Math 35 Midterm 5 – Fall 2012

Directions: This is a take home exam (worth 20 points) and will be due on the day of the Final Exam. Your answers must be justified by your work and all work must be shown and legible to receive any credit. In addition, you may work with whomever you like but you must give that person credit. Failure to do so will result in a zero!

1. State the type of conic section and then put it into “hk-form”. Do not graph!
   a)  \( x = -2y^2 - 6y + 3 \)
   b)  \( x^2 + 4x - 2y^2 - 8y = 20 \)
   c)  \( x^2 + 4x + 2y^2 + 8y = 1 \)
   d)  \( x^2 + 6x + y^2 - 10y + 3 = 13 \)

2. Graph a detailed graph of the following conic section.
   a)  \( \frac{(x-3)^2}{16} + \frac{(y+2)^2}{4} = 1 \)
   b)  \( \frac{(x+2)^2}{25} - \frac{(y+3)^2}{9} = 1 \)
3. Find the equation of parabola if the endpoints of the focal length are \((2, 3)\) and \((4, 3)\) and the directrix is \(y = -1\).

4. Given 3, 7, 11, 15, 19, ... Find the \(a_{20}\) and \(S_{20}\).

5. Given 10, 5, \(\frac{5}{2}, \frac{5}{4}, \frac{5}{8}, \ldots\) Find the \(a_{20}\) and \(S\).

6. Evaluate \(\sum_{n=2}^{4} (n^2 + 1)\)

7. Expand the binomial \((2x - y)^4\) using any method you choose.