

Homework 7

Problem 1. Let $S = \{(x, y) \in \mathbb{R} \times \mathbb{R} : y = \sqrt{4 - 2x}\}$ prove that:

1. $0 \in \text{Rng}(S)$

Proof.

□

2. $3 \notin \text{Dom}(S)$

Proof.

□

Problem 2. Let $R = \{(x, y) \in \mathbb{R} \times \mathbb{R} : x = |y|\}$, prove that:

1. $\text{Dom}(R) = [0, \infty)$

Proof.

□

2. $\text{Rng}(R) = \mathbb{R}$

Proof.

□

Problem 3. Prove that $\text{Dom}(S \circ R) \subseteq \text{Dom}(R)$

Proof.

□

Problem 4. One of these statements is true, the other is false. Prove the statement that is true and give a counter example to show the other statement is false:

1. $\text{Rng}(S) \subseteq \text{Rng}(S \circ R)$

Proof.

□

2. $\text{Rng}(S \circ R) \subseteq \text{Rng}(S)$

Proof.

□

Problem 5. Prove $(R^{-1})^{-1} = R$

Proof.

□