**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 5-lb roast initially at 50°F is put into a 375°F oven when $t = 0$. The temperature $T(t)$ of the roast is 125°F when $t = 75$ min. When will the roast be 150°F?

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

**5.** A glass of lemonade with temperature of 40°F is left to sit in a room with constant temperature of 70°F. If the temperature is 52°F 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°. After 3 hours, the temperature is 119.24°F. 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°F

**6.** $460^o$ F