California State University, Sacramento
College of Engineering and Computer Science

Computer Science 28: Discrete Mathematics

Assignment #3 – Proof

About

Homework will be due the next class after the weekend. It should be ready to turn-in at the beginning of lecture.

If you cannot turn-in your work in class, then you may submit your homework at Riverside Hall 3018 instead, but you must time-stamp and write "Cook CSc 28" across the top of your submission.

Simple Proofs

1. Prove the following (show your work): *(10 points)*

   *If **a** is odd, **b** is odd, and **c** even then **a** × **b** × **c** is even*

2. Prove the following (show your work): *(10 points)*

   *If **a** is divisible by 2 and **b** is divisible by 5 then **a** × **b** is divisible by 10.*

Quantified Logic

1. Convert the following statement to a quantified expression, negate it, and convert the answer back to English. You will end up with the exact opposite concept. *(5 points)*

   All cats are asleep.

2. Convert the following statement into a quantified expression: *(5 points)*

   Everyone, who has seen Deadpool, likes chimichangas .

3. Simplify the following Quantified Statement. The result should have **no** negation symbols. *(15 points)*

   $\neg \forall_x \exists_x (\neg G(x) \wedge H(x))$

Induction

4. Prove the following using induction (show your work- both steps): *(15 points)*

   ***If** x ≥ 2 **then** 2 + 4 + 6 + ... + 2n = n (n + 1)*