

# Domains of rational expressions

[Science](#), [Mathematics](#)



Week Discussion The two rational expressions of which to base my work are given below: and The domain is all the values that go into a function (or an expression). However, it is possible that some values will not be allowed in a rational expression depending upon the denominator of the rational expression and they are called Excluded value (s) for the rational expression.

In Real number system, division by zero is not defined. Therefore, the rational expression cannot have a denominator value equal to zero because it will make the number (numerator) division by zero.

The first rational expression is  $\frac{m}{m-7}$ . Here the numerator is divided by the denominator  $m-7$ . Therefore, the value of  $m$  ( $7$  is a constant) cannot be zero and  $m = 7$  is an excluded value for the domain. Thus, the domain (D) of the first rational expression is the set of all Real numbers excluding  $7$ . In set notation, this can be written as

$$D = \{x \in \mathbb{R} \mid x \neq 7\}$$

The second rational expression is  $\frac{x^2-4}{x^2-5x+6}$ . Here the numerator is divided by the denominator  $x^2-5x+6$ . Therefore, the value of  $x$  cannot be zero. To find out the excluded value(s) of the rational expression, we need to factor out the denominator of the expression.

It is a difference of squares that we need to factor.

Setting each factor equal to 0.

or Adding/subtracting 2 from both sides.

or Dividing both sides by 5.

or These are the excluded values for the rational expression.

Thus, the domain (D) of the second rational expression is the set of all Real

numbers excluding  $\pm 2/5$ . In set notation, this can be written as

D =

Yes, both of my rational expressions have excluded values in their domains.

For the first expression, the excluded value is 0. This is excluded from the domain because it will make denominator value 0, which is undefined in the Real number system. For the second expression, the excluded values are  $\pm 2/5$ . These are excluded from the domain because it will make denominator value 0, which is undefined in the Real number system.