

Dear Family,

Your child is learning about ratios expressed as complex fractions.



The ratio between two numbers is often written as a fraction. When one or both of the numbers being compared is a fraction, the ratio becomes a complex fraction (a fraction that contains another fraction). Your child is learning to interpret and simplify complex fractions to find unit rates and solve ratio problems.

When you know a unit rate, for example, the cost of one gallon of gas, you can then easily find the cost of several gallons. Unit rates also make it easy to compare costs of different items. Often, you need to calculate to find a unit rate.

Consider this situation:

 Grove Fresh Orange Juice 1 gallon: \$4.50	 SUNSHINE ORANGE JUICE $\frac{3}{4}$ GALLON: \$3.30
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To find the better buy, you need to figure out the price of 1 gallon for both choices. Then you can compare the unit rates.

The next page shows two different ways your child might find the unit rate for the smaller bottle.

Vocabulary

unit rate the numerical part of the rate, without the units. For a rate of $\frac{2}{5}$ dollar per apple, the unit rate is $\frac{2}{5}$.

complex fraction a fraction that contains another fraction.

example: $\frac{12}{\frac{3}{4}}$ or $\frac{\frac{1}{2}}{\frac{2}{3}}$

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Ratios Involving Complex Fractions: Sample Solution

You want to know which size bottle of orange juice has a lower price per gallon.

- The larger bottle has a price of $4\frac{1}{2}$ dollars for 1 gallon.
- The smaller bottle has a price of $3\frac{3}{10}$ dollars for $\frac{3}{4}$ gallon.

To compare the prices, you need to find the unit price for the smaller bottle.

One way:

Write the ratio $3\frac{3}{10} : \frac{3}{4}$ as a fraction.

$$\frac{3\frac{3}{10}}{\frac{3}{4}}$$

Interpret the fraction as division.

$$\frac{33}{10} \div \frac{3}{4} = \frac{33}{10} \times \frac{4}{3}$$

Then simplify.

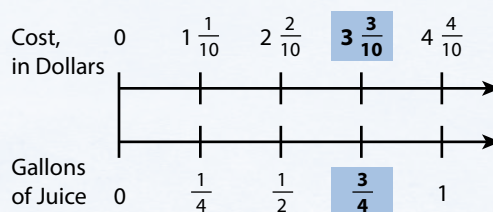
$$\frac{33}{10} \times \frac{4}{3} = \frac{44}{10}, \text{ or } 4\frac{4}{10}$$

Another way:

Use a double number line to show the relationship between fractions of a gallon and cost.

Have one number line show gallons, marked in fourths. The other number line shows cost, in fractions of a dollar.

- The cost for $\frac{3}{4}$ gallon is shown above the $\frac{3}{4}$ mark.
- Because $\frac{3}{4}$ is $\frac{1}{4} \times 3$, the cost for each $\frac{1}{4}$ gallon is a third of $3\frac{3}{10}$, or $1\frac{1}{10}$.
- So the cost of a whole gallon would be $1\frac{1}{10}$ more than $3\frac{3}{10}$, or $4\frac{4}{10}$.



Answer: Both methods show that the unit rate for the small bottle is $4\frac{4}{10}$, meaning that the cost of 1 gallon is \$4.40. The unit rate for the large bottle is \$4.50. The smaller bottle is a better buy.