

Simplifying Rational Expressions

Multiplying and Dividing Rational Expressions

Example 1:

State the excluded value of x for each rational expression.

denominator $\neq 0$
cannot divide 0

a. $\frac{x+2}{3x}$ $\frac{1}{3}x \neq \frac{0}{3}$ $x \neq 0$

b. $\frac{4x}{(x+5)}$ $x + \frac{5}{-5} \neq \frac{0}{-5}$ $x \neq -5$

c. $\frac{x+3}{x^2+4x-12}$ $x^2 + 4x - 12 \neq 0$

$(x+6)(x-2) \neq 0$

$x \neq -6$ $x \neq 2$

Example 2:

Simplify.

$\frac{5}{5x} = \frac{1}{x}$

a. $\frac{1 \cancel{5}(3-x)}{1 \cancel{5}x} = \frac{(3-x)}{x}$

b. $\frac{2 \cdot x \cdot \cancel{x}}{2x^2} = \frac{2x}{(x+5)}$

c. $\frac{5x+3}{x+3}$ Simplified!

d. $\frac{5x+15}{x+3} = \frac{5(\cancel{x+3})}{(\cancel{x+3})} = 5$

Example 3:

Simplify.

a. $\frac{15x}{5-10x} = \frac{\overset{3}{\cancel{15}}x}{\cancel{5}(1-2x)} = \frac{3x}{(1-2x)}$

c. $\frac{2r-4}{r-2} = \frac{2(\cancel{r-2})}{(\cancel{r-2})} = 2$

b. $\frac{x^2 + \overset{+}{6}x + \overset{+}{9}}{x^2 - 9} = \frac{(x+3)(x+3)}{(x+3)(x-3)} = \frac{x+3}{x-3}$

d. $\frac{x+6}{x^2 + \overset{+}{5}x - 6} = \frac{(\cancel{x+6})}{(\cancel{x+6})(x-1)} = \frac{1}{(x-1)}$

e. $\frac{\overset{4}{16}p^3}{28p} = \frac{4p}{7}$