

MATH 246 Groupwork 1.6

Name: _____

1. You are hired to analyze the number of members a certain social media site. You find that members recruit friends which results in a monthly growth of 2% but that members are also leaving the site at 15 per month. Suppose the site started with 1000 members.
 - (a) Solve the corresponding differential equation to find the number of members at time t .

- (b) Will the number of members drop to zero? If so, after how many months?

2. A tank initially contains 100L of saltwater with a concentration of 0.1kg/L. Saltwater with a concentration of 0.3kg/L is being pumped in at 20L/min while the tank is being emptied of the mixture at the same rate.
- (a) Solve the corresponding differential equation to find the amount of salt in the tank at time t .

- (b) At what time will there be 20kg of salt in the tank?

3. Suppose a skydiver has a drag coefficient of 0.0018m^{-1} .

(a) What is her terminal velocity?

(b) Solve the corresponding differential equation to find her velocity at time t .