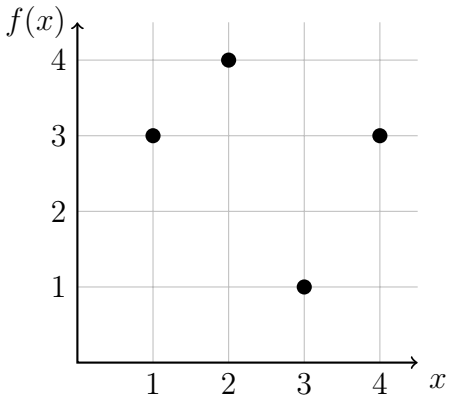
Discrete Mathematics — Tutorial Sheet 05 — Functions

BSc (H) in App Comp, Ent Sys, Comp Foren, and the IoT

Question 1

Consider the function $f : \{1, 2, 3, 4\} \to \{1, 2, 3, 4\}$ given by the graph below.



(a) Is f injective? Explain.

(b) Is f surjective? Explain.

(c) Express the function using a look-up table and a digraph.

Question 2

Consider the function $f : \{1, 2, 3, 4, 5\} \to \{1, 2, 3, 4\}$ given by the table below:

x	1	2	3	4	5
$f(x)$	3	2	4	1	2

(a) Is f injective? Explain.

(b) Is f surjective? Explain.

Question 3

Let $f : A \to B$ be some function. Suppose $5 \in B$. What can you say about $f^{-1}(5)$ if you know,

(a) f is injective? Explain.

(b) f is surjective? Explain.

(c) f is bijective? Explain.