

Exercise 15

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

$$x = \frac{3y + 5}{7y - 1}$$

Solution

Try to solve the given equation for y . Start by multiplying both sides by $7y - 1$.

$$x(7y - 1) = 3y + 5$$

Expand the left side.

$$7xy - x = 3y + 5$$

Bring the terms with y to the left, and bring the terms with x to the right.

$$7xy - 3y = x + 5$$

Factor y on the left.

$$y(7x - 3) = x + 5$$

Divide both sides by $7x - 3$.

$$y = \frac{x + 5}{7x - 3}$$

The relation $x = (3y + 5)/(7y - 1)$ is a function because for every input x , there's exactly one output given by $y = (x + 5)/(7x - 3)$. This is reflected in the graph by the fact that any vertical line passes through the curve exactly once.

