

Exercise 192

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

$$f(x) = (x - 1)^2, x \leq 1$$

Solution

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

$$x = (y - 1)^2$$

Solve for y .

$$\sqrt{x} = \sqrt{(y - 1)^2}$$

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

$$1 \pm \sqrt{x} = y$$

The negative sign is chosen because y came from x that satisfies $x \leq 1$.

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

The domain of this inverse function is

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

and the range is $\{y \mid y \leq 1\}$.