**Sections 9.4 and 9.6 Summary** (Rotation of Axes / Conic Sections in Polar Coordinates)

Section 9.4 (Rotation of Axes)

Given a conic equation (Ax2 + Cy2 + Dx + Ey + F = 0) not in standard form such as ., we can determine which conic section we have by examining A, C, and AC (coefficient of x2, y2)…

 A = C, circle AC = 0, parabola AC > 0, ellipse AC < 0, hyperbola

Example: Identify the graph of each of the following

3x2 + 2y2 + 12x – 4y + 2 = 0

x2 + y2 – 6x + y + 3 = 0

y2 – 12x – 4y + 52 = 0

9x2 – 16y2 – 90x + 64y + 17 = 0

The presence of an xy-term in conic equations sometimes rotates the conic over a given angle



See page 916 and Example 2 in the book (and Ex. 3 result on pg. 920)



Section 9.6 (Conic Sections in Polar Coordinates)

Another way to represent conic sections is through polar equations (remember r, θ) using eccentricity

Equation Forms :

 r = $\frac{ep}{1+/-e\cos(θ)}$

 r = $\frac{ep}{1+/-e\sin(θ)}$

 e = eccentricity

 p = dist. from focus

 to directrix

SEE BOOK EXAMPLES FOR MORE