

Calculating with Fractions

The parts of a fraction:

$$\frac{3}{4}$$

← **Numerator** (the number of parts of the whole you have)

←

Denominator (the total number of parts the whole has been split into)

Adding and subtracting fractions with the same denominator:

When adding and subtracting fractions with the same denominator, only the numerators are added.

$$\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$$

Adding and subtracting fractions with different denominators:

When adding and subtracting fractions with different denominators, you must first give both fractions the same denominator (a common multiple of both denominators) by making equivalent fractions. Then the calculation is done in the same way as above.

$$\begin{array}{r} \frac{2}{3} + \frac{1}{4} = \\ \begin{array}{c} \downarrow \times 4 \\ \frac{8}{12} \end{array} + \begin{array}{c} \downarrow \times 3 \\ \frac{3}{12} \end{array} = \frac{11}{12} \end{array}$$

Multiplying fractions:

When multiplying fractions, you simply multiply the numerators together and the denominators together.

$$\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$$

When multiplying a fraction by a whole number, put the whole number over 1 and do the same thing.

$$\frac{1}{2} \times 3 = \frac{1}{2} \times \frac{3}{1} = \frac{3}{2}$$

Dividing fractions:

When dividing fractions, we use the phrase “keep it, change it, flip it!”

1. “Keep it” – this means the first fraction is kept the same
2. “Change it” – this means that the operation sign is changed from a division to a multiplication.
3. “Flip it” – this means that the second fraction is flipped so the numerator and denominator are swapped over.
4. You then multiply the numerators together and the denominators together to get your answer.

$$\begin{array}{ccc} \frac{1}{2} & \div & \frac{5}{6} \\ \downarrow & & \downarrow \\ \frac{1}{2} & \times & \frac{6}{5} = \frac{6}{10} \end{array}$$

When dividing by a whole number, this should be put over 1 and calculated in the same way as above.

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