3) (10 pts) ANL (Recurrence Relations)

Use the iteration technique to solve the following recurrence relation in terms of n:

$$T(n) = 3T(n-1) + 1, for\ all\ integers\ n > 1$$
$$T(1) = 1$$

Please give an exact closed-form answer in terms of n, instead of a Big-Oh answer.

(Note: A useful summation formula to solve this question is $\sum_{i=0}^{n} x^i = \frac{x^{n+1}-1}{x-1}$.)

Computer Science Foundation Exam

August 25, 2018

Section II B

ALGORITHMS AND ANALYSIS TOOLS

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

Name: _____

UCFID: _____

NID: _____

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