

Math 3331- HW4

1. Suppose a population of rabbits are formed. Initial there are 15 rabbits and it is observed that after 90 days there are an additional 12 rabbits. If the area in which the rabbits live is limited to 500, formulate a differential equation and solve to determine the number of rabbits at a given time.
2. A fluid initially at 100°C is placed outside on a day when the temperature is 10°C , and the temperature of the fluid drops 20°C in one minute. Find the temperature $T(t)$ of the fluid for $t > 0$. (pg. 148 Trench Q2)
3. A tank initially contains a solution of 10 pounds of salt in 60 gallons of water. Water with $1/2$ pound of salt per gallon is added to the tank at 6 gal/min, and the resulting solution leaves at the same rate. Find the quantity $A(t)$ of salt in the tank at time $t > 0$. (pg 148 Trench Q9).
4. A 1200-gallon tank initially contains 40 pounds of salt dissolved in 600 gallons of water. Starting at $t = 0$, water that contains $1/2$ pound of salt per gallon is added to the tank at the rate of 6 gal/min and the resulting mixture is drained from the tank at 4 gal/min. Find the quantity $A(t)$ of salt in the tank at any time $t > 0$ prior to overflow. (pg 148 Trench Q14).

Due: Friday Feb. 26, 2026