# 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

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

   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

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

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