12-4 Dividing Rational Expressions

Type 1 – All Numerators and Denominators are Monomials

1. $\frac{16}{x^7} \div \frac{4}{x^4} =$

$\frac{16}{x^7} \cdot \frac{x^4}{4} = \frac{16x^4}{4x^7} = \frac{4}{x^3}$

2. $\frac{5x^3}{y} \div \frac{6x^4}{3y^2} =$

$\frac{5x^3}{y} \cdot \frac{3y^2}{6x^4} = \frac{15x^3y^2}{6x^4y} = \frac{5y}{2x}$

To Divide Fractions we will instead **Multiply by the Reciprocal** of the second fraction:

1. Flip 2nd Fraction
2. Change operation to $\cdot$

Type 2 – Numerators and Denominators are Polynomials

3. $\frac{a^2+7a+10}{a-6} \div \frac{a+5}{a^2-36} =$

$\frac{a^2+7a+10}{a-6} \cdot \frac{a^2-36}{a+5} = \frac{(a+5)(a+2)}{(a-6)} \cdot \frac{(a-6)(a+6)}{(a+5)} = (a+2)(a+6)$

4. $\frac{2x^2+12x+16}{x^2+x-2} \div \frac{2x+8}{x+2} =$

$2(x^2+6x+8)$ (1,8; 2,4)

$\frac{2x^2+12x+16}{x^2+x-2} \cdot \frac{x+2}{2x+8} = \frac{2(x+2)(x+4)}{(x+2)(x-1)} \cdot \frac{(x+2)}{2(x+4)} = \frac{(x+2)}{(x-1)}$

Type 3 – A Polynomial divided by a Monomial

5. $\frac{9c^4+6c^3-3c^2}{3c^2} =$

$3c^2+2c-1$

6. $\frac{-7t^5+14t^4-28t^3+35t^2}{7t} =$

$-1t^4+2t^3-4t^2+5t$

Practice 12-4 Name _____

Divide. Make sure your answer is expressed in simplest form.

1. $\frac{2x}{3} \div \frac{5}{6x^3} =$

2. $\frac{10c^2}{3cd} \div \frac{5cd}{9d^5} =$

3. $\frac{3t+12}{5t} \div \frac{3t^2-48}{10t} =$

4. $\frac{x+5}{x^2-9x+14} \div \frac{x^2+7x+10}{x^2-4} =$

5. $\frac{6x^2-4x^3+8x^4}{2x} =$

6. $\frac{6x^3-24x^4}{6x^3} =$