2-7

Study Guide

Daledgebra Rational Numbers

Dividing Rational Numbers

Use the following rules to divide rational numbers.

Rule or Property		Example
Dividing Rational Numbers	The quotient of two numbers is positive if the numbers have the same sign. The quotient of two numbers is negative if the numbers have different signs.	$-60 \div (-10) = 6$ $-48 \div 4 = -12$
Multiplicative Inverse Property	For every nonzero number a, there is exactly one number $\frac{1}{a}$, such that $(a)\frac{1}{a} = \frac{1}{a}(a) = 1$.	$\frac{1}{3} \div \frac{3}{4} = \frac{1}{3} \cdot \frac{4}{3}$ $= \frac{4}{9}$
Division Rule	For all numbers a and b, with $b \neq 0$, $a \div b = \frac{a}{b} = a\left(\frac{1}{b}\right) = \frac{1}{b}(a)$.	$6 \div 2 = \frac{6}{2}$ $= (6)\frac{1}{2}$ $= \frac{1}{2}(6) = 3$

Since the fraction bar indicates division, you can use the division rules and the distributive property to simplify rational expressions.

Example: Simplify $\dfrac{-20a + 15}{5}$.

$$\frac{-20a + 15}{5} = (-20a + 15)\left(\frac{1}{5}\right)$$
$$= (-20a)\left(\frac{1}{5}\right) + (15)\left(\frac{1}{5}\right)$$
$$= -5a + 3$$

Simplify.

1. $\dfrac{-44a}{4}$

2. $\dfrac{16x}{2}$

3. $\dfrac{80}{5}$

4. $\dfrac{81}{-27}$

5. $\dfrac{-144a}{6}$

6. $\dfrac{-30}{-10} \div \dfrac{30}{10}$

7. $\dfrac{57y}{3}$

8. $-\dfrac{1}{2} \div 8$

9. $\dfrac{18a - 6b}{-3}$

10. $\dfrac{12x}{3} \div \dfrac{1}{12x} + xyz$

11. $\dfrac{36a - 12}{12}$

12. $\dfrac{-\frac{5}{8}}{5}$