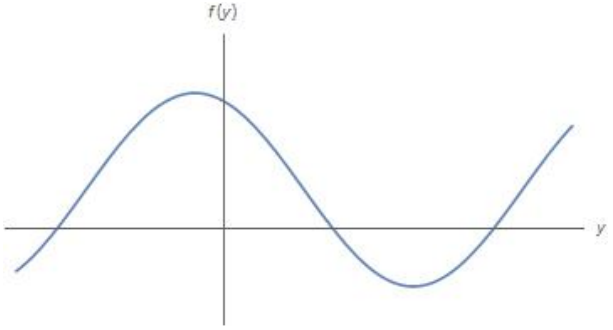
Math 2410-10/15 **Quiz #2** **January 30th, 2017**

Note: Partial credit can not be awarded unless there is legible work to assess.

1. Suppose we know that the graph to the right is the graph of the right-hand side $f(y)$ of the differential equation

$$\frac{dy}{dt} = f(y).$$

Give a rough sketch of the slope field that corresponds to this differential equation.



2. A 5-gallon bucket is full of pure water. Suppose we begin dumping salt into the bucket continuously at a rate of 1/4 pounds per minute. Also, we open a spigot so that 1/2 gallons per minute leaves the bucket, and we add pure water to keep the bucket full. Finally, we ensure the salt water solution is always well mixed. Give a differential equation which models the change in the amount of salt in the bucket over time.
Note: You do not need to solve this differential equation.
Bonus: (1 point) How much salt do you expect to be in the solution after a very, very long time?