

Unit 7: Rational Expressions & Equations

7.1 Rational Expressions

Rational Expression:

An expression of the form $f(x) = \frac{g(x)}{h(x)}$ where $g(x)$ and $h(x)$ are polynomial

Ex. $\frac{1}{x}$; $\frac{m}{m+1}$; $\frac{y^2-1}{y^2+2y+1}$; $x^2 - 4$

Non-Permissible Value:

Any value(s) of a variable(s) that makes an expression undefined.

- In rational expressions a value that leads to a **denominator** of 0 (cannot divide by zero)

ex. State the non-permissible values for each rational expression.

a) $\frac{5z}{x^2y}$

b) $\frac{3x+2}{5}$

c) $\frac{4x^2}{3(2x+1)}$

d) $\frac{a-2}{a^2-7a+10}$

e) $\frac{7z}{z^2+1}$

Like fractions we can simplify rational expressions by cancelling common factors from all terms in the numerator and denominator. To do this we need to factor.

ex. Simplify. State any non-permissible values.

a) $\frac{9}{15}$

b) $\frac{a^3b}{a^4b^2}$

c) $\frac{12x^2y}{-24x^2z^3}$

d) $\frac{4}{2x-3}$

e) $\frac{3x-6}{2x^2+x-10}$

f) $\frac{1-x}{x^2-1}$

g) $\frac{2x^2-3x-2}{x^2+5x-14}$

h) $\frac{2m-6}{9-m^2}$

ex. Given the expression $\frac{16x^2-9y^2}{8x-6y}$

a) What expression represents the non-permissible values for x .

b) Simplify.

c) Evaluate for $x = 2.6$ and $y = 1.2$



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