BODMAS

A couple of secrets to understanding calculations, one of them is remembering the acronym BODMAS

B O D M A S

If you remember "BODMAS" you will not go far wrong with the order of calculations … so many people forget BODMAS and have difficulty with the end result.

Remember "BODMAS" and the meaning of each letter will soon come to memory – because you know the order and just need to remember the words.

BODMAS means:

B	O	D M	A S
Brackets Calculate inside brackets first from left to right	**Orders** Power or square root	**Division and Multiplication** From left to right, whichever comes first, calculate division and multiplication prior to next step	**Addition and Subtraction** From left to right, whichever comes first, calculate addition and subtraction

B is for Brackets

Start with anything inside brackets, from left to right.

Example: 10 x (2 + 5)

2 + 5 = 7
10 x 7 = 70

So, the 2 plus 5 equals 7, then 10 multiplied by 7 equals 70

If the brackets had not been calculated first and the sum was calculated 10 multiplied by 2 equals 20 plus 5 we would come to the incorrect total of 25

O is for Orders

Anything with power or square root.

Power would be identified as 10^2 (10 to the power of 2, otherwise 10 squared)

Square root would be identified as 9_2 (square root of 9)

Example: 3^2 + 40

3 x 3 = 9
9 + 40 = 49

So, the 3 squared equals 9, then add 40 equals 49

Again, working from left to right if you have more than one set of orders. Then it is next for BODMAS working left to right.

D is for Division

M is for Multiplication

Division and Multiplication … both rank equally and is whatever comes first when working left to right.

Example: 5 x 3 + 14 ÷ 7

First 5 x 3 = 15
Then 14 ÷ 7 = 2
Then using the 15 from the first multiplication, we have 15 + 2 = 17

So, the 5 multiplied by 3 equals 15, then 14 divided by 7 equals 2.
Then the two are added together, the 15 plus 2 equals 17.

If we did not use BODMAS, the incorrect calculation based upon straight left to right would provide the incorrect answer of 4.143

As you can see, BODMAS is very important, otherwise completely different answers (and incorrect they would be!)

We should take note once again, the Division and Multiplication are equally important and it is whichever one comes first reading from left to right. Then we can continue with the balance of BODMAS.

A is for Addition

S is for Subtraction

Addition and Subtraction … both rank equally and is whatever comes first when working left to right.

Example: 6 + 4 – 3 + 5

The balance of any BODMAS and remembering they are equally important, we calculate from left to right without any priority between addition and subtraction.

So, 6 + 4 = 10

Then, the 10 – 3 = 7

Then, the 7 + 5 = 12

Had we had other BODMAS priorities such as the following example, it would be BODMAS as previously explained:

Example: 6 + (5 x 10) – 20 + 90 ÷ 9 + 4

Brackets: 5 x 10 = 50
Orders: none
Division and Multiplication (left to right): 90 ÷ 9 = 10
Addition and Subtraction: 6 + 50 equals 56, then the 56 - 20 equals 36, plus the already calculated 10 equals 46, then lastly the 46 plus 4 equals 50

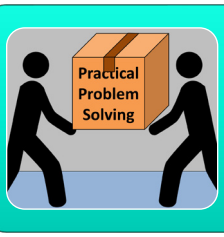
Purpose and use of BODMAS

Avoid Ambiguity

- Mathematical expressions can be interpreted in multiple ways if an order or process is not defined.
- BODMAS removes this ambiguity by providing a standard sequence to follow.

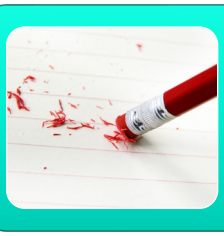
Ensures Consistency

- By following BODMAS, everone arriving at the same answer for a given problem.
- Guarantees uniformity in mathematical calculations.



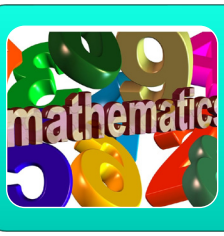
Solves Complex Problems

- BODMAS helps with efficiency.
- Solving multifaceted calculations.



Prevents Mistakes

- Skipping BODMAS can easily lead to incorrect answers..
- Following the strict rules reduces simple or common mistakes in calculations.



Builds Mathematical Foundations

- BODMAS being applied is a foundational knowledge for progressing with mathematics, algebra, higher level.
- Solving multifaceted calculations.

Teaches Logical Thinking

- Encourages step-by-step logical thinking.
- Crucial not onlyu in mathematics but also in daily problem-solving.

Practice some of the following sums using BODMAS ensuring you show your calculations to ensure BODMAS can be checked and answers are correct.

Exercise for BODMAS calculations

Question 1:

7 + 50 × 3

Calculations for each step:

The final answer is:

Question 2:

88 - 50 ÷ (8 + 2)

Calculations for each step:

The final answer is:

Question 3:

23 + 7 × (1 + 9)

Calculations for each step:

The final answer is:

Question 4:

$10 \times (2 + 3) + 5^2$

Calculations for each step:

The final answer is:

Question 5:

$(205 + 307) - 550 \div 5^2 + 1230$

Calculations for each step:

The final answer is:

Answers to the BODMAS exercise

Question 1:

7 + 50 × 3

There are no brackets or orders in this sum.

1) Multiplication comes before addition, so you start with 50 × 3 = 150.
2) Your sum now reads 7 + 150

The answer is therefore **157**

Question 2:

88 - 50 ÷ (8 + 2)

1) Start with brackets. (8 + 2) = 10
2) Your sum now reads 88 - 50 ÷ 10
3) Division comes before subtraction. 50 ÷ 10 = 5
4) Your sum now reads 88 - 5

The answer is therefore **83**

Question 3:

23 + 7 × (1 + 9)

1) Start with brackets. (1+9) = 10
2) Your sum now reads 23 + 7 × 10
3) Multiplication comes before addition. 7 × 10 = 70.
4) Your sum now reads 23 + 70.

The answer is therefore **93**

Question 4:

$10 \times (2 + 3) + 5^2$

1) You need to do the brackets first: (2 + 3) = 5.
2) That gives you $10 \times 5 + 5^2$.
3) The next step is orders, in this case, the square. $5^2 = 5 \times 5 = 25$. Now you have $10 \times 5 + 25$.
4) Division and multiplication come before addition and subtraction, so your next step is $10 \times 5 = 50$. Your sum now reads $50 + 25 = 75$.

The answer is **75**

Question 5:

$(205 + 307) - 550 \div 5^2 + 1230$

This one has everything!

BODMAS must still apply, and all you have to do is step by step for the sum to calculate up the grand total from each step at the end.

1) Start with brackets. (205 + 307) = 512.
2) Your sum now reads $512 - 550 \div 5^2 + 1230$
3) Next, orders or powers. In this case, that's $5^2 = 25$.
4) The sum now reads $512 - 550 \div 25 + 1230$
5) Next, division and multiplication. There is no multiplication, but the division is $550 \div 25 = 22$.
6) Your sum now reads $512 - 22 + 1230$.
7) Although you still have two operations left, addition and subtraction rank equally, you go from left to right. $512 - 22 = 490$, and $490 + 1230 = 1720$.

The answer is **1,720**

Well done!!!

So, what does the acronym BODMAS stand for?