Handout 11 CSCI 334: Spring 2022

## Partial and Total Functions: Solutions

For each of the following function definitions, you were asked to give the graph of the function and say whether it was a partial function or a total function on the integers. If the function was partial, you were asked to say where the function was defined.

1. 
$$f(x) = if x+2>3 then x*5 else x/0$$

The graph of f is

$$\{\langle x, x \times 5 \rangle \mid x > 1 \land x \in \mathbb{Z}\}$$

This is a partial function. It is defined on all integers greater than 1 and undefined on integers less than or equal to 1.

**2.** 
$$f(x) = if x<0 then 1 else  $f(x-2)$$$

The graph of f is

$$\{\langle x, 1 \rangle \mid x \in \mathbb{Z}\}$$

This is a total function.

**3**. 
$$f(x) = if x=0 then 1 else  $f(x-2)$$$

The graph of f is

$$\{\langle x, 1 \rangle \mid x \ge 0 \land x \text{ is even}\}$$

This is a partial function. It is defined on all positive even integers and undefined on all integers that are negative or odd.