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CS-225: Discrete Structures in CS
Homework Assignment 2, Part 1
Exercise Set 3.1: Question # 16, 17, 18, 23, 24, 28 Set 3.2: Question # 2, 4

- Set 3.1 – Q#16, 17

16.a. ∀ dinosaurs x, x is extinct.
16.b. ∀ real number x, x is positive, negative, or sero.
16.c. ∀ irrational number x, x is not integers.
16.d. ∀ logician x, x is not lazy.
16.e. ∀ integer x, x^2 is not equal to the number 2,147,581,953.
16.f. ∀ real number x, x^2 is not equal to the number -1.
17.a. ∃ an exercise x such that x has an answer.
17.b. ∃ a real number x such that x is rational.

- Set 3.1 – Q#18

Let D be the set of all students at your school, and let M(s) be “s is a math major”, let C(s) be “s is a computer science student”, and let E(s) be “s is an engineering student.
a. ∃ s∈D such that E(s)∧M(s).
b. ∃ s∈D, if C(s) then E(s).
c. ∃ s∈D, if C(s) then ~E(s).
d. ∃ s∈D such that C(s) ∧ M(s).
e. (∃ s∈D such that C(s) ∧ E(s)) ∧ (∃ s∈D such that C(s) ∧ ~E(s))

- Set 3.1 – Q#23, 24

23.a. ∀ x, if x is an equilateral triangle, then x is isosceles.
∀ equilateral triangle x, x is isosceles.
b. ∀ x, if a is a computer science student, then x needs to take data structures.
∀ computer science student x, x needs to take data structures.
24.a. ∃ a hatter x such that x is mad.
∃ x such that x is a hatter and x is mad.
b. ∃ a question x such that x is easy.
∃ x such that x is a question and x is easy.

- Set 3.1 – Q#28

a. 0 is a positive real number.
b. If a real number is negative, then its opposite number is a positive real number.
c. All integers are real numbers.
d. There exits a real number that is not an integer.

Set 3.2 – Q#2
a. b. c. f.

- Set 3.2 – Q#4

a. Some dogs are not friendly.
b. Some people are not happy.
c. All suspicions were unsubstantiated.
d. No estimates are accurate.