Exercise 1

In Exercises 1 and 2, find the domains of f, g, $f+g$, and $f \cdot g$.

$$f(x) = x, \quad g(x) = \sqrt{x-1}$$

Solution

The domain of $f(x) = x$ is

$$\{x \mid -\infty < x < \infty\},$$

the domain of $g(x) = \sqrt{x-1}$ is

$$x - 1 \geq 0$$

$$x \geq 1$$

$$\{x \mid x \geq 1\},$$

the domain of $f(x) + g(x) = x + \sqrt{x-1}$ is

$$x - 1 \geq 0$$

$$x \geq 1$$

$$\{x \mid x \geq 1\},$$

and the domain of $f(x)g(x) = x\sqrt{x-1}$ is

$$x - 1 \geq 0$$

$$x \geq 1$$

$$\{x \mid x \geq 1\}.$$