Circle True or False or leave blank. (1 point for correct answer, -1 for incorrect answer, 0 if left blank)

1. True   False   A solution to an IVP may not always exist nor be unique.

2. True   False   In order to verify that $a_n = f(n)$ is a solution to a recurrence equation, we need to solve the recurrence equation and see if it matches with $f(n)$.

Show your work and justify your answers. Please circle or box your final answer.

3. (10 points) (a) (4 points) Find the solution to $a_n = a_{n-1} + 2a_{n-2}$ with $a_0 = 0, a_1 = 3$.

(b) (2 points) Verify that $n - 3$ is a solution to $a_n = 2a_{n-1} - a_{n-2}$.

(c) (4 points) Find the general solution to $y' + y = e^{-t}$.