

Instructions

- Answer each question completely; justify your answers.
- This assignment is due at 9:00 am on November 01, 2001.

1. Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be defined by $f(x) = \sqrt{x^3 - 4x}$.
 - (a) State the domain of f .
 - (b) State the range of f .
 - (c) Prove or disprove: f is one-to-one.
 - (d) Prove or disprove: f is onto.
2. Exercise 3.1.7.
3. Exercise 3.1.25.
4. Let $A = \{0, 1, 2, \dots, 9\}$ and define the function $g : \mathcal{P}(A) \rightarrow \mathbb{Z}$ so that $g(x) = |x|$.
 - (a) What is the domain of g ?
 - (b) How many elements are in the domain of g ?
 - (c) What is the range of g ?
 - (d) Is g surjective?
 - (e) Is g injective?
5. Define $h : \mathbb{N}^2 \rightarrow \mathbb{N}$ by $h : (x, y) \mapsto (x + y)$.
 - (a) Is h surjective?
 - (b) Is h injective?
6. Exercise 3.2.4.
7. Exercise 3.2.6, except part (a).