

Math 457: Introduction to Mathematical Logic

Homework # 3

February 2, 2005

Due February 9, 2005

Exercises in writing formulas of predicate calculus.

1. Assume the following predicates:

Hx : x is a human

Cx : x is a car

Tx : x is a truck

Dxy : x drives y

Write formulas representing the obvious assumptions: no human is a car, no car is a truck, humans exist, cars exist, only humans drive, only cars and trucks are driven, etc.

2. Write formulas representing the following statements:

(a) Everybody drives a car or a truck.

(b) Some people drive both.

(c) Some people don't drive either.

(d) Nobody drives both.

3. Assume in addition the following predicate:

Ixy : x is identical to y

Write formulas representing the following statements:

(a) Every car has at most one driver.

(b) Every truck has exactly two drivers.

(c) Everybody drives exactly one vehicle (car or truck).