Exercise 193

For the following exercises, a. find the inverse function, and b. find the domain and range of the inverse function.

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

Solution

To find the inverse function, replace x with y and replace $f(x)$ with x.

$$x = \sqrt{y - 1} \tag{1}$$

Solve for y.

$$x^2 = y - 1$$

$$y = x^2 + 1 \tag{2}$$

Notice from equation (1) that x equals a square root function, which is always greater than or equal to 0, so the domain of this inverse function is

$$\{x \mid x \geq 0\},$$

and from equation (2) the range is $\{y \mid y \geq 1\}$.