The fraction family (7–9)

Contents

1 The fraction family

Many numbers can be expressed as either a fraction, a decimal or a percentage. These are the three members of the fraction family and are different ways of expressing the same thing.E.g.

$$\frac{1}{2} \qquad 0.5 \qquad 50\%$$

The above example is probably one you simply "just know". Here are some other examples that you need to spend time committing to memory since it is good to "just know" these too. Get a family member or friend to test you on these:

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{1}{3}$	0.333333...	33.333...% or 33%
$\frac{1}{4}$	0.25	25%
$\frac{1}{5}$	0.2	20%
$\frac{1}{6}$	0.16666666...	16.6666...% or 16%
$\frac{1}{8}$	0.125	12.5%
$\frac{1}{9}$	0.11111111...	11.1111...% or 11%
$\frac{1}{10}$	0.1	10%
$\frac{1}{20}$	0.05	5%
$\frac{1}{50}$	0.02	2%
$\frac{1}{100}$	0.01	1%

Look for patterns here that will help you remember. E.g.

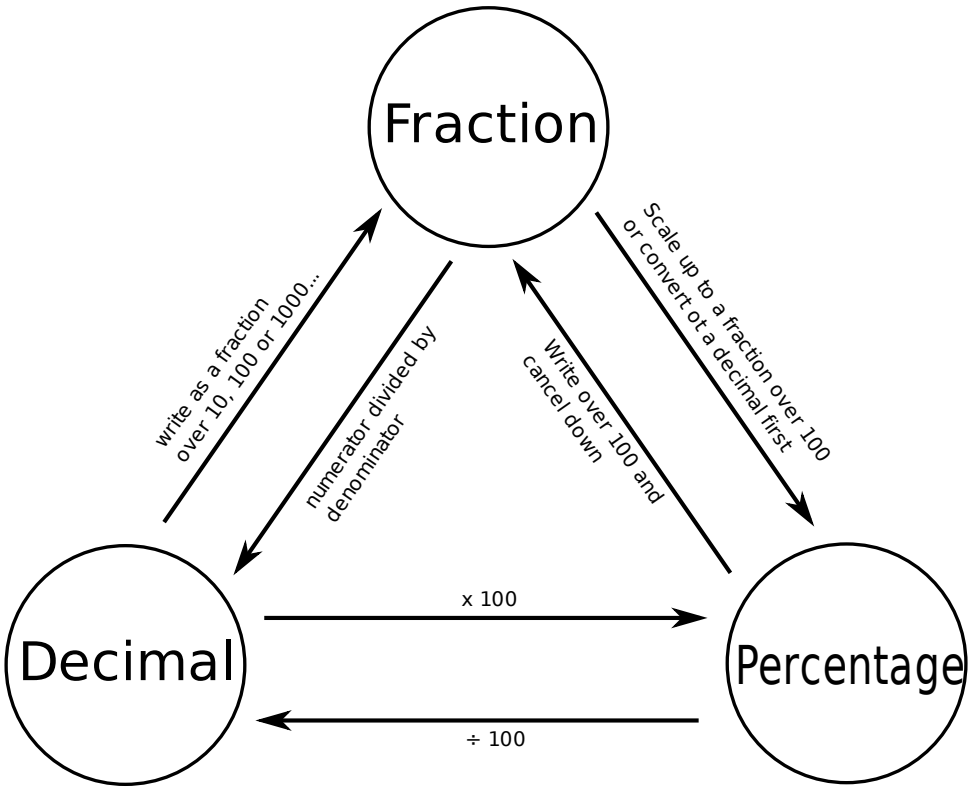
- Since $\frac{1}{2} = 0.5$ we notice that $\frac{1}{5} = 0.2$: the "2" and the "5" have swapped.
- Given $\frac{1}{5} = 0.2$ it follows that $\frac{1}{50} = 0.02$ as it is 10 times smaller.
- Given that $\frac{1}{4} = 0.25 = 0.250$, halving it gives us $\frac{1}{8} = 0.125$
- In $\frac{1}{6} = 0.166666\ldots$, notice that both the fraction and decimal have the digits one and six in them.

It is also possible to infer other fractions, decimals and percentages from the ones that we have learned above. E.g.

Since $\frac{1}{9} = 0.11111\ldots$ then $\frac{2}{9} = 0.2222\ldots$ and $\frac{7}{9} = 0.77777\ldots$ and so on.

2 Converting between fractions, decimals and percentages

If we do not know the conversion, then we will have to undertake it. This diagram shows possible routes between the three members of this family:



The following examples should illustrate each point.

Decimal to Percentage. $0.043 = 0.043 \times 100 = 4.3\%$

Percentage to Decimal. $78\% = 78 \div 100 = 0.78$

Percentage to fraction.

$$13\% = \frac{13}{100} \qquad\qquad 42\% = \frac{42}{100} = \frac{21}{50}$$

Fraction to percentage.

$$\frac{11}{20} = \frac{11 \times 5}{20 \times 5} = \frac{55}{100} = 55\%$$

$$\frac{3}{7} = \ldots \text{too tricky, go via decimal (see below)}$$

Decimal to fraction.

$$0.4 = \frac{4}{10} = \frac{2}{5} \qquad \text{1 decimal place}$$

$$0.37 = \frac{37}{100} \qquad \text{2 decimal places}$$

$$0.1257 = \frac{1257}{10000} \qquad \text{4 decimal places}$$

Fraction to decimal. To work out $\frac{3}{7}$ as a decimal, we need to use division (careful to do $3 \div 7$ not $7 \div 3$).

$$\begin{array}{r|cccccccc} & 0. & 4 & 2 & 8 & 5 & 7 & 1 & 4 \\ \hline 7) & 3. & {}^{3}0 & {}^{2}0 & {}^{6}0 & {}^{4}0 & {}^{5}0 & {}^{1}0 & {}^{3}0 \end{array}$$

Therefore $\frac{3}{7} = 0.428571428571\ldots$ (This is called a recurring decimal)