

GO for Help

For practice in dividing fractions, go to p. 883.

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To divide rational expressions, remember to multiply by the reciprocal of the divisor, just as you did when dividing rational numbers.

4 EXAMPLE Dividing Rational Expressions

Divide $\frac{4-x}{(3x+2)(x-2)}$ by $\frac{5(x-4)}{(x-2)(7y-5)}$. State any restrictions on the variables.

$$\begin{aligned} & \frac{4-x}{(3x+2)(x-2)} \div \frac{5(x-4)}{(x-2)(7y-5)} && \text{Multiply by the reciprocal.} \\ & = \frac{4-x}{(3x+2)(x-2)} \cdot \frac{(x-2)(7y-5)}{5(x-4)} && \text{Divide out common factors.} \\ & = \frac{-\cancel{(x-4)}}{(3x+2)\cancel{(x-2)}} \cdot \frac{\cancel{(x-2)}(7y-5)}{5\cancel{(x-4)}} && \text{Rewrite the expression.} \\ & = \frac{-1}{3x+2} \cdot \frac{7y-5}{5} && \text{Multiply.} \\ & = \frac{-(7y-5)}{5(3x+2)} \end{aligned}$$

The quotient is $\frac{-(7y-5)}{5(3x+2)}$ for $x \neq -\frac{2}{3}, 2$, or 4 , and $y \neq \frac{5}{7}$.

CA Standards Check 4 Divide $\frac{a^2+2a-15}{a^2-16}$ by $\frac{a+1}{3a-12}$. State any restrictions on the variable.

EXERCISES

For more exercises, see *Extra Skill and Word Problem Practice*.

Standards Practice

ALG2 7.0

A Practice by Example

Examples 1 and 2
(pages 517–518)

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Example 3
(page 518)

Example 4
(page 519)

Simplify each rational expression. State any restrictions on the variable.

- $\frac{2x}{4x^2-2x}$
- $\frac{6c^2+9c}{3c}$
- $\frac{a^2b^3}{a^{-1}b^2}$
- $\frac{z^2-49}{z+7}$
- $\frac{2x+10}{4x^{-2}}$
- $\frac{x^2+8x+16}{x^2-2x-24}$

Multiply. State any restrictions on the variables.

- $\frac{4x^2}{5y} \cdot \frac{7y}{12x^4}$
- $\frac{2x^4}{10y^{-2}} \cdot \frac{5y^3}{4x^3}$
- $\frac{8y-4}{10y-5} \cdot \frac{5y-15}{3y-9}$
- $\frac{2x+12}{3x-9} \cdot \frac{2x-6}{3x+8}$
- $\frac{x^2-4}{x^2-1} \cdot \frac{x+1}{x^2+2x}$
- $\frac{x^2-5x+6}{x^2-4} \cdot \frac{x^2+3x+2}{x^2-2x-3}$

Divide. State any restrictions on the variables.

- $\frac{7x}{4y^3} \div \frac{21x^3}{8y}$
- $\frac{3x^3}{5y^2} \div \frac{6y^{-3}}{5x^{-5}}$
- $\frac{6x+6y}{x-y} \div \frac{18}{5x-5y}$
- $\frac{3y-12}{2y+4} \div \frac{6y-24}{4y+8}$
- $\frac{x^2}{x^2+2x+1} \div \frac{3x}{x^2-1}$
- $\frac{y^2-5y+6}{y^3} \div \frac{y^2+3y-10}{4y^2}$