1. Math 494 Homework 1

This homework is due Wednesday September 1 in the beginning of class. No late homework will be accepted. You may collaborate on the homework. However, the final write-up must be yours and should reflect your own understanding of the problem. Please be sure to properly cite any help you get. The following problems refer to problems in the book.

Problem 1.1. Find an equation for the circle in the plane that contains the three points
$$(0,0), (1,1), (2,-2).$$

Problem 1.2. Find an equation for the conic section in the plane that contains the five points
$$(0,0), (1,1), (1,0), (0,1), (2,3).$$

Problem 1.3. Calculate the integral
$$\int_1^y \frac{dx}{\sqrt{x^5 + x^4}}.$$

Problem 1.4. Find all the rational solutions of the equation
$$x^2 - 2y^2 = 1.$$

Problem 1.5. Find all the integer solutions of the equation
$$x^2 + 3y^2 = 10.$$