**Decimals, Fractions and Percentages**

**Decimals, Fractions and Percentages are just different ways of showing the same value:**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| http://www.mathsisfun.com/images/fractions/pie-1-2.jpg | |  |  | | --- | --- | | **A Half** can be written... | | |  |  | | As a fraction: | 1/2 | | As a decimal: | 0.5 | | As a percentage: | 50% | |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| http://www.mathsisfun.com/images/fractions/pie-1-4.jpg | |  |  | | --- | --- | | **A Quarter** can be written... | | |  |  | | As a fraction: | 1/4 | | As a decimal: | 0.25 | | As a percentage: | 25% | |

Example Values

Here is a table of commonly occuring values shown in Percent, Decimal and Fraction form:

|  |  |  |
| --- | --- | --- |
| **Percent** | **Decimal** | **Fraction** |
| 1% | 0.01 | 1/100 |
| 5% | 0.05 | 1/20 |
| 10% | 0.1 | 1/10 |
| 12½% | 0.125 | 1/8 |
| 20% | 0.2 | 1/5 |
| 25% | 0.25 | 1/4 |
| 331/3% | 0.333... | 1/3 |
| 50% | 0.5 | 1/2 |
| 75% | 0.75 | 3/4 |
| 80% | 0.8 | 4/5 |
| 90% | 0.9 | 9/10 |
| 99% | 0.99 | 99/100 |
| **100%** | **1** |  |
| 125% | 1.25 | 5/4 |
| 150% | 1.5 | 3/2 |
| 200% | 2 |  |

Converting Between Percentage and Decimal

Percentage means "per 100", so 50% means 50 per 100, or simply 50/100. If you divide 50 by 100 you get 0.5 (a decimal number). So:

* To [convert from percentage to decimal](http://www.mathsisfun.com/converting-percents-decimals.html): divide by 100 (and remove the "%" sign).
* To [convert from decimal to percentage](http://www.mathsisfun.com/converting-decimals-percents.html): multiply by 100 (and add a "%" sign).

The easiest way to multiply (or divide) by 100 is to **move the decimal point 2 places**. So:

|  |  |  |
| --- | --- | --- |
| From Decimal | To Percent |  |
| http://www.mathsisfun.com/images/decimal-to-percent.gif | | move the decimal point **2 places to the right**, and add the "%" sign. |

... or ...

|  |  |  |
| --- | --- | --- |
| From Percent | To Decimal |  |
| http://www.mathsisfun.com/images/percent-to-decimal.gif | | move the decimal point **2 places to the left**, and remove the "%" sign. |

Converting Between Fractions and Decimals

The easiest way to [convert a fraction to a decimal](http://www.mathsisfun.com/converting-fractions-decimals.html) is to divide the top number by the bottom number (divide the numerator by the denominator in mathematical language)

Example: Convert 2/5 to a decimal

Divide 2 by 5: 2 ÷ 5 = 0.4

**Answer: 2/5 = 0.4**

To [convert a decimal to a fraction](http://www.mathsisfun.com/converting-decimals-fractions.html) needs a little more work:

|  |  |
| --- | --- |
| **Steps** | **Example** |
| First, write down the decimal "over" the number 1 | 0.75 / 1 |
|  |  |
| Then multiply top and bottom by 10 for every number after the decimal point (10 for 1 number, 100 for 2 numbers, etc) | 0.75 × 100 / 1 × 100 |
| (This makes it a correctly formed fraction) | = 75 / 100 |
|  |  |
| Then [Simplify](http://www.mathsisfun.com/simplifying-fractions.html) the fraction | 3 / 4 |

Converting Between Percentages and Fractions

The easiest way to [convert a fraction to a percentage](http://www.mathsisfun.com/converting-fractions-percents.html) is to divide the top number by the bottom number. then multiply the result by 100 (and add the "%" sign)

Example: Convert 3/8 to a percentage

First divide 3 by 8: 3 ÷ 8 = 0.375,  
Then multiply by 100: 0.375 x 100 = 37.5  
Add the "%" sign: 37.5%

**Answer: 3/8 = 37.5%**

To [convert a percentage to a fraction](http://www.mathsisfun.com/converting-percents-fractions.html), first convert to a decimal (divide by 100), then use the steps for converting decimal to fractions.