Exercise 310

True or False? Justify your answer with a proof or a counterexample.

A function is always one-to-one.

Solution

This is false because a function can have the same output for two or more inputs. Consider, for example,

$$f(x) = x^2.$$

Plugging in $x = -2$ or $x = 2$ gives $y = 4$, so this function is not one-to-one.