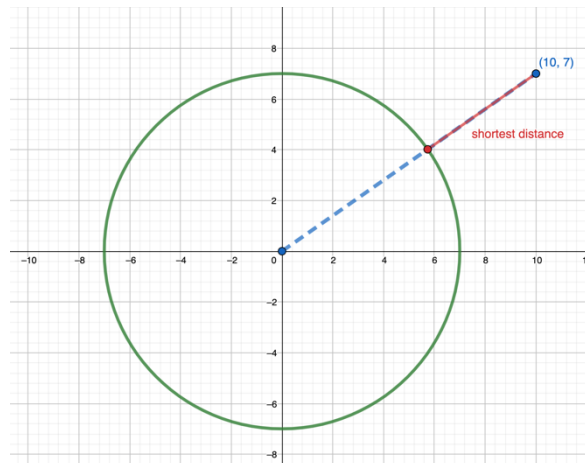
If point (x, y) is **INSIDE** the circle $\rightarrow x^2 + y^2 < r^2$

Example 5: Determine the equation of a circle with center at (3,4) and a radius of 8.

Example 6: Determine the shortest distance from the point $(10,7)$ to the edge of the circle $x^2 + y^2 = 49$

Tip:

The shortest distance is going to be in the direction of a line that goes through the center of the circle.



[geogebra link](#)