Math 321   Class Exercises, January 26th   **Winter 2018**

A tank contains 800 gallons of water with 200 pounds of salt dissolved in it. At some time a 0.1 lb/gal salt solution begins to be pumped in at 15 gal/min and, at the same time, thoroughly mixed solution is pumped out of the tank at 15 gal/min.

(a) Letting A represent the amount of salt in the tank at any time t, sketch a graph of A versus t. Label axes with variables, units, and any numbers you can.

(b) At what rate is salt entering the tank?

(c) At what rate is salt leaving the tank? (Your answer should not be just a number!)

(d) What is the net rate of change of the amount of salt in the tank?

(e) Your answer to (d) is equal to what derivative? Write a differential equation based on this!

(f) If I haven't stopped you yet, solve the differential equation. You should be able to do it with either separation of variables or the integrating factor method. Try both!