Exercise 10

For the following exercises, determine whether the relation represents y as a function of x.

$$x = y^2$$

Solution

Solve the equation for y, the output, by taking the square root of both sides.

$$\sqrt{x} = \sqrt{y^2}$$

Since there's an even power under an even root, and the result is to an odd power (y^1), an absolute value sign is needed.

$$\sqrt{x} = |y|$$

Remove the absolute value sign by placing $\pm$ on the left side.

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

The relation $x = y^2$ is not a function because for every input x, there are two outputs given by $y = \sqrt{x}$ and $y = -\sqrt{x}$. This is reflected in the graph by the fact that there are vertical lines that pass through the curve more than once.