A 10 gallon container is full of pure water. Suppose we begin dumping salt into the water at a rate of 1/8 pounds per minute. We also open a tap so that 1/2 gallon of water/salt solution leaves the container per minute. Assume that the water/salt solution is always well mixed.

1. (6) Derive a differential equation which models the amount of salt in solution at time $t$.

2. (4) Derive a differential equation which models the concentration of salt in the container.