**6.1 – Rational Expressions**

Definition :   
A **Rational Expression** is an algebraic expression than can be written as a fraction of polynomials.

Ex : ; …

When dealing with rational expressions, we need to determine its **domain**, i.e. determining the values of *x* where the expression exists. The expression won’t exist for values of *x* where leading to a denominator that equals 0.

Examples : a) This expression doesn’t exist if

Restrictions:

Domain : or

b)

Restrictions:

and

and

Domain : or

c)

Restrictions :

By factoring or using the quadratic formula, we get :

and

Domain: ou

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If there is a common factor on the numerator and the denominator of a rational expression, you can **simplify** it. You’ll get an **equivalent** expression, but it won’t necessarily have the same domain. We often say they are equal, but technically they aren’t for all values of *x*…

Examples : and are equivalent. with and

i.e. and are equivalent.

Remember that a Rational Expression can only be **simplified** if it is **FACTORED**.

And you need to determine the **restrictions** on the variable **before simplifying** it.

Example 1 :

Restrictions :

Simplification :

Example 2 :

Restrictions :

Simplification :

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