



## Why

1

### Definition

A *real rational function* (or *rational function* or *fractional function*) is a function  $f : \mathbf{R} \rightarrow \mathbf{R}$  for which there exists polynomials  $p : \mathbf{R} \rightarrow \mathbf{R}$  and  $q : \mathbf{R} \rightarrow \mathbf{R}$  so that  $f(x) = p(x)/q(x)$  for all  $x \in \mathbf{R}$ .

In this case we call  $p$  the *numerator polynomial* (and  $p$  the *numerator function*) and  $q$  the *denominator polynomial* (and  $q$  the *denominator function*). Of course, the language *rational* is in reference to the fact that if  $p$  and  $q$  are integer-valued functions, then the function  $f$  is a rational-valued function (see Rational Numbers).

---

<sup>1</sup>Future editions will include.



