

Exercise 12

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

$$2x + y^2 = 6$$

Solution

Solve the equation for y , the output. Subtract both sides by $2x$.

$$y^2 = 6 - 2x$$

Take the square root of both sides.

$$\sqrt{y^2} = \sqrt{6 - 2x}$$

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.

$$|y| = \sqrt{6 - 2x}$$

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

$$y = \pm\sqrt{6 - 2x}$$

The relation $2x + y^2 = 6$ is not a function because for every x input, there are two outputs given by $y = \sqrt{6 - 2x}$ and $y = -\sqrt{6 - 2x}$. This is reflected in the graph by the fact that there are vertical lines that pass through the curve more than once.

