Fractions, Decimals, and Percents

Operation	Explanation	Example
Convert a decimal to a percent	Move the decimal point 2 places to the right and add a percent (%) sign. If you need to, add a zero on the back to get the second decimal place.	.123 = 12.3%
Convert a percent to a decimal	Move the decimal point 2 places to the left. If you need to, put a zero on the front.	5% = .05
Convert a fraction to a decimal	Divide the numerator by the denominator, using your calculator.	1/8 = .125
Convert a percent to a fraction	First turn the number into a decimal. Then turn the number into a fraction by putting it over 10, 100, 1000, or whatever number is big enough to have enough zeroes for each place after the decimal.	18% = .18 = 18/100 = 9/50

Memorize the common fractions, decimals and percents in this table

Fraction	Decimal	Percent	Fraction	Decimal	Percent
$\frac{1}{4}$	.25	25%	$\frac{1}{8}$	.125	12.5% or $12\frac{1}{2}$%
$\frac{1}{2} = \frac{2}{4}$	.5	50%	$\frac{1}{4} = \frac{2}{8}$	.25	25%
$\frac{3}{4}$	.75	75%	$\frac{3}{8}$	.375	37.5%
			$\frac{1}{2} = \frac{4}{8}$	.5	50%
$\frac{1}{3}$	.33333	$33\frac{1}{3}$%	$\frac{5}{8}$	.625	62.5%
$\frac{2}{3}$	.66666	$66\frac{2}{3}$%	$\frac{3}{4} = \frac{6}{8}$	.75	75%
			$\frac{7}{8}$	.875	87.5%
$\frac{1}{10}$	.1	10%			

$\dfrac{2}{10}$	.2	20%	$\dfrac{1}{1}$	1.0	100%
$\dfrac{3}{10}$	.3	30%	$\dfrac{2}{1}$	2.0	200%

Converting Between Decimals, Fractions, and Percents *(page 1 of 4)*

Percentages refer to fractions of a whole; that is, whatever you're looking at, the percentage is how much of the whole thing you have. For instance, "50%" means " $1/2$ "; "25%" means " $1/4$ "; "40%" means " $2/5$ "; et cetera.

Often you will need to figure out what percentage of something another thing is. For instance, if a class has 26 students, and 14 are female, what percentage of the students are female? It is 14 out of 26, or $^{14}/_{26} = 0.538461538462...$, or about 54%. (For more information on percent word problems, look at the [Percent of](#) lesson.)

"Percent" is actually "per cent", meaning "out of a hundred". (It comes from the Latin *per centum* for "thoroughly hundred".) You can use this "out of a hundred" meaning, along with the fact that fractions indicate division, to convert between fractions, percents, and decimals.

Percent to Decimal

Percent-to-decimal conversions are easy; you mostly just move the decimal point two places. The way I keep it straight is to remember that 50%, or one-half, of a dollar is $\$0.50$. In other words, you have to move the decimal point two places to the left when you convert from a percent (50%) to a decimal (0.50). Some more examples are:

$$27\% = 0.27$$
$$104\% = 1.04$$
$$0.5\% = 0.005$$

You can use the Mathway widget below to practice "Ratios, Proportions, and Percents", subtopic "Converting Percents to Decimal". Try the entered exercise, or type in your own exercise. Then click "Answer" to compare your answer to Mathway's. (Or skip the widget and [continue](#) with the lesson.)

(Clicking on "View Steps" on the widget's answer screen will take you to the Mathway site, where you can register for a free seven-day trial of the software.)

Percent to Fraction

Percent-to-fraction conversions aren't too bad. This is where you use the fact that "percent" means "out of a hundred". Convert the percent to a decimal, and then to a fraction. For instance:

$$40\% = 0.40 = \frac{40}{100}$$

Now you can reduce the fraction:

$$\frac{40}{100} = \frac{4}{10} = \frac{2}{5}$$

Most conversions are simple like this, but some require a little extra care. The reason I converted to a decimal first is that the number of decimal places tells me how many zeroes to have underneath. Notice that "0.40" can also be written as "0.4". Then $0.4 = {}^4/_{10} = {}^2/_5$, which is the same answer as before. It works out because "0.4" has one decimal place and "10" has one zero. This concept (matching the number of decimal places with the number of zeroes) helps in more complicated problems:

$$104\% = 1.04 = \frac{104}{100} = \frac{26}{25}$$

Another example:

$$0.5\% = 0.005 = \frac{5}{1000} = \frac{1}{200}$$

$$33\tfrac{1}{3}\% = 0.33\tfrac{1}{3} = \frac{33\frac{1}{3}}{100} = \frac{\frac{100}{3}}{100} = \frac{100}{3} \cdot \frac{1}{100} = \frac{1}{3}$$

$$12\tfrac{1}{2}\% = 12.5\% = 0.125 = \frac{125}{1000} = \frac{1}{8}$$

Fraction to Decimal

If you remember that fractions are division, then this is easy. The calculator can do the work for you, because you can just have it do the division. For example:

$$\frac{3}{5} = 3 \div 5 = 0.6$$

$$\frac{1}{3} = 1 \div 3 = 0.333333... = 0.\overline{3}$$

The bar is placed over the repeating digits, for convenience sake.

$$\frac{3}{4} = 3 \div 4 = 0.75$$

$$\frac{2}{7} = 0.285714285714... = 0.\overline{285714}$$

When converting fractions to decimals, you may be told to round to a certain place or to a certain number of decimal places. For instance, looking at that last example, ${}^2/_7$ as a decimal rounded to the nearest tenth (rounded to one decimal place) is 0.3; to the nearest hundredth (to two decimal places) is 0.29; to the nearest thousandths (to three decimal places) is 0.286; to the nearest ten-thousandths (to four decimal places) is 0.2857; et cetera. If you're not sure how you should format your answer, then give the "exact" form and the rounded form:

$$\frac{2}{7} = 0.\overline{285714} \approx 0.286$$

Note that the rounded form can be useful for word problems, where a final answer in rounded form may be more practical than a repeating decimal.