AP Calculus
Introduction to Conics Worksheet

All work must be shown in this course for full credit. Unsupported answers may receive NO credit.

1. Explain why the circle, parabola, ellipse and hyperbola are referred to as "conic sections".

2. Graph each of the following equations:

a) $\dfrac{(x-4)^2}{9} + \dfrac{(y+3)^2}{16} = 1$

b) $\dfrac{(x+5)^2}{4} - \dfrac{(y-1)^2}{25} = 1$

c) $y = 4(x-2)^2 + 3$

d) $\dfrac{(x-8)^2}{3} + \dfrac{(y+2)^2}{3} = 1$

e) $9y^2 - 4x^2 = 36$

f) $y = \sqrt{16 - (x+2)^2}$

3. Graph the equation $x^2 + y^2 + 6y - 18 = 0$. *[Hint: Use Completing the Square to write in a form that is familiar]*

4. For each of the following use the given the description to …
                i) write an equation for the conic
                ii) graph the given conic

    a) circle, centered at (4, –2), radius of 2

    b) ellipse, centered at (–3,5), stretched 2 units horizontally and 5 units vertically

    c) hyperbola that opens up and down, centered at (7, 2), stretched 3 units vertically and 4 units horizontally.

5. Each of the following give equations for conic sections and tell how the conic is translated.
                i) Write an equation for the NEW conic
                ii) Graph the NEW conic

    a) $\dfrac{x^2}{6} - \dfrac{y^2}{5} = 1$ … shifted up 2 and left 3.

    b) $16x^2 + 9y^2 = 144$ … shifted down 3 and right 4.