

Math Scene Investigators

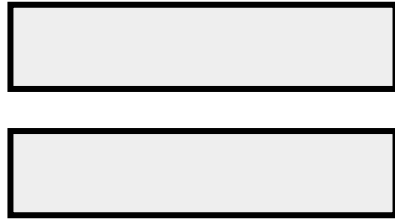
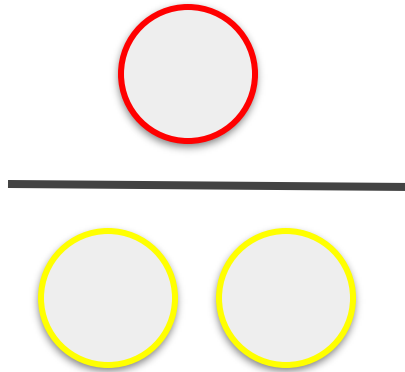
Ratio & Proportion Units



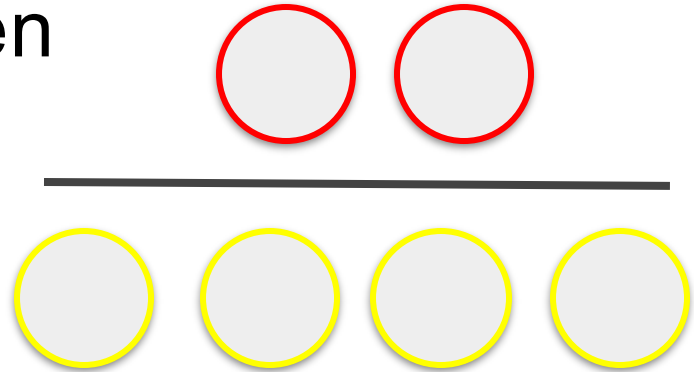
Proportion

when you have two equivalent ratios

if

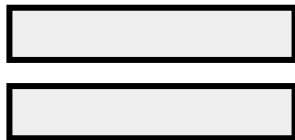
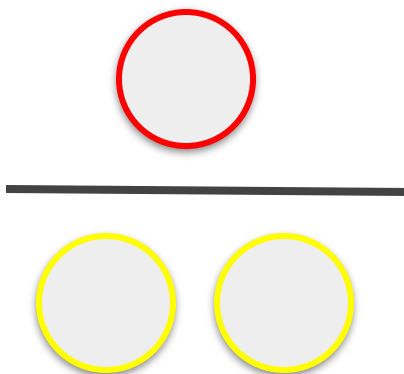


then



Equivalence

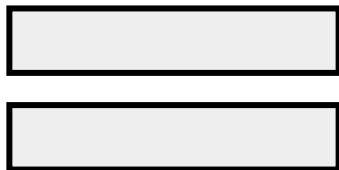
means equal in value



$$\frac{1}{2}$$

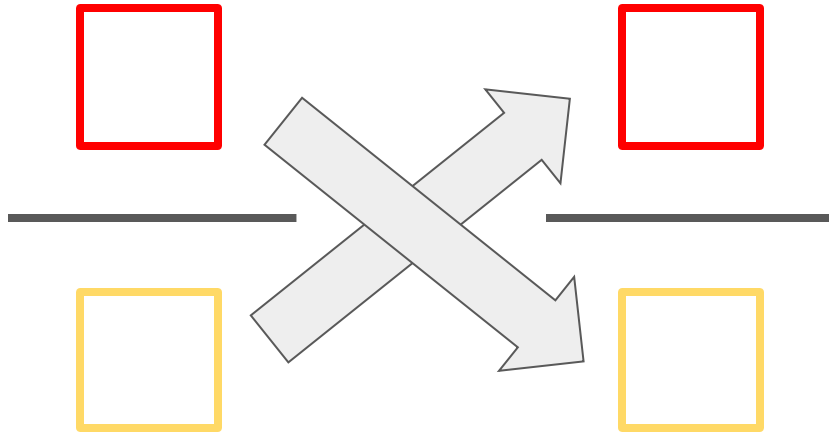
Equivalence

means equal in value



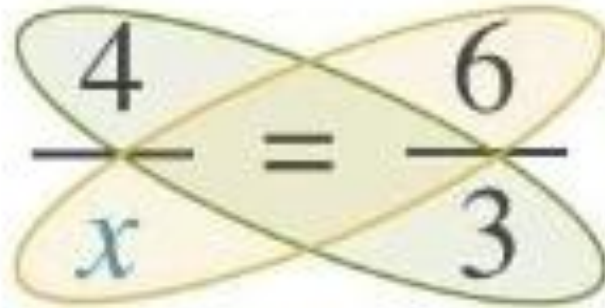
Cross Multiply

multiplying the top of the left ratio by the bottom of the right ratio,
and the bottom of the left ratio by the top of the right ratio.



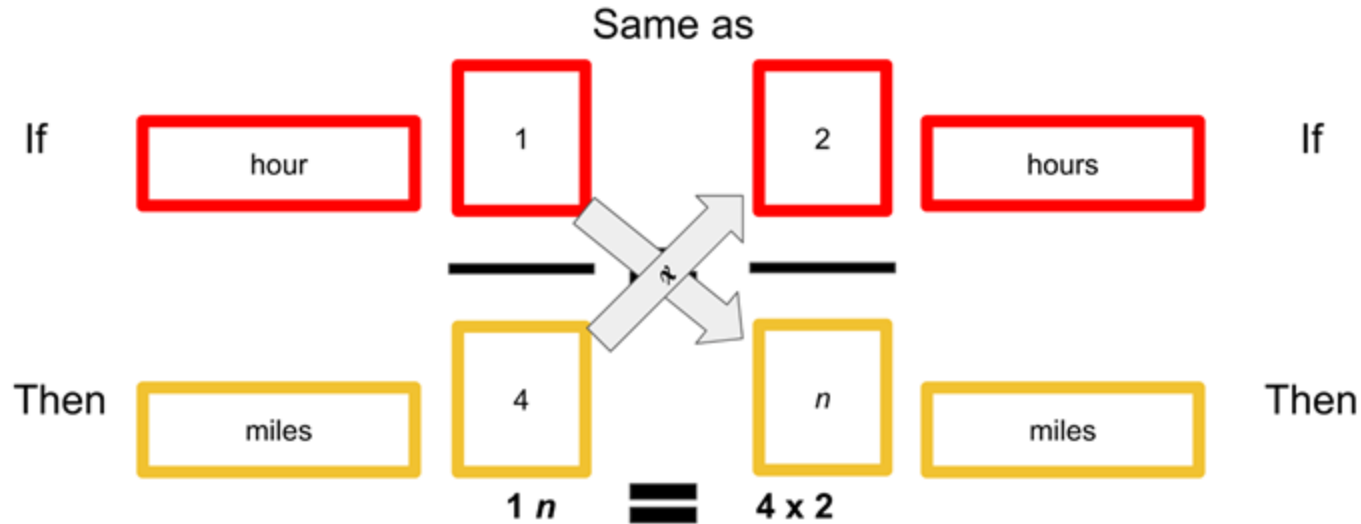
Cross Multiply

multiplying the top of the left ratio by the bottom of the right ratio, and the bottom of the left ratio by the top of the right ratio.


$$\frac{4}{x} = \frac{6}{3}$$

Cross Multiply

multiplying the top of the left ratio by the bottom of the right ratio, and the bottom of the left ratio by the top of the right ratio.



Isolate the variable

using an inverse operation to get a variable to be by itself

$$1n = 5 \times 2$$

$$\frac{1n}{1} = \frac{5 \times 2}{1}$$

$$n = 10$$

Isolate the variable

When solving for the unknown (variable) in an algebraic equation, the variable must appear by itself on one side of the equation. Inverse operations are used to isolate the variable

The diagram illustrates the process of isolating a variable. It features two large grey arrows pointing right. The top arrow is labeled "Isolate the variable:" and the bottom arrow is labeled "Inverse operation:" with a visual representation of the inverse operation: a multiplication symbol (\times) followed by an arrow pointing to a division symbol (\div).

To the right of the arrows, the algebraic equation is shown in two stages. In the first stage, the variable n is circled in green and is part of a fraction: $\frac{1n}{1}$. This is followed by an equals sign and the expression $\frac{4 \times 2}{1}$. In the second stage, the variable n is circled in green and is followed by an equals sign and the number 8.

$$\frac{1n}{1} = \frac{4 \times 2}{1}$$
$$n = 8$$

Inverse operation

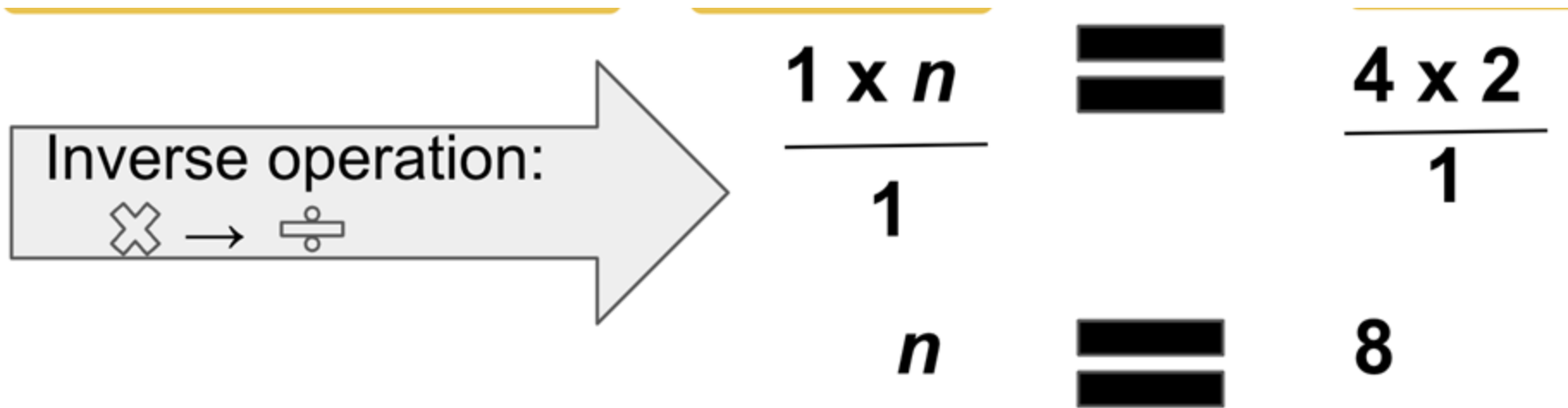
the opposite operation that undoes the original operation

$$5 \times 2 = 10$$

$$10 \div 2 = 5$$

Inverse operation

The opposite operation undoes the original operation. For example, the opposite of multiplication is division. The opposite of addition is subtraction



The diagram illustrates the concept of inverse operations. On the left, a large grey arrow points to the right. Inside the arrow, the text "Inverse operation:" is written above a visual representation of the inverse of multiplication: a multiplication symbol (\times) followed by a right-pointing arrow and then a division symbol (\div). To the right of the arrow, there are two equations. The first equation is $\frac{1 \times n}{1} = \frac{4 \times 2}{1}$, where the numerators are under horizontal lines and the denominators are below them. The second equation is $n = 8$, with equals signs represented by two thick black horizontal bars.

$$\begin{array}{ccc} \frac{1 \times n}{1} & = & \frac{4 \times 2}{1} \\ n & = & 8 \end{array}$$