

# Homework 15

Name:

Date: August 10, 2015

**P 1.** Consider the family of curves

$$\frac{x^2}{9} + \frac{y^2}{4} = 1$$

Find the orthogonal family of curves. For each family, sketch two trajectory curves.

**P 2.** A 100-gallon tank is full of a solution containing 25 pounds of a concentrate. Starting at time  $t = 0$ , distilled water is admitted to the tank at a rate of 5 gallons per minute, and the well-stirred solution is withdrawn at the same rate.

- (a) Find the amount  $Q$  of the concentrate in the solution as a function of  $t$ .
- (b) Find the time when the amount of concentrate in the tank reaches 15 pounds.