## Chapter 7.1, Problem 3E

### Problem

Indicate whether the statements in parts (a)-(d) are true or

false. Justify your answers.

a. If two elements in the domain of a function are equal, then their images in the co-domain are equal.

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b. If two elements in the co-domain of a function are equal, then their preimages in the domain are also equal.

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c. A function can have the same output for more than one input.

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d. A function can have the same input for more than one output.

### Step-by-step solution

**Step 1** of 3

(a)

The given statement is true.

Because different elements only have to be matched to different images.

So, functions map equal values to equal values.

**Step 2** of 3

(b)

The given statement is false.

This is not the function. Because even if the images are the same, the elements can be different to become a function. This is true if the function is one-to-one.

**Step 3** of 3

(c)

The given statement is true.

A different image can be matched to the same output, which leads to a function.

That is, different values can map to the same output but not vice-versa.

(d)

The given statement is False.

A function cannot have the same input but different outputs.