CECS 228 Writing Assignment 5: Proofs

October 20th, 2021

Instructions

Submitting your work

Submit a single file with your solutions to the drop box by Thursday, October 21st, 8:00 pm. Make sure you provide your name and SID in the upper-right corner of your solution.

Late submissions

Should you submit after the dropbox deadline, solutions received no later than 30 minutes after the deadline will lose 20% of the earned points. Solutions received after 30 minutes but before midnight shall lose lose 50% of the earned points. All other late submissions will not be graded.

Problems

A. When proving $|x - y| \geq |x| - |y|$ via proof by cases, each case makes an assumption about x and y that allows for the removal of all the absolute-value symbols so that algebra may be used to establish the inequality. List each of the different cases and, for each one, write the resulting inequality without any absolute-value symbols. Hint: make sure your cases cover all possibilities. (10 pts)

B. Use mathematical induction to prove that 3 divides $n^3 + 2n$ for every nonnegative integer n.

   1. Show the basis step. (5 pts)

2. State the inductive assumption and what needs to be shown in the inductive step. (5 pts)
3. Complete the inductive step by showing what needs to be shown. (5 pts)