

2-5 HW Answer Key

1. 1 2. 6

3. $\frac{3}{2}$ 4. $-y$ 5. $\frac{3}{4(x+1)}$

6. $\frac{3(x+2)}{2x^2}$

7. $\frac{3(x-4)}{2x}$

8. $\frac{5x}{x^2+13x+42} = \frac{5x}{(x+6)(x+7)}$

Alg 2 Homework 2-5

Name Key (2016)Solve the following equations.

$$1. \frac{3(x-2)}{x-2} - \frac{4x}{3x-6} = \frac{1}{3} \quad 3(x-2)$$

$$12x - 13 = x - 2$$

$$11x = 11$$

$$x = 1$$

{1}

$$2. \frac{x}{2x+8} + \frac{1}{x-4} = \frac{16}{x^2-16}$$

$$x(x-4) + 2(x+4) = 32$$

$$x^2 - 4x + 2x + 8 = 32$$

$$x^2 - 2x - 24 = 0$$

$$(x-6)(x+4) = 0$$

$$x = 6 \quad | \quad x = -4 \text{ reject}$$

{6}

Simplify the following fractions.

$$3. \frac{\frac{x}{3} \left(\frac{9}{9} \right)}{\frac{2x}{9} \left(\frac{9}{9} \right)} = \frac{3x}{2x} = \left(\frac{3}{2} \right)$$

$$\frac{\left(\frac{8y}{8} \right) \left(1 - \frac{y}{8} \right) \left(\frac{8y}{8} \right)}{\left(\frac{8y}{8} \right) \left(\frac{1}{8} - \frac{1}{y} \right) \left(\frac{8y}{8} \right)} = \frac{8y - y^2}{y - 8} = \frac{y(8-y)}{y-8} = -y$$

$$\begin{aligned}
 5. \frac{x}{x+1} (3x+1) &= \frac{3x}{3x(x+1) + x(x+1)} \\
 &= \frac{3x}{3x^2 + 3x + x^2 + x} \\
 &= \frac{3x}{4x^2 + 4x} = \frac{3}{4x+4}
 \end{aligned}$$

$$\begin{aligned}
 6. \frac{\frac{2}{x} + \frac{1}{x+2}}{\frac{2x}{x+2}} &= \frac{2(x+2) + x+2}{2x^2} = \frac{2x+4+x+2}{2x^2} \\
 &= \frac{3x+6}{2x^2}
 \end{aligned}$$

$$\begin{aligned}
 7. \frac{\frac{3}{2x(x-4)}}{\frac{1}{x-4}} &= \frac{3(x-4)}{2x}
 \end{aligned}$$

$$\begin{aligned}
 8. \frac{\frac{5}{x+6}}{\frac{7}{x} + 1} x(x+6) &= \frac{5x}{7x+42 + x^2+6x} \\
 &= \frac{5x}{x^2+13x+42}
 \end{aligned}$$

Rational Expressions

Algebra 2 Unit 2 Day 6

Multiplying Rational Expressions

- Factor** all numerators and denominators (only if + or - signs)
- Divide out common factors
- Look for a factor of -1
- Write as a single fraction

Simplify before you multiply!

Multiply. Assume that all expressions are defined.

$$1. \frac{2x^2y^3}{3x^2} \cdot \frac{5x^2}{8xy^2} = \frac{5xy^3}{4}$$

$$2. \frac{x+2}{3x+12} \cdot \frac{x+4}{x^2-4} = \frac{\cancel{x+2}}{3(\cancel{x+4})} \cdot \frac{\cancel{x+4}}{(x-2)(\cancel{x+2})} = \frac{1}{3(x-2)}$$

$$3. \quad \frac{4x+16}{2x+6} \cdot \frac{x^2+2x-3}{x+4}$$

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

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

$$\boxed{2(x-1)}$$

$$4. \quad \frac{2x-4}{x+1} \cdot \frac{3x+3}{4-x^2}$$

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

$$\boxed{\frac{-6}{2+x}}$$

Dividing Rational Expressions

Change to multiplication by the reciprocal, then follow rules for multiplying.

$$\text{Rule: } \frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc}$$

Multiply or divide. Assume all expressions are defined.

$$1. \quad \frac{y^2 - 16}{2y + 6} \cdot \frac{y + 3}{y + 4}$$

$$\frac{(y-4)(y+4)}{2(y+3)} \cdot \frac{y+3}{y+4}$$

$$\boxed{\frac{y-4}{2}}$$

$$2. \quad \frac{4x^3}{9x^2y} \div \frac{16}{9y^5} = \frac{\cancel{4}x^{\cancel{3}}}{9\cancel{x}^2y} \cdot \frac{9y^{\cancel{5}}}{\cancel{16}} \cdot \frac{y^4}{4}$$

$$= \boxed{\frac{xy^4}{4}}$$

$$3. \quad \frac{x^2 - 2x - 8}{9x^2 - 16} \cdot \frac{3x^2 + 10x + 8}{x^2 - 16}$$

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

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

$$\begin{array}{r} 3x^2 + 10x + 8 \\ \underline{3x^2 + 6x + 4x + 8} \\ 3x(x+2) + 4(x+2) \\ (x+2)(3x+4) \end{array}$$

$$\begin{array}{l} p=24 \\ s=10 \\ 6,4 \end{array}$$

$$4. \quad \frac{x^2 - 4}{2x - 6} \div \frac{2 - x}{x - 3}$$

$$\frac{x^2 - 4}{2x - 6} \cdot \frac{x - 3}{2 - x}$$

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

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

$$5. \quad \frac{6x^2 - 7x + 2}{5x} \cdot \frac{10x}{4x - 2}$$

$$6. \quad \frac{x^2 - 6x + 9}{9 - x^2} \cdot \frac{4x^2 - 4x + 1}{2x^2 - 7x + 3}$$

$$7. \frac{x^5 - 4x^3}{x^2 + x - 2} \cdot \frac{x^5 - x^4 - 2x^3}{x^2 - 1}$$

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

$$\frac{x^6 (x-2)^2}{(x-1)^2}$$

$$8. \frac{x^2 - 5x + 6}{x + 4} \div \frac{x^2 - 9}{x^2 + 5x + 4}$$

$$\frac{x^2 - 5x + 6}{x + 4} \cdot \frac{x^2 + 5x + 4}{x^2 - 9}$$

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

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

Discuss with partner and write a response:

- a) Describe the process for multiplying rational expressions.

- b) Describe the process for dividing rational expressions.

Castle Learning Extra Credit
Due: Thurs 10/11