



**BIDMAS** is the acronym to give the priority of operations:

**Brackets, Indices** (powers and roots),  
**Division AND Multiplication, Addition AND Subtraction**

Do anything in brackets first, then any indices, then, from left to right, and divisions or multiplications, then, from left to right, any additions or subtractions.

[Video 211 - https://tinyurl.com/y98jn4wk](https://tinyurl.com/y98jn4wk)

= means equals

≠ means not equals

≈ means roughly equals

A **function** is a rule that acts on a number.  
Eg)  $x2$  (times 2)

An **inverse function** reverses the effect of a function

+ and - are inverse operations

$\times$  and  $\div$  are inverse operations

**Key Points:**



<https://tinyurl.com/y7zu7719>

**Squaring** a number means multiplying it by itself. The result is a **square number**. Eg)  $4^2 = 4 \times 4 = 16$  which is a square number

[Video 226 - https://tinyurl.com/ya4v48rn](https://tinyurl.com/ya4v48rn)

**Cubing** a number means multiplying it by itself twice. The result is a **cube number**. Eg)  $4^3 = 4 \times 4 \times 4 = 64$  which is a cube number

[Video 212 - https://tinyurl.com/ydd72o3cd](https://tinyurl.com/ydd72o3cd)

The **square root** of a number is the number you must square to get the original number. It is the inverse of squaring. Eg)  $\sqrt{16} = 4$

[Video 228 - https://tinyurl.com/yc28q7lv](https://tinyurl.com/yc28q7lv)

The **cube root** of a number is the number you must cube to get the original number. It is the inverse of cubing. Eg)  $\sqrt[3]{64} = 4$

[Video 214 - https://tinyurl.com/y9q9m7nb](https://tinyurl.com/y9q9m7nb)

A **prime number** has two factors, itself and 1. Eg) 2, 3, 5, 7, 11, 13, 17, 19, 23...

[Video 225 - https://tinyurl.com/ybnk7z5n](https://tinyurl.com/ybnk7z5n)

To **multiply powers** of the same number, add the indices, e.g.  $4^3 \times 4^8 = 4^{11}$

To **divide powers** of the same number, subtract the indices, e.g.  $4^8 \div 4^3 = 4^5$

[Video 174 - https://tinyurl.com/za9u7h2](https://tinyurl.com/za9u7h2)

**Knowledge Check:**



<https://tinyurl.com/ya7obwjs>

**Rounding** is where you approximate a number to make it more manageable. If we round to decimal places, we get rid of all digits after the required decimal place. The final decimal place goes up by one if the first digit we ignore is 5 or more. Eg)  $4.597 = 4.6$  (1 d.p.)

[Video 278 - https://tinyurl.com/y9x7ltoh](https://tinyurl.com/y9x7ltoh)

If we round to **significant figures**, we get rid of all digits after the required digits from the left (ignoring leading zeros). The final digit goes up by one if the first digit we ignore is 5 or more. Eg)  $0.0465 = 0.047$  (2 s.f.)

[Video 279a - https://tinyurl.com/yakhafup](https://tinyurl.com/yakhafup)

To **estimate** we round all numbers in a calculation to 1 significant figure (1 s.f.).

A **factor** is a number you can multiply by to get a desired number. Eg) 2 is a factor of 8

[Video 117 - https://tinyurl.com/zymmfev](https://tinyurl.com/zymmfev)

A **multiple** is a number you can divide by an integer to get a desired number. Eg) 16 is a multiple of 8

[Video 220 - https://tinyurl.com/yaudfco3](https://tinyurl.com/yaudfco3)

**Highest Common Factor (HCF)** is the highest factor that is common to two or more numbers. Eg) 4 is the HCF of 8 and 12

[Video 219 - https://tinyurl.com/zell3pzq](https://tinyurl.com/zell3pzq)

**Lowest Common Multiple (LCM)** is the lowest multiple that is common to two or more numbers. Eg) 24 is the LCM of 8 and 12

[Video 218 - https://tinyurl.com/y8hg8z35](https://tinyurl.com/y8hg8z35)

A **term** is a number, a letter, or a number and a letter multiplied together. Eg) 3, a, 2b, 4c<sup>2</sup>

[Video 19 - https://tinyurl.com/hgw9Ulw](https://tinyurl.com/hgw9Ulw)

Letters represent **variables**; the value can vary.

**Like terms** contain the same letters or power of letters, or are just numbers. Eg) 3 and 4, 3a and 6a, b<sup>3</sup> and 2b<sup>3</sup>

To **simplify** an expression we can **collect like terms**.

Eg) 3a + 2 + 4a = 7a + 2

[Video 9 - https://tinyurl.com/z77lutd](https://tinyurl.com/z77lutd)

We can also simplify multiplications by removing the multiplication symbol and divisions by making into a

fraction. Eg)  $2 \times a = 2a$ ,  $c \div d = \frac{c}{d}$  or  $\frac{c}{a}$

If we have an expression or equation and are given the value of a variable, we can **substitute** this value in. Eg)  $3a + b = c$  where  $a = 2$  becomes  $6 + b = c$

[Video 20 - https://tinyurl.com/zd6tv9j](https://tinyurl.com/zd6tv9j)

Key Points:



<https://tinyurl.com/y9j5u8ws>

A **formula** shows the relationship between terms. Eg)  $4a + b = c$

An **expression** is a collection of terms. Eg)  $2a + 1$

An **equation** is an expression equalling another. Eg)  $3b + 2 = 2d$

An **inequality** is where two expressions don't, or don't necessarily, equal each other (<, >, ≤, ≥). Eg)  $4f > 6$

An **identity** is two expressions that always equal each other, regardless of the variables. Eg)  $2(a + 5) \equiv 2a + 10$

A **not equal** symbol shows that two expressions do not equal each other. Eg)  $2a \neq b$

[Video 16 - https://tinyurl.com/j5cdu68](https://tinyurl.com/j5cdu68)

To multiply terms, multiply any numbers, put non-like terms next to each other, and add powers of like terms. Eg)  $2a \times 3a \times 4b = 24a^2b$

[Video 18 - https://tinyurl.com/ybaxlv6k](https://tinyurl.com/ybaxlv6k)

To multiply the same variable with powers, add the indices. Eg)  $2a^2 \times 4a^3 = 8a^5$

To divide the same variable with powers, subtract the indices. Eg)  $8a^5 \div 2a^3 = 4a^2$

[Video 11 - https://tinyurl.com/ycvjot5b](https://tinyurl.com/ycvjot5b)

Knowledge Check:



<https://tinyurl.com/yb8a3eto>

To **expand brackets**, multiply the terms in the brackets by the multiplier. Eg)  $5(a + 2) = 5 \times a + 5 \times 2 = 5a + 10$

[Video 13 - https://tinyurl.com/hepjutr](https://tinyurl.com/hepjutr)

To expand **double brackets**, multiply every term in one bracket by every term in the other. Eg)  $(a + b)(c + d) = a \times c + a \times d + b \times c + b \times d = ac + ad + bc + bd$

[Video 14 - https://tinyurl.com/ycptvous](https://tinyurl.com/ycptvous)

To **factorise** expressions we reverse the expansion of brackets. We do this by dividing through by the **HCF** (highest common factor) and putting the HCF as the multiplier outside the brackets. Eg)  $5a + 10b = 5(a + 2b)$

[Video 117 - https://tinyurl.com/zymmfev](https://tinyurl.com/zymmfev)

To rearrange an equation (or inequality), always do the same to both sides of the equation and use the opposite operator to remove a term. Eg)  $a + 2b = c$  [- a]

$$2b = c - a \quad [\div 2]$$

$$b = \frac{c - a}{2}$$

We use this to change the subject of a formula.

[Video 110 - https://tinyurl.com/y866296z](https://tinyurl.com/y866296z)