3) (10 pts) ANL (Recurrence Relations)

What is the closed form for the following recurrence relation, T(N)? For full credit your work must be shown.
Note: Your answer should be **<u>EXACT</u>** and not a Big-Oh bound.

$$T(N) = 2T(N - 1) + N \text{ (for integers N} \geq 1)$$
$$T(0) = 0$$

Computer Science Foundation Exam

January 14, 2023

Section D

ALGORITHMS

NO books, notes, or calculators may be used,
and you must work entirely on your own.

Name: _____

UCFID: _____

Question #	Max Pts	Category	Score
1	10	DSN	
2	10	DSN	
3	5	ALG	
TOTAL	25		

You must do all 3 problems in this section of the exam.

Problems will be graded based on the completeness of the solution steps and <u>not</u> graded based on the answer alone. Credit cannot be given unless all work is shown and is readable. Be complete, yet concise, and above all <u>be neat</u>. For each coding question, assume that all of the necessary includes (stdlib, stdio, math, string) for that particular question have been made.