

# Mathematics

Level 2 Order of calculations

## Order of calculations

What is the answer to the following sum?

$$3 + 2 \times 5$$

If you do the sum in the order it's shown, the answer is **25**. But, the calculator on your mobile phone might tell you the answer is **13**.

This is because your calculator does calculations that include two or more different operators (+, -,  $\times$  or  $\div$ ) in a certain order. For instance, it does multiplication before it does addition, so in the example:

$$2 \times 5 = 10 \text{ and } 10 + 3 = 13$$

Because the order in which you carry out a calculation can affect the answer, there is a proper order for doing calculations. It is known as **BIDMAS**.

<b>B</b>	Brackets	Do anything inside brackets first.
<b>I</b>	Indices*	Do powers – like $2^2$ and $10^3$ – next.
<b>D</b>	Division	Next do any division or multiplication. Do them in the order they appear.
<b>M</b>	Multiplication	
<b>A</b>	Addition	Lastly, do any addition or subtraction. Do them in the order they appear.
<b>S</b>	Subtraction	

\* 'Indices' refers to powers (where you multiply a number by itself). Sometimes it is called 'Orders', which gives BODMAS instead of BIDMAS. It means the same thing and this is how it is referred to in your online learning.



Many calculators use BIDMAS, but some do not. You can check by doing a simple calculation, like  $2 + 2 \times 2$ :

If your calculator uses BIDMAS, the answer will be 6.  
If it does not use BIDMAS, the answer will be 8.

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## Examples using BIDMAS

**Calculate the perimeter of a rectangle**

$$P = 2 \times (l + w)$$

**P** = perimeter

**l** = length

**w** = width

What is the perimeter of a rectangle 13cm long and 8cm wide?

$$2 \times (13 + 8)$$

$$2 \times 21$$

$$42\text{cm}$$

**Calculate the area of a circle**

$$A = \pi \times r^2$$

**A** = area

$\pi$  = 3.14

**r** = radius

What is the area of a circle with a radius of 2.5m?

$$3.14 \times 2.5^2$$

$$3.14 \times 6.25$$

$$19.625\text{m}^2$$

**Convert Fahrenheit to Celsius**

$$C = (F - 32) \times 5 \div 9$$

**C** = degrees Celsius

**F** = degrees Fahrenheit

What is 68°F in Celsius?

$$(68 - 32) \times 5 \div 9$$

$$36 \times 5 \div 9$$

$$180 \div 9$$

$$20^\circ\text{C}$$