Who Cares if a Rule is a Relation or Function?

A good reason to know if a rule is a function is that some rules we can apply operations, like adding, subtracting, and other rules we cannot.

A rule that is a function will allow us to combine functions. Other rules that are just relations will not provide us that opportunity.

Looking at another rule might give us a clue, $x^2 + y^2 = 25.$

Solving that for that y, we get $y^2 = 25 - x^2$

$$y = \pm\sqrt{25 - x^2}$$

Now if we substitute a number like 3 in for x, we get two answers, (3, 4) and (3, –4). You can see there is **not one and only one** member in the range for each member in the domain. Therefore this rule describes a relation that is not a function.