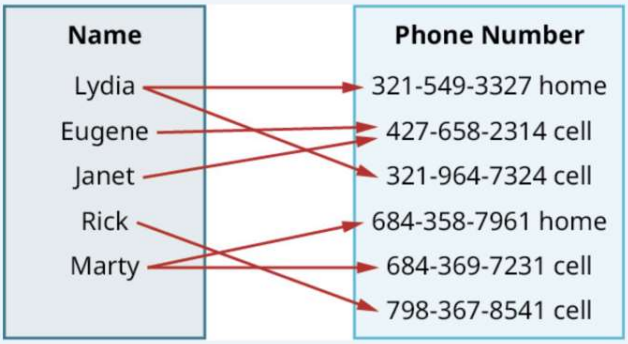
11 октября 2025 г. 17:41

W1 – HW Problems / Solutions

Determining If a Relation Is a Function with Mapping

Use the mapping in Figure 5.60 to determine whether the relation is a function.



This relation is not a function, since Lydia and Marty have 2 numbers.

Determine if each of the following equations are functions:

a. $y = x^2 + 1$

b. $y^2 = x + 1$

a) $x = 2$

$y = 2^2 + 1$

$y = 5$ ✓

b) $x = 3$

$y = \sqrt{x+1}$

$y = \sqrt{4}$

$y = \pm 2$ ✗

Which functions are surjective (i.e., onto)?

1. $f : \mathbb{Z} \to \mathbb{Z}$ defined by $f(n) = 3n$.

2. $g : \{1,2,3\} \to \{a,b,c\}$ defined by $g = \begin{pmatrix} 1 & 2 & 3 \\ c & a & a \end{pmatrix}$.

3. $h : \{1,2,3\} \to \{1,2,3\}$ defined as follows:

Which functions are injective (i.e., one-to-one)?

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3. $h : \{1,2,3\} \to \{1,2,3\}$ defined as follows: