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Computer Science

**ICS 2018 Problem Sheet #3**

Problem 3.1:

Distributive laws for sets (2+2 = 4 points)

Let A, B and C be sets. Proof that the following two distributive laws hold:

Here

Let us consider an element x such that

If

Here

Let us consider an element such that

If

Problem 3.2:

Reflexive, symmetric, transitive (1+1+1 = 3 points)

For each of the following relations, determine whether they are reflexive, symmetric, or transitive. Provide a reasoning.

(The numbers a and b are different.)

**Reflexive Property**

We have, a is equal to a.

Thus, it is not reflexive.

**Symmetric Property**

We have, .

For Example:

is True

Thus, it is symmetric.

**Transitive Property**

We have,

In some cases,

For Example:

So, is False.

Thus, it is not transitive.

(The absolute difference of the numbers a and b is less than or equal to 3.)

**Reflexive Property**

We have,

Thus, it is reflexive.

**Symmetric Property**

We have,

Thus, it is symmetric.

**Transitive Property**

We have,

May not be true

There may be conditions s.th

Thus, it is not transitive.

(The last digit of the decimal representation of the numbers a and b is the same.)

**Reflexive Property**

We have,

Thus, it is reflexive.

**Symmetric Property**

We have,

Thus, it is symmetric.

**Transitive Property**

We have,

So,

Thus, it is Transitive.