A tank with a capacity of 500 *gal* originally contains 200 *gal* of water with 100 lb of salt in solution.Water containing a salt concentration of 1 *lb/gal* enters the tank at a rate of 3 *gal/min,* and the mixture is allowed *to* flow out of the tank at the rate of 2 *gal/min.*

1. Find the amount of salt in the tank at any time prior to the instant that the tank begins to overflow.
2. Find the amount of salt in the tank at the instant that the tank begins to overflow