Exercise 73

For a curve to be *symmetric about the x-axis*, the point (x, y), must lie on the curve if and only if the point $(x, -y)$, lies on the curve. Explain why a curve that is symmetric about the x-axis is not the graph of a function, unless the function is $y = 0$.

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Solution

When an input x has two outputs, y and $-y$, the relation is not a function. Only if

$$y = -y$$

$$2y = 0$$

$$y = 0$$

is the relation a function because there will only be one output.