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

1. True   False   The recurrence relation $a_n = 2a_{n-1} + 3a_{n-2} + n$ has constant coefficients.

2. True   False   The recurrence relation $a_n = n^2 a_{n-2}$ is linear.

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

3. (10 points) For all three parts, consider the recurrence relation $a_n = (4-n)a_{n-1} + a_{n-2}^2$ with $a_0 = 0, a_1 = 1$.

    (a) (3 points) Calculate a_2, a_3, and a_4. Show your work.

    (b) (2 points) Find the order and determine whether it is homogeneous, linear and/or has constant coefficients. Justify all your answers.

    (c) (5 points) Verify that $a_n = n$ is the solution to this recurrence problem.