A Book of Abstract Algebra | (2nd Edition)

Problem

Prove the following:

If $A = B$ and $B = C$, then $A = C$.

Step-by-step solution

Step 1 of 2

Objective:-

The objective is to prove $A = B \ \ and \ \ B = C, \ then \ \ A = C.$

Comment

Step 2 of 2

Proof:-

Let A and B are two sets. Let $x \in A = B$.

If sets A and B are such that every elements of A and B are same, then A and B are said to equal.

$$A = B \Leftrightarrow \{x \in A \Leftrightarrow x \in B\}$$

So,

$$x \in A \Leftrightarrow x \in B \qquad \ldots\ldots(1)$$

Let us suppose $x \in B = C.$

So,

$$x \in B \Leftrightarrow x \in C \qquad \ldots\ldots(2)$$

Let us consider the equation (1) and (2).

$$x \in B \Leftrightarrow x \in C$$

By definition:-

$$A = C$$

Proved

Comment