

Conics and Inequalities

Goal:

- to graph the region described by a conic inequality
- to determine whether or not a point belongs to the region described by a conic inequality

All the points located on a conic are represented by its equation.

For example: Is the point (6,-8) located on the circle $x^2+y^2=100$?

$$6^2 + (-8)^2 \stackrel{?}{=} 100$$

$$36 + 64 = 100 \checkmark$$

The pt. (6,-8) is on the circle

When using an inequality instead of an equation all the points inside (or outside) the conic are being represented.

For example: Graph the region represented by $x^2+y^2 < 36$.

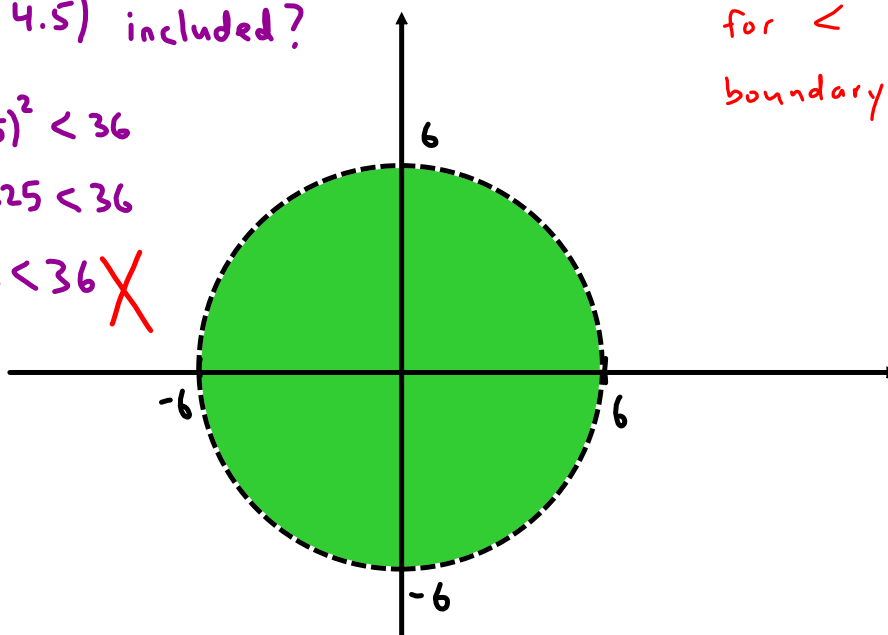
Is (4, 4.5) included?

$$4^2 + (4.5)^2 < 36$$

$$16 + 20.25 < 36$$

$$36.25 < 36 \text{ X}$$

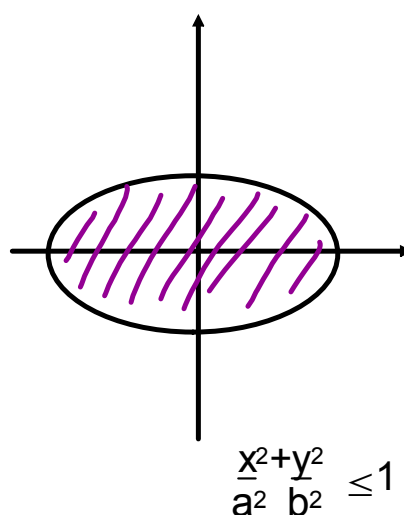
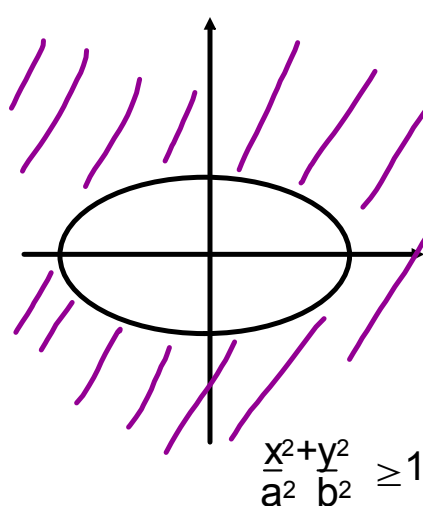
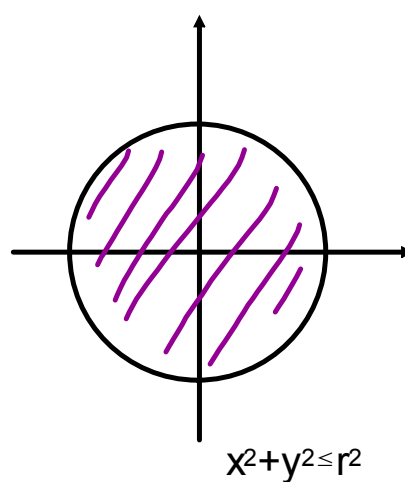
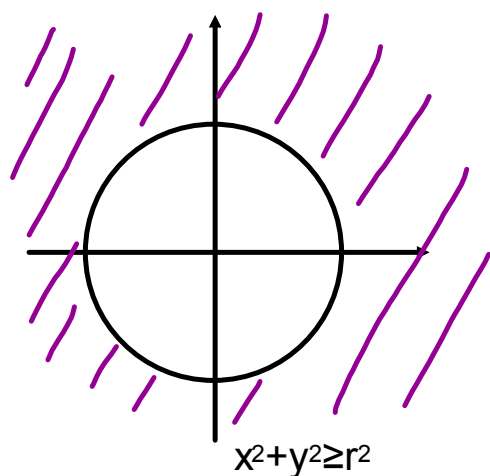
for $<$ or $>$
boundary is dotted



For circles and ellipses graphical representation of the inequality can be easily understood.

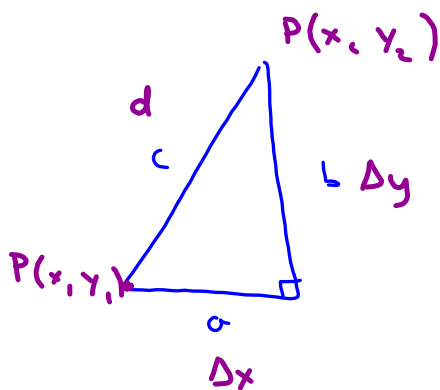
Greater than (or equal to) \Rightarrow outside

Less than (or equal to) \Rightarrow inside



p.179 #9,13,14,18

$$c^2 = a^2 + b^2$$



$$d = \sqrt{\Delta x^2 + \Delta y^2}$$