Chapter 7.1, Problem 36E

Problem

Let *J*4 = {0, 1, 2, 3}. Then *J*4 − {0} = {1, 2, 3}. Student *C* tries to define a function *S: J*4 − {0} → **Z** as follows: For each $x \in J4 - \{0\}$,

S(*x*) is the number *y* so that (*xy*) *mod* 4 = 1.

Student *D* claims that *S* is not well defined. Who is right: student *C* or student *D*? Justify your answer.

Step-by-step solution

Step 1 of 1

Given that $J_4 = \{0,1,2,3,4\}$

Student F is correct. Because $S(x)$ is not well defined if $S(x)$ is well defined then,

$S(x)$, For each $x \in J_4 - \{0\}$ would have a uniquely determined value

For,

Let $x = 3$

Then $S(3) = 3$ because $(3.3) \bmod 4 = 1$

And $S(3) = 7$ because $(3.7) \bmod 4 = 1$

Hence $S(3)$ does not have a uniquely determined values

Therefore *S* is not well defined