

2-4 Dividing Rational Numbers (Pages 84–87)

You can use the same rules of signs when dividing rational numbers that you used for multiplying.

Dividing Two Rational Numbers	The quotient of two numbers having the <i>same sign</i> is positive.
	The quotient of two numbers having <i>different signs</i> is negative.

If a fraction has one or more fractions in the numerator or denominator, it is a **complex fraction**. To simplify a complex fraction, rewrite it as a division expression.

Examples

a. Simplify $\frac{\frac{4}{7}}{-8}$.

Rewrite the complex fraction as $\frac{4}{7} \div (-8)$.

$$\begin{aligned} \frac{4}{7} \div (-8) &= \frac{4}{7} \cdot \left(-\frac{1}{8}\right) && \text{Multiply by } -\frac{1}{8}, \text{ the} \\ & && \text{reciprocal of } -8. \\ &= -\frac{4}{56} \text{ or } -\frac{1}{14} && \text{The signs are different,} \\ & && \text{so the product is} \\ & && \text{negative.} \end{aligned}$$

b. Simplify $\frac{-2x + 10y}{5}$.

$$\begin{aligned} \frac{-2x + 10y}{5} &= \frac{-2x}{5} + \frac{10y}{5} && \text{Divide each term by 5.} \\ &= -\frac{2}{5}x + 2y && \text{Simplify.} \end{aligned}$$

Practice

Simplify.

1. $22 \div \left(\frac{11}{13}\right)$

2. $24 \div \left(-\frac{1}{8}\right)$

3. $\frac{-14}{-2}$

4. $\frac{\frac{15}{-64}}{\frac{3}{3}}$

5. $\frac{\frac{30}{-7}}{-10}$

6. $\frac{\frac{8}{-4}}{-9}$

7. $\frac{-32m}{8}$

8. $-18t \div \frac{8}{9}$

9. $\frac{2a + 8}{4}$

10. $\frac{8x + 42y}{6}$

11. $\frac{-12h + (-18g)}{3}$

12. $\frac{54s + 3w}{-6}$

Evaluate each expression if $x = 4$, $y = -5$, and $z = -1.5$.

13. $\frac{y}{z}$

14. $\frac{xy}{xz}$

15. $\frac{x + z}{3}$

16. **Standardized Test Practice** How many boxes of peanuts can you get from 52 pounds of peanuts if each box holds $1\frac{5}{8}$ pounds of peanuts?
A 84 **B** 32 **C** 26 **D** 50

Answers: 1. 26	2. -192	3. 7	4. $-\frac{64}{5}$	5. $\frac{7}{3}$	6. -18	7. -4m	8. $-20\frac{4}{7}t$	9. $\frac{2}{1}a + 2$	10. $\frac{3}{1}x + 7y$	11. $-4h - 6g$	12. $-9s - \frac{2}{1}w$	13. $3\frac{3}{1}$	14. $3\frac{3}{1}$	15. $\frac{6}{5}$	16. B
----------------	---------	------	--------------------	------------------	--------	--------	----------------------	-----------------------	-------------------------	----------------	--------------------------	--------------------	--------------------	-------------------	-------