

# CSCI 1311: Quiz 7

23 Mar 2020

Name: \_\_\_\_\_ email: \_\_\_\_\_

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## Question Weighting

|           |   |   |   |       |
|-----------|---|---|---|-------|
| Question: | 1 | 2 | 3 | Total |
| Points:   | 3 | 5 | 2 | 10    |
| Score:    |   |   |   |       |

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## Submission Instructions

- The quiz is due to Gradescope at 2:59am EDT (11:59 PM PDT)
- You can either print out the quiz and write your answers by hand, or you can write your answers separately on sheet of paper. *Do not need to type your answers.*
- You should upload pictures/scans of your answer to each question. Gradescope will direct you through this process. You can use your phone to do this. We recommend you set aside 15-20 minutes to do the uploads.
- You can learn the answer to the “Lab Question” by attending one of the lab sections.

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1. Using formal logical quantifiers, such as  $\forall$  and  $\iff$ , provide the definitions for each properties on the relation  $a R b$  where  $a$  and  $b$  are real numbers. For example, the *reflexive* property on the relation  $a R b$  is

$$(\forall a \in \mathbb{R})(a R a)$$

- (a) [1 point] The relation  $a R b$  is symmetric.

- (b) [1 point] The relation  $a R b$  is anti-symmetric.

- (c) [1 point] The relation  $a R b$  is transitive.

2. Consider the following relation:

$$(\forall a, b \in \mathbb{R})(a R b \iff b \neq 0 \wedge \frac{a}{b} \leq 1)$$

- (a) [2 points] Prove that the relation is reflexive?

- (b) [1 point] Find a counter example showing the relation is not symmetric?

- (c) [2 points] Prove that the relation is transitive?

3. [2 points] What is the answer to the "Lab Question"