



rational expressions

denominator restrictions numerator

Rational Expression
 Numerator → Polynomial
 Denominator → Polynomial
 7x+14

Ex.) Simplify each expression.

a) $\frac{5n^4}{-2} \cdot \frac{(5n)^2}{6}$ $n \neq 0$

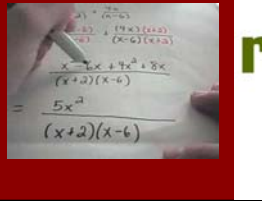
$= \frac{1\cancel{5}n^{\cancel{4}2} \cdot \cancel{6}3}{-1\cancel{2} \cdot 5\cancel{2}5\cancel{2}}$

$= \boxed{\frac{3n^2}{-5}}$

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

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

$= \boxed{\frac{(x-2)}{6}}$ $x \neq 0, -1, 2.$



rational expressions

denominator restrictions numerator

Rational Expression
 Numerator → Polynomial
 Denominator → Polynomial
 7x+14

a) $\frac{x^2+5x+4}{2x^2-8x+8} \cdot \frac{4x-8}{x^2-1}$

$= \frac{(x+4)(x+1)}{\cancel{2}(x-2)(x-2)} \cdot \frac{2\cancel{4}(x-2)}{(x+1)(x-1)}$

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

$x \neq \pm 1, 2$


b) $\frac{4x-10}{x+3} \div \frac{3(4x^2-20x+25)}{12x^2-60x+75}$


$= \frac{2(2x-5)}{(x+3)} \cdot \frac{3(2x-5)(2x-5)}{2(x+3)(x-3)}$

$= \frac{2(2x-5)}{(x+3)} \cdot \frac{2(x+3)(x-3)}{3(2x-5)(2x-5)}$

$= \boxed{\frac{4(x-3)}{3(2x-5)}}$

$x \neq \pm 3, \frac{5}{2}$





Rational Expression
 Numerator → Polynomial
 Denominator → Polynomial
 7x+14

a) $\frac{7n^3}{4} \div \frac{(7n)^2}{-12}$


$= \frac{7n^3}{4} \cdot \frac{-12}{7 \cdot 4n^2}$


$= \boxed{\frac{-3n}{7}} \quad n \neq 0$

b) $\frac{5(x-3)}{2x} \div \frac{10(x-3)}{3x(x+5)}$

$= \frac{\cancel{5}(x-\cancel{3})}{2x} \cdot \frac{3x(x+5)}{2 \cdot 10 \cancel{(x-3)}}$

$= \boxed{\frac{3(x+5)}{4}} \quad x \neq -5, 0, 3$





Rational Expression
 Numerator → Polynomial
 Denominator → Polynomial
 7x+14

Ex.) Simplify rational expressions that involve two or more operations: Use BEDMAS rules!

a) $\frac{x+3}{x^2-2x-15} \cdot \frac{2x-10}{2x^2+15x+7} \div \frac{2x-4}{x^2+5x-14}$

$= \frac{\cancel{(x+3)}}{\cancel{(x-5)}\cancel{(x+3)}} \cdot \frac{\cancel{2}(x-\cancel{5})}{\cancel{(x+7)}(2x+1)} \cdot \frac{\cancel{(x+7)}\cancel{(x-2)}}{\cancel{2}(x-2)}$

$= \boxed{\frac{1}{(2x+1)}}$

$x \neq -7, -3, -\frac{1}{2}, 2, 5.$





Rational Expression

Numerator → Polynomial

Denominator → Polynomial

7x+14

Identify & Correct Any Errors

b) $\frac{-2ab^2}{5a^3b} \div \frac{-4a}{15ab}$

~~$= \frac{2ab^2}{5a^3b} \cdot \frac{15ab}{2 \cdot 4a}$~~

$= \frac{6a}{b^2} \cdot \frac{3b^2}{2a^2}$

$a \neq 0$
 $b \neq 0$

b) $\frac{15(x+5)}{2x^2} \cdot \frac{8x}{5(x+5)^2}$

~~$b) \frac{3 \cdot 15(x+5)}{2x^2} \cdot \frac{4 \cdot 8x}{5(x+5)(x+5)}$~~

$= \frac{12x}{(x+5)} \cdot \frac{12}{x(x+5)}$

$x \neq -5, 0$





Rational Expression

Numerator → Polynomial

Denominator → Polynomial

7x+14

Pg. 327 # 1-9.