Homework 1

State the value of x after the statement if P(x) then x := 1 is executed, where P(x) is the statement " x> 1," if the value of x when this statement is reached is I. X is equal to zero, the condition is false. B. X= l it. X is equal to one, the condition is false. C. X= 2 iii. X is equal to two, the condition is true. So the statement x: = 1 is executed. 6. Let N(x) be the statement " x has visited North Dakota," where the domain consists of the students in your school. Express each of these quantifications in English. 3 CNN(X) I.

There exists a student in school, who has visited North Dakota. B. Vs.(x) it. All students in the school have visited North Dakota c. -13 CNN(x) iii. There does NOT exist a student in the school who has visited North Dakota d. Xx. N(X) lb. There exists a student in school, who has NOT visited North Dakota. -VS.(X) v. Not all students in the school have visited North Dakota. F. V'. All students in the school have NOT visited North Dakota. (no student has visited North Dakota) 10. Let C(x) be the statement " x has a cat," let D(x) be the statement " x has a dog," and let F(x) be the statement " x has a ferret.

Express each of these statements in terms of C(x), D(x), F(x), quantifiers, and logical connectives. Let the domain consist of all students in your class. A. A student in your class has a cat, a dog, and a ferret. B. All students in your class have a cat, a dog, or a ferret. OFF) I'. Vs.(xx) V V c. Some student in your class has a cat and a ferret, but not a dog. D. No student in your class has a cat, a dog, and a ferret. 'v. A-Xx(xx) A D(X) e. For each of the three animals, cats, dogs, and ferrets, there is a student in your class who has this animal as a pet. 1 1 . Let P(x) be the statement " x = P.

If the domain consists of the integers, what are tense trust values? VI. 0= 02, True 1= 12, True Viii. 2= 22, False 'x. False x. True, there exists a number that can be true for x= xx k. VSP(x) x'. False 14. Determine the truth value of each of these statements if the domain consists of all real numbers. I. X? I, True b. V; P) I'. X=. 5, True iii. True, - * _ 'v. False, Using negative numbers or O makes this statement false. 18. Suppose that the domain of the propositional function P(x) consists of the integer's -2, -1, O, 1, and 2. Write out each of these propositions using disjunctions, conjunctions, and negations. Vast() 22. For each of these statements find a domain for which the statement is true and a domain for which the statement is false.

Do not simply use the phrase " It is not the case that. ") a. All dogs have fleas. I. F(x): " x has fleas. " X is dog 1. VS.(X) 2. Negation: a. There exists a dog that does not have fleas. Can add. Lie. H(x): " x can had. " X is horse 3. EX.(X). 4. Negation: b. No house can read c. Every koala can climb. Iii. C(x) be " x can climb," x is koala 5. Voce. 6. Negation: c. There exists a koala that cannot climb. B. There is a horse that a No monkey can speak French. 'v. F(x) be " x can speak French," x is a monkey. 8. Negation: SF(x) 7. V x ? 1 F(x) e. There exists a pig that.