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

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

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