## 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.

