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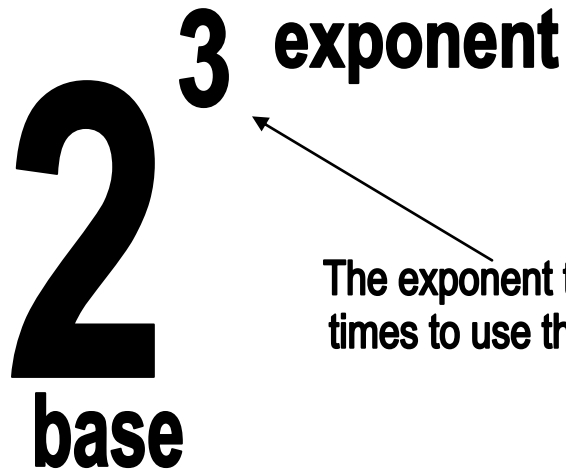
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POWERS

$$\mathbf{2}^{\mathbf{3}}$$

base

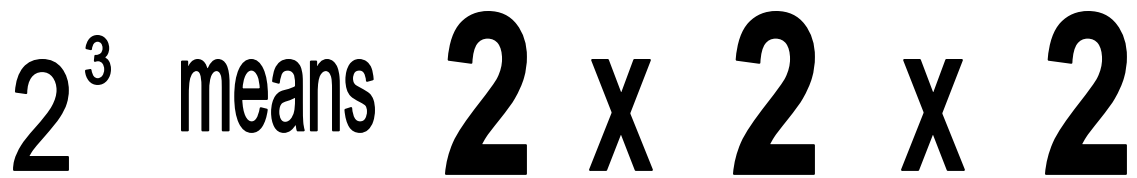
3 exponent

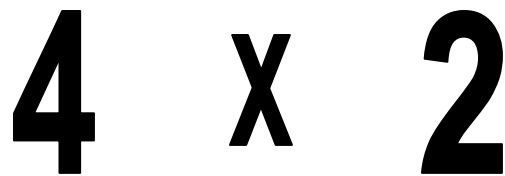


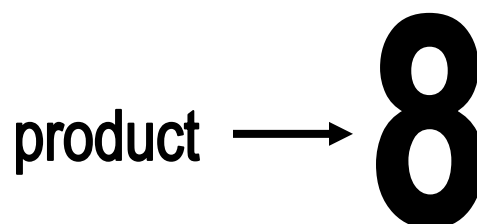
The exponent tells you how many times to use the base as a factor.



Read 2^3 as *two to the third power* or *two to the power of three*.

$$2^3 \text{ means } \mathbf{2} \times \mathbf{2} \times \mathbf{2}$$


$$\mathbf{4} \times \mathbf{2}$$


$$\text{product} \rightarrow \mathbf{8}$$


IMPROPER FRACTION TO MIXED NUMBER

Since the top number (numerator) is top heavy, imagine that it falls down into the division box and becomes the dividend. Divide and write the remainder as a fraction.

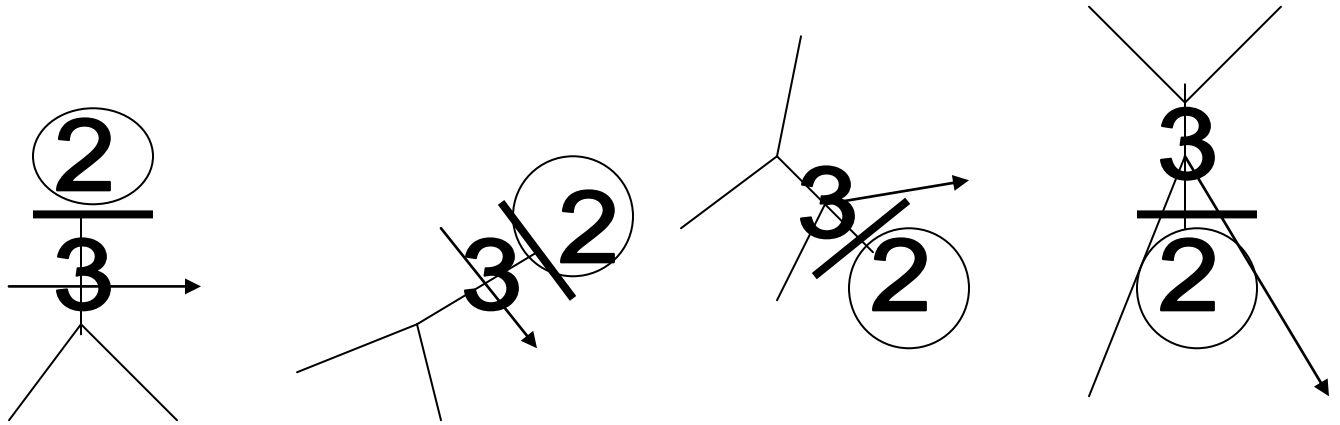
$$\begin{array}{r} 8 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 1 \\ \hline 7 \end{array}$$

1 ← remainder
—
7 ← divisor

So, $\frac{8}{7} = 1\frac{1}{7}$

The word reciprocal means the opposite. Sometimes you need to find the reciprocal of fractions. To find the reciprocal of a fraction, imagine that it is a person doing a handstand. Crazy visual pictures help us no matter how old we are. Most students are visual learners.



Flip a fraction upside down to show its opposite or reciprocal.

THE FOLLOWING EXAMPLES SHOW RECIPROCAL:

$$\frac{4}{5} \xrightarrow{\text{reciprocal is}} \frac{5}{4} \quad \parallel \parallel \parallel \quad \frac{1}{6} \xrightarrow{\text{reciprocal is}} \frac{6}{1}$$

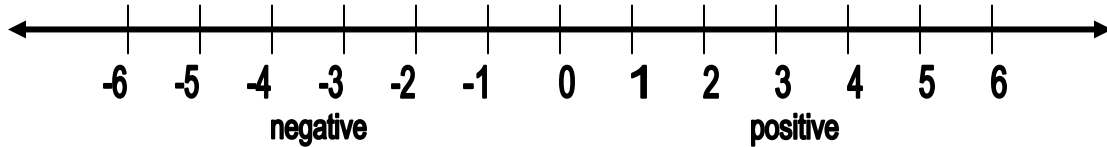
Sometimes you will have to find the reciprocal of a whole number. Remember that you cannot have a whole number when performing operations with fractions. Turn the whole number into a fraction first, then make a reciprocal:

$$2 = \frac{2}{1} \xrightarrow{\text{reciprocal is}} \frac{1}{2}$$

HINT: TURN MIXED NUMBERS INTO RECIPROCAL LIKE THIS: $1 \frac{1}{2} = \frac{3}{2} \rightarrow \frac{2}{3}$

INTEGERS – MULTIPLICATION

Integers are WHOLE numbers and their OPPOSITES as seen on the number line below:



Use the method on the left hand side of the page below or follow this crazy example. Use the signs in front of the numbers like this: First number's sign can be positive or negative. A positive stands for a *good guy* and a negative stands for a *bad guy*. The second number's sign can be positive or negative. A positive stands for *comes to town* and a negative stands for *leaves town*. The sign for the third number, which is the answer, can be positive or negative. A positive sign means *it's a good thing* and a negative sign means *it's a bad thing*. Remember that if a *good guy comes to town, it's a good thing*. If a *bad guy comes to town, it's a bad thing*. At the same time, if a *good guy leaves town, it's a bad thing* and if a *bad guy leaves town, it's a good thing*. To use this crazy trick, follow the examples on the right hand side.

Multiplying numbers with like signs will result in a positive number.

$$\begin{array}{ccccccc}
 +2 & \times & +1 & = & +2 \\
 \text{Good guy} & & \text{Comes to town} & & \text{It's a good thing}
 \end{array}$$

In other words:

$$\begin{array}{l}
 + \text{ times } + = + \\
 - \text{ times } - = +
 \end{array}$$

$$\begin{array}{ccccccc}
 -2 & \times & -1 & = & +2 \\
 \text{Bad guy} & & \text{Leaves town} & & \text{It's a good thing}
 \end{array}$$

Multiplying numbers with unlike signs will result in a negative number.

$$\begin{array}{ccccccc}
 +2 & \times & -1 & = & -2 \\
 \text{Good guy} & & \text{Leaves town} & & \text{It's a bad thing}
 \end{array}$$

In other words:

$$\begin{array}{l}
 - \text{ times } + = - \\
 + \text{ times } - = -
 \end{array}$$

$$\begin{array}{ccccccc}
 -2 & \times & +1 & = & -2 \\
 \text{Bad guy} & & \text{Comes to town} & & \text{It's a bad thing}
 \end{array}$$