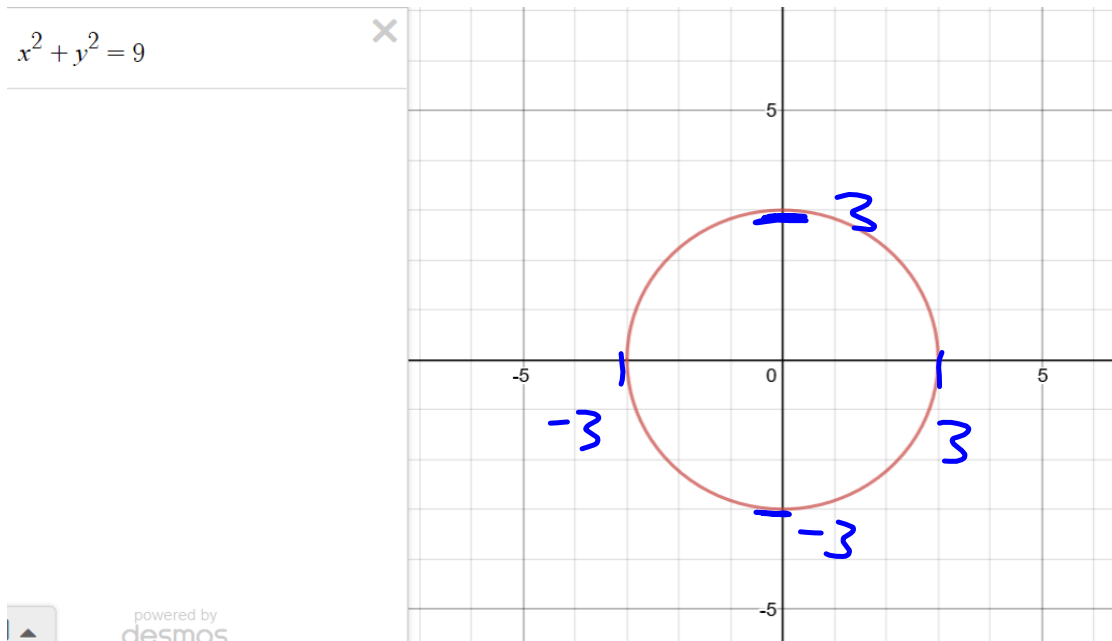# ConicS

Definition: A conic is a curve defined by the intersection of a plane and a conical surface.

- Circle

- Ellipse

- Hyperbola

- Parabola

Circle

A circle is a curve on which every point is equidistant from a given point called the center. The equation of a circle that is <u>centered at the origin</u> can be written in the form $x^2 + y^2 = r^2$, where r is the radius of the circle.
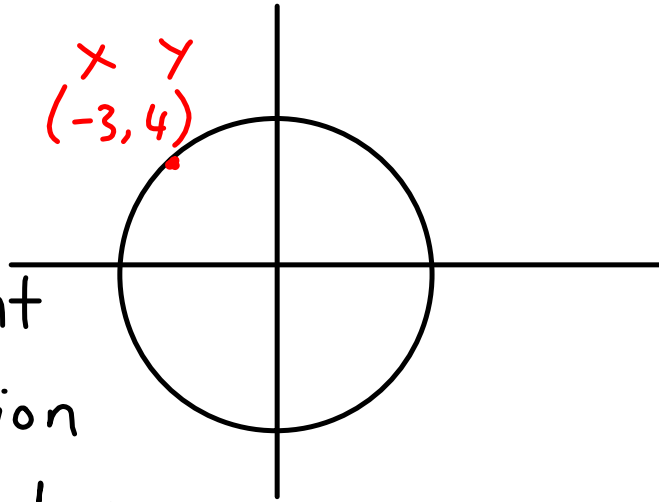
$x^2 + y^2 = 9$

Find the equation of a circle from given a point.

Ex:

1) $x^2 + y^2 = r^2$

$x \quad y$
$(-3, 4)$

Plug in the point
into this equation
and solve to find r

$$(-3)^2 + (4)^2 = r^2$$

$$9 + 16 = r^2$$

$$25 = r^2$$

$$r = \sqrt{25} = \pm 5$$

The equation of this circle is

$$x^2 + y^2 = 5^2$$

OR $x^2 + y^2 = 25$

4

Equation of a circle around any point - Standard Form

If the center of a circle is given by the point

(h,k), with a radius of r, then the equation of the circle around this point is

$(x-h)^2 + (y-k)^2 = r^2$

Ex: The equation of a circle around the point

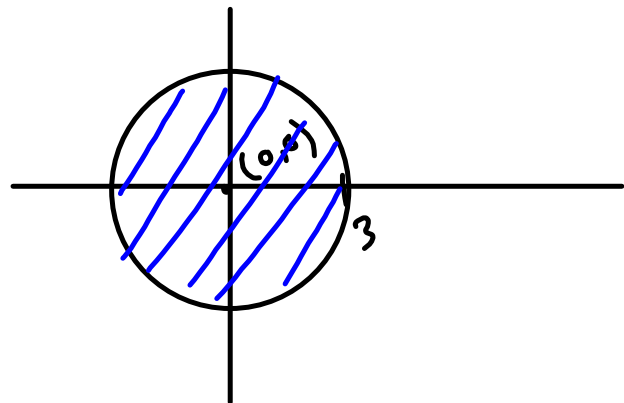(-3,2) with a radius of 5, in Standard Form is

$(x+3)^2 + (y-2)^2 = 25$

Circle with inequality

Given the equation of a circle with a inequality, you must shade either inside or outside the circle. To determine where to shade, use the center of any point in the circle as a test point. If it passes, shade inside, if it fails shade outside.

Ex:

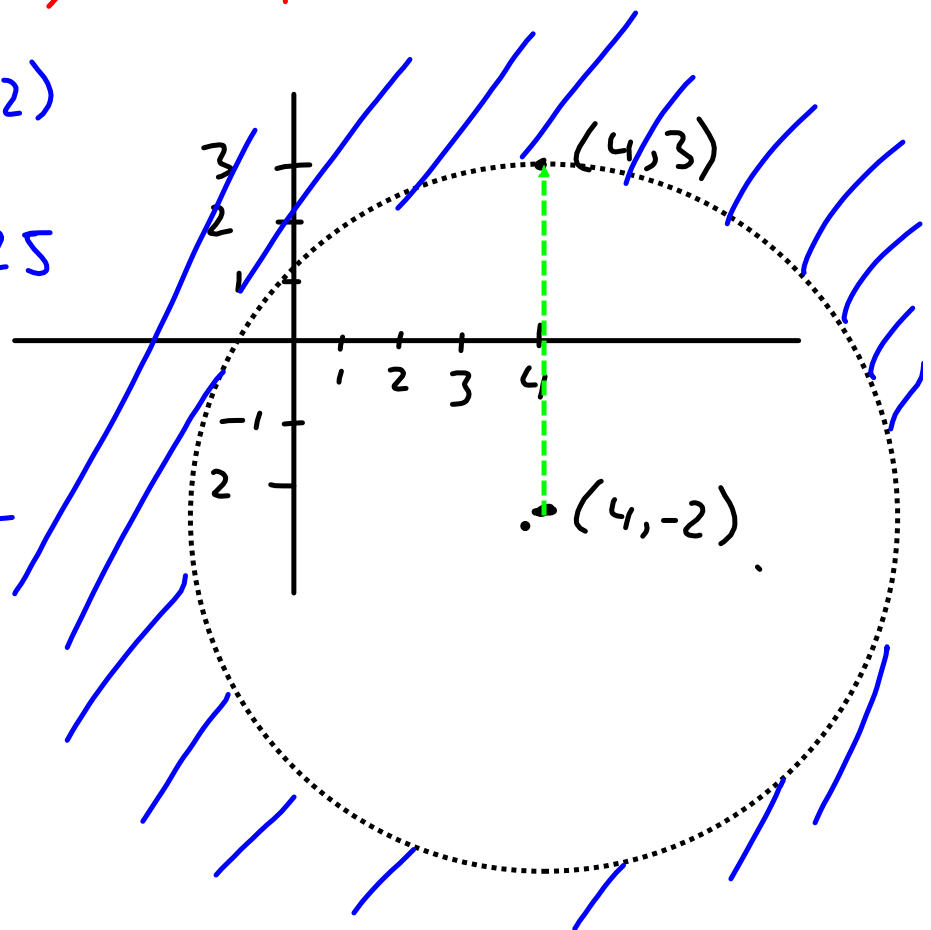$$x^2 + y^2 \leq 9$$

$$0^2 + 0^2 \overset{?}{\leq} 9$$

YES

Ex 2

$$(x-4)^2 + (y+2)^2 > 25$$

Plug in $(4,2)$

$$0^2 + 0^2 \overset{?}{>} 25$$

$$0 \overset{?}{>} 25$$

No-FAIL

(4,3)

(4,-2)

p 323, 325

Q 1, 2, 3, 4, 5, 6, 7, 8.

$$D = \sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$$