Math 122 - #14
Differential Equation: $y' = k(y - b)$

1. Find the general solution of $y' = -3(y - 2)$ and graph the two solutions satisfying $y(0) = 0$ and $y(0) = 4$.

2. Solve $y' + 6y = 12$ and $y(2) = 10$

3. A 500-lb roast initially at 50^oF is put into a 375^oF oven when $t = 0$. The temperature y of the roast is 125^oF when $t = 75$ min. When will the roast be 150^oF?

4. A room has a constant temperature of 60^o. If a body in the room cools from 100^o to 90^o in 10 minutes, how much longer will it take for its temperature to decrease to 80^o?

5. A glass of lemonade with temperature of 40^oF is left to sit in a room with constant temperature of 70^oF. If the temperature is 52^oF after 1 hour, what will the temperature be after 5 hours?

6. A frozen turkey (0^o F) is placed in a hot oven. After 1 hour the turkey is 43.775^o. After 3 hours, the temperature is 119.24^oF. What is the temperature of the oven?

Answers

1. $y = 2 + ce^{-3t}$

2. $y = 8e^{12-6t} + 2$

3. 105 mins

4. 14.09 min

5. 67^oF

6. 460^o F