

Assignment

Write

In your own words, explain how operating with rational expressions is similar to operating with rational numbers. Use examples to illustrate your reasoning.

Remember

The process for adding and subtracting rational expressions is similar to the process for adding and subtracting rational numbers, and the process for multiplying and dividing rational expressions is similar to the process for multiplying and dividing rational numbers.

Practice

1. Add or subtract each expression. List any restrictions on the variables.

a. $\frac{3y}{4} - \frac{x}{3} + \frac{5y}{6}$


b. $\frac{2}{2x-4} - \frac{5}{x^2-4}$

c. $\frac{60-3x}{x^2+x-20} + \frac{3x+9}{x+3}$

d. $\frac{2}{2x^2+7x+3} - \frac{x}{x^2-2x-15} + 1$

2. Alicia multiplied $\frac{3x-6}{8x-16} \cdot \frac{4x}{9}$. Her work is shown.

Alicia


$$\begin{aligned}\frac{3x-6}{8x-16} \cdot \frac{4x}{9} &= \frac{\cancel{3}x-6}{\cancel{8}x-16} \cdot \frac{4x}{\cancel{9}} \\ &= \frac{x-6}{-14} \cdot \frac{1}{3} \\ &= \frac{x-6}{-42}, x \neq 2\end{aligned}$$

Identify the error(s) in Alicia's work. Then correctly perform the multiplication.

3. Multiply or divide each. List any restrictions on the variables.

a. $\frac{2x^2-32}{x^2-10x+24} \cdot \frac{x^2-4x-12}{10x+20}$

b. $\frac{6x}{x-9} \cdot \frac{x^2-10x+9}{2x+12} \cdot \frac{x+6}{x^4+x^3-2x^2}$

c. $\frac{8a^3b}{5c} \div \frac{10ab^2}{3c}$

d. $\frac{14x^2}{4x+20} \div \frac{7x^2-21x}{x^2-25}$

e. $\frac{xy^2-6y^2}{2x+18} \div \frac{2xy+y}{8x+24} \div \frac{x^2-3x-18}{2x^2-3x-2}$

Stretch

1. Perform the operations.

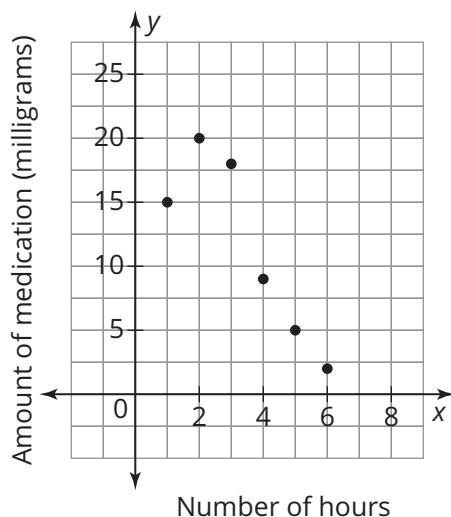
$$\frac{12x}{3x^2 - 10x + 3} - \frac{x - 2}{x^2 - 9} + 2$$

Review

1. Consider the rational function $\frac{x + 1}{x^2 - 4x - 5}$. Determine any vertical and horizontal asymptotes and any removable discontinuities of the graph of $f(x)$. Explain your reasoning.
2. Write a function $f(x)$ with a vertical asymptote $x = -2$ and removable discontinuities at $x = 1$ and $x = -4$. Explain your reasoning. Explain how to sketch the graph of the function $g(x)$ without using technology.
3. Determine the domain points of discontinuity for the rational function. Explain your reasoning.

$$f(x) = \frac{x^2 + 5x + 4}{x^3 + 64}$$

4. Data is collected to determine levels of a medication in a patient's bloodstream. The level of medication in milligrams, y , in a patient's bloodstream x hours after the medication is taken can be modeled by the equation $y = 0.03x^4 + 0.41x^3 - 7.2x^2 + 22.9x$.
 - a. Sketch the regression equation on the given coordinate plane.



- b. For what interval(s) is the model appropriate for the problem situation? Explain your reasoning.