Read each problem **very carefully** before starting to solve it and do only what is asked. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. [4 points] Use the integrating factor method to find the particular solution of

$$\frac{1}{t}y' + 2y = 2, \quad y(0) = 10.$$

2. [6 points] A jar contains initially 5 gallons of unsalted tomato juice. Salted juice, containing 4 grams of salt per gallon, is poured into the jar at the rate of 1 gallon/minute, while the mixed juice is being emptied from the jar at the same rate. Write and solve a differential equation to find the amount $Q(t)$ of salt in the jar at time t.