

---

## Partial and Total Functions: Solutions

---

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

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

The graph of  $f$  is

$$\{\langle x, x * 5 \rangle \mid x > 1\}$$

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.  $f(x) = \text{if } x < 0 \text{ then } 1 \text{ else } f(x-2)$

The graph of  $f$  is

$$\{\langle x, 1 \rangle \mid x \text{ any integer}\}$$

This is a total function.

3.  $f(x) = \text{if } x=0 \text{ then } 1 \text{ else } f(x-2)$

The graph of  $f$  is

$$\{\langle x, 1 \rangle \mid x \geq 0 \text{ and even}\}$$

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