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CS-225: Discrete Structures in CS

Homework 4, Part 1

Exercise Set 6.1 of the required textbook:  Question  #6, #12, #25(a, b, c), #27 (b, c) , #33(a, c), #35(c, d)

6.  **[False] because every element of for x ∈ A is not in B**

**Starting Point**: Suppose x is a particular but arbitrarily chosen element of A.

**To Show**: Therefore, x is an element of B.

By definition of A, there is an integer a such that x=5a+2

[We must show that x=(10b-3)]

Let b=5a+2

[we must check that b is an integer]

Then b is an integer because of the definition of products and sums of integers.

Thus by definition x may be an element of B

Disprove by counterexample.

Thus 22∈A whereas 22∉ B, so

**because every element in B is an A.**

**Starting Point**: Suppose x is a particular but arbitrarily chosen element of B .

**To Show**: Therefore, x is an element of A.

By definition of B, there is an integer such that y=10b-3.

[We must show that y=5a+2]

Let a=10b-3.

Then a is an integer because of the definition of products and sums of integers.

Thus by definition y can be an element of A

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By definition y is an integer therefore

c**. B = C because**

By definition of C, z=10c+7

Let b=10c+7

Therefore

**And**

By definition y=10b-3

Let c=10b-3

Therefore

12. a. {}

b.

c.

d.

e.

f.

g. .

h.

i.

j.

25. a.

b.

c. They are not mutually disjoint because they all have the element 1 in common.

27. b. Yes it is a partition of Z because it is mutually disjoint.

c. No it is not a partition because there are common elements making then not mutually disjoint.

33. a.

c.

35. c.

d.

a,2), (b,2)}