

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. (10 points) State the converse, contrapositive and negative of the following statement:

“If a natural number is even then 2 divides it.”

2. (10 points) Check the validity of the following argument. You only need to check if the conclusion follows from the first statement based on the argument. Initial statement might be assumed to be true.

“If you go to Howard then you will succeed. You didn’t succeed. So you didn’t go to Howard.”

3. (10 points) Write the following symbolic statement in words. If it is false, prove by counterexample. The domain of discourse is $\mathbb{R}$, the set of real numbers.

$$\forall x, x^2 \geq x.$$