

Math 10 Honours – PC Math 11 Preview: Simplifying Rational Expressions

how zero
affects
division

A rational expression is:

Evaluate $\frac{0}{3}$

When zero is divided by any non-zero real number, ...

Evaluate $\frac{7}{0}$

Division by zero is undefined because...

undefined
values

For the expression $\frac{3}{x-2}$, what value for x is undefined?

What is an **undefined value**?

Write a rule that explains how to determine undefined values:

Example 1 - Determine the undefined values for each rational expression

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

b) $\frac{x-1}{(x+2)(x-3)}$

c) $\frac{2y^2}{y^2-4}$

simplifying
rational
expressions

When simplifying rational expressions:

1)

2)

Example 2 - Simplify the rational expressions. Keep a running list of undefined values.

a) $\frac{3x-3}{6x-6}$

b) $\frac{x-2}{x^2-4}$

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

d) $\frac{2y^2+y-10}{y^2+3y-10}$

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

f) $\frac{x^2y+xy^2}{xy+y^2}$

Example 3 - Simplify

a) $\left(\frac{4x^2}{3xy}\right)\left(\frac{y^2}{8x}\right)$

b) $\left(\frac{d}{2\pi r}\right)\left(\frac{2\pi rh}{d-2}\right)$

c) $\frac{y^2-9}{r^3-r} \times \frac{r^2-r}{y+3}$

d) $\left(\frac{x^2-x-12}{x^2-9}\right)\left(\frac{x^2-4x+3}{x^2-4x}\right)$