Chapter 7.1, Problem 37E

Problem

On certain computers the integer data type goes from −2, 147, 483, 648 through 2, 147, 483, 647. Let *S* be the set of all integers from −2, 147, 483, 648 through 2, 147, 483, 647. Try to define a function $f : S \to S$ by the rule $f(n) = n2$ for each n in S. Is f well defined? Why?

Step-by-step solution

Step 1 of 1

The set *S* has all integers from $-2,147,483,648$ through $2,147,483,647$.

That is $S = \{-2,147,483,648, -2,147,483,647, \cdots, 2,147,483,646, 2,147,483,647\}$

Consider the mapping $f : S \to S$ defined as $f(n) = n^2$ for every $n \in S$.

Note that $1,000,000 \in S$ and

$$\begin{aligned} f(1,000,000) &= (1,000,000)^2 \\ &= 1,000,000,000,000 \\ &\notin S \end{aligned}$$

So $f(n) \notin S$ for many values of n in S.

Thus, f is not well defined.