A Book of Abstract Algebra | (2nd Edition)

Chapter 32, Problem 3EH

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Problem

Using part 2, prove that if *h* is any automorphism of $\mathbb{R}$, $a < b$ implies $h(a) < h(b)$.

Step-by-step solution

Step 1 of 2

The objective is to prove that if h is any automorphism of $\mathbb{R}$, $a<b$ implies $h(a)<h(b)$.

Comment

Step 2 of 2

Now, $a<b$ is equivalent to $0<b-a$.

Since any automorphism of $\mathbb{R}$ takes positive numbers to positive numbers, $0<h(b-a)$.

This implies that $h(a)<h(b)$.

Comment