

## Pre-Algebra

Essential Question: How do we multiply and divide rational numbers?

**Do Now:**

a)  $2\frac{1}{2} \cdot 3\frac{3}{4}$

b)  $2\frac{1}{2} \div 3\frac{3}{4}$



How do we multiply and divide rational numbers? Consider a and b from the Do Now.

a) How does the product change if the expression is  $-2\frac{1}{2} \cdot 3\frac{3}{4}$ ?

b) How does the quotient change if the expression is  $-2\frac{1}{2} \div -3\frac{3}{4}$ ?

Multiplying Rational Numbers	Dividing Rational Numbers
1) Change all mixed numbers to improper fractions.	1) Dividing by multiplying by the multiplicative inverse ( <i>reciprocal</i> ). "Keep, Change, Flip"
2) Follow rules for multiplying integers.	2) Follow rules for dividing integers.

Simplify each numerical expression.

1)  $(-2.4)(3)$

2)  $-\frac{3}{10} \div -\frac{5}{15}$

3)  $\frac{1}{2} \div -\frac{7}{8}$

4)  $-2\frac{1}{2} \cdot 4\frac{3}{5}$

5)  $-36 \cdot \left(-\frac{4}{9}\right) \cdot -\frac{1}{8}$

6)  $7.5 \div -0.5$

7)  $\frac{12}{\frac{3}{\frac{4}{4}}}$

8)  $\frac{\frac{2}{3}}{-2\frac{1}{3}}$

**Numbers 7 and 8 are examples of complex fractions.**

A complex fraction is a fraction where the numerator, denominator, or both contain a fraction.



**Think about this...**

*Does every number have a multiplicative inverse?*

**IT'S YOUR TURN NOW**

9)  $(-1.8)(2)$

10)  $-\frac{1}{8} \times 5 \times -\frac{2}{3}$

11) A hot air balloon descended 99.6 meters in 12 seconds. What was the balloon's average rate of change in meters per second?

12) The ground temperature at Brigham Airport is  $12^{\circ}\text{C}$ . The temperature decreases by  $6.8^{\circ}\text{C}$  for every increase of 1 kilometer above the ground. What is the temperature outside of a plane flying at an altitude of 5 kilometers above the airport?



The rules for multiplying and dividing rational numbers are the same as the rules for multiplying and dividing integers.

When dividing fractions, \_\_\_\_\_

## HW #

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Evaluate each expression. Show all work.

1)  $-2.3 \times 0.4$

2)  $\left(-\frac{3}{5}\right)\left(\frac{15}{16}\right)\left(-\frac{2}{3}\right)$

3)  $-2\frac{1}{2} \times \frac{2}{3}$

4)  $\frac{1}{6} \div -\frac{1}{15}$

5)  $\frac{-10}{\frac{4}{-\frac{5}{5}}}$

6)  $\frac{\frac{2}{9}}{-\frac{4}{7}}$

7) The price of one share of Acme Company declined \$3.50 per day for 4 days in a row. What was the overall change in the price of one share?

8) To avoid a storm, a passenger-jet pilot descended 0.44 mile in 0.8 minute. What was the plane's average change of altitude in miles per minute?