

Howard University Math Department

Instructions:

PLEASE PROVIDE STEP BY STEP EXPLANATIONS

WRITING ONLY ANSWERS WILL NOT GET FULL CREDIT

Time Limit 30 minutes

Please read the questions carefully before answering

1. (a) (8 points) Show that the following is 1-1 on the nonzero real numbers
(b) (7 points) Find its inverse:

$$f(x) = \frac{1-x}{x}.$$

2. (15 points) Check whether the following relation on the set of integers is reflexive, symmetric, antisymmetric, and transitive: $xRy \iff 2 \text{ divides } x+y$.

3. (Extra credit 15 points) Given two finite sets A, B both having n elements each, prove by contrapositive: A function $f : A \rightarrow B$ is 1-1 if it is onto.