

Rational Expressions and Equations Lesson #2: Simplifying Rational Expressions - Part Two

In this lesson, we extend the method of simplifying rational expression to more complex examples.

Recall that when we divide by an expression containing a variable, there are restrictions on the value which can be replaced for the variable. These are called nonpermissible values of the variable.

Recall also that reducing rational expressions involves **cancelling factors** but **not terms**.

Class Ex. #1



Reduce to lowest terms, stating the restrictions on the variable.

a) $\frac{4t^3 - 9t}{2t^2 - 3t}$

$$\frac{t(4t^2 - 9)}{t(2t - 3)}$$

$$\frac{t(2t+3)(2t-3)}{t(2t-3)}$$

$t \neq 0, \frac{3}{2}$

$2t + 3$

b) $\frac{2x^2 + 5x - 3}{2x^2 + x - 1}$

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

$x \neq -1, \frac{1}{2}$

$\frac{x+3}{x+1}$

c) $\frac{a^2 + 2a - 8}{a^4 - 20a^2 + 64}$

$$\frac{(a+4)(a-2)}{(a^2-16)(a^2-4)}$$

$$\frac{(a+4)(a-2)}{(a-4)(a+4)(a-2)(a+2)}$$

$a \neq \pm 2, \pm 4$

$\frac{1}{(a-4)(a+2)}$

Class Ex. #2



Express in simplest form, stating the values of the variable for which the expression is not defined.

a) $\frac{c-4}{4-c}$

$$\frac{c-4}{-1(c-4)}$$

$c \neq 4$

-1

b) $\frac{2p^3 - 4p^2}{16 - 8p}$

$$\frac{2p^2(p-2)}{8(2-p)}$$

$$\frac{2p^2(p-2)}{-8(p-2)}$$

$p \neq 2$

$\frac{p^2}{-4}$

c) $\frac{1 - 4x^2}{6x^2 - 5x - 4}$

$$\frac{(1+2x)(1-2x)}{6x^2 - 8x + 3x - 4}$$

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

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

$x \neq -\frac{1}{2}, \frac{4}{3}$

$\frac{1-2x}{3x-4}$

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#1-4, 6 (a, c, e...)