Course Number
Instructor
Date

Section 6.5 Rotation of Conics

Objective: In this lesson you learned how to eliminate the *xy*-term in the equation of a conic and use the discriminant to identify a conic.

Important Vocabulary	Define each term or concept.
Invariant under rotation	
Discriminant	

I. Rotation (Pages 440–443)

What you should learn
How to rotate the coordinate axes to eliminate the *xy*-term in the equation of a conic

The general equation of a conic whose axes are rotated so that they are not parallel to either the *x*-axis or the *y*-axis contains a(n) _________________.

To eliminate this term, you can use a procedure called _____________________, whose goal is to rotate the *x*- and *y*-axes until they are parallel to the axes of the conic.

The general second-degree equation

$Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$ can be rewritten as

$A'(x')^2 + C'(y')^2 + D'x' + E'y' + F' = 0$ by rotating the

coordinate axes through an angle θ, where

cot 2θ = _______________________.

The coefficients of the new equation are obtained by making the substitutions x = ___________________________________ and

y = _________________________________.

II. Invariants Under Rotation (Pages 444–445)

> ***What you should learn***
> How to use the discriminant to classify a conic

The rotation of the coordinate axes through an angle q that transforms the equation $Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$ into the form $A'(x')^2 + C'(y')^2 + D'x' + E'y' + F' = 0$ has the following rotation invariants:

1)

2)

3)

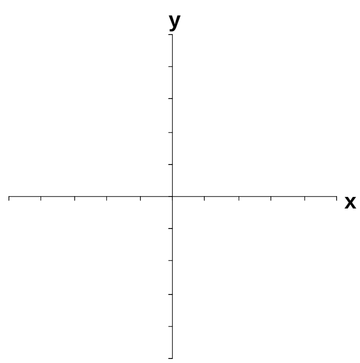
The graph of the equation $Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$ is, except in degenerate cases, determined by its discriminant as follows:

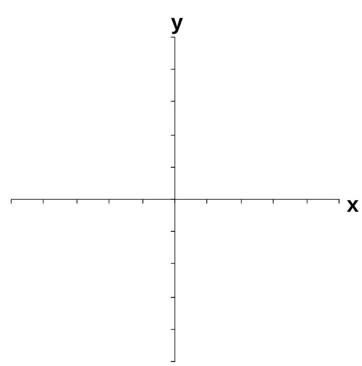
1) Ellipse or circle if: ____________________

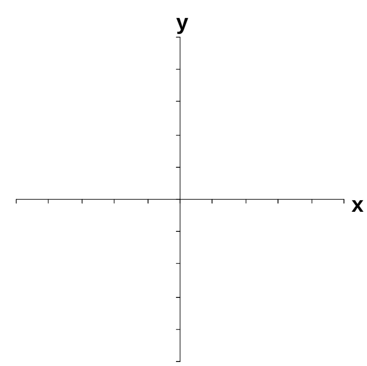
2) Parabola if: ____________________

3) Hyperbola if: ____________________

Example 1: Classify the graph of the following conic:
$2x^2 + 12xy + 18y^2 - 3y - 5 = 0$







Homework Assignment

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