Arithmetic

When multiplying or dividing positive and negative numbers the sign of the result is given by:

$$\text{positive} \times \text{positive} = \text{positive} \quad \text{positive} \times \text{negative} = \text{negative}$$

$$\text{negative} \times \text{positive} = \text{negative} \quad \text{negative} \times \text{negative} = \text{positive}$$

$$\frac{\text{positive}}{\text{positive}} = \text{positive} \qquad \frac{\text{positive}}{\text{negative}} = \text{negative}$$

$$\frac{\text{negative}}{\text{positive}} = \text{negative} \qquad \frac{\text{negative}}{\text{negative}} = \text{positive}$$

The BODMAS rule reminds us of the order in which operations are carried out. BODMAS stands for:

Brackets ()	First priority
Of $\times$	Second priority
Division $\div$	Second priority
Multiplication $\times$	Second priority
Addition $+$	Third priority
Subtraction $-$	Third priority

Fractions.

$$\text{fraction} = \frac{\text{numerator}}{\text{denominator}}$$

Adding and subtracting fractions.

To add or subtract two fractions first rewrite each fraction so that they have the same denominator. Then, the numerators are added or subtracted as appropriate and the result is divided by the common denominator: e.g.

$$\frac{4}{5} + \frac{3}{4} = \frac{16}{20} + \frac{15}{20} = \frac{31}{20}$$

Multiplying fractions.

To multiply two fractions, multiply their numerators and then multiply their denominators: e.g.

$$\frac{3}{7} \times \frac{5}{11} = \frac{15}{77}$$

Dividing fractions.

To divide two fractions, invert the second and then multiply: e.g.

$$\frac{3}{5} \div \frac{2}{3} = \frac{3}{5} \times \frac{3}{2} = \frac{9}{10}$$