

Name:

Date:

Period:

7.1 Simplifying Rational Expressions

Warm up

1. Simplify:

$$\frac{\cancel{2}^1}{\cancel{2}^1 \cdot 2 \cdot 2} = \frac{1}{4}$$

2. Simplify:

$$\frac{\cancel{16}^1 x}{\cancel{16}^1 x} = 1$$

Why can't x be equal to zero?

If $x = 0$, then the denominator would equal 0. The fraction would be undefined.

3. Simplify:

$$\frac{\cancel{x-3}^1}{\cancel{x-3}^1} = 1$$

Why can't x be 3?

The denominator would equal 0 and the fraction would be undefined.

4. Is the statement T or F? $\frac{x+3}{x} = 3$

F

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

Why or why not?

x in the numerator is not a factor. $(x+3)$ is the factor.

Rational
Expressions

Rational Expression: A rational expression is a

ratio or fraction of two polynomial expressions.

Simplifying Rational Expressions

- Factor BOTH the numerator and denominator.
- Determine EXCLUDED VALUES: The value of the variable that makes the denominator equal 0.
- Simplify monomials using the exponent rules
- Simplify to 1 when there is a common binomial factor in both the numerator and denominator.

Directions: Simplify the following rational expressions and determine the excluded values.

1. $\frac{10x^5}{14x^2}$

$\frac{10x^3}{7}$ $x \neq 0$

*excluded values need to be determined before simplifying.

2. $\frac{6k-36}{k-6}$

$\frac{6(k-6)}{k-6}$

$k \neq 6$

3. $\frac{y+8}{y^2+2y-48}$

$\frac{y+8}{(y+8)(y-6)}$

$\frac{1}{y-6}$ $y \neq -8, 6$

4. $\frac{2r^2-2r-40}{8r+32}$

$\frac{2(r^2-r-20)}{8(r+4)}$

$\frac{2(r-5)(r+4)}{8(r+4)}$

$\frac{r-5}{4}$ $r \neq -4$

5. $\frac{p^2-49}{7-p}$

$\frac{(p-7)(p+7)}{-1(p-7)}$

$-(p+7)$ or $-p-7$
 $p \neq 7$

6. $\frac{45-5w}{3w^2-28w+9}$

$\frac{5(9-w)}{(3w-1)(w-9)} \rightarrow \frac{-5(w-9)}{(3w-1)(w-9)}$

$\frac{-5}{3w-1}$ $w \neq \frac{1}{3}, 9$