Order of operations

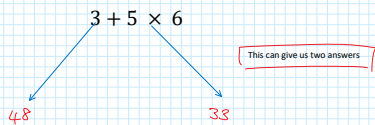⭐ By the end of teaching all students will be asked to complete the following work:

Year 7 Textbook
Chapter 1
Exercise 1I
Questions: 4esq, 5, 7, 8, 9, 11
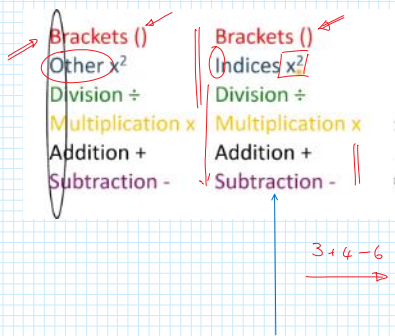
BIDMAS/BODMAS

The way a question is laid out can lead to us getting different answers.
Hence, we need to make sure we are consistent in the way we do operations in Mathematics.
We use a set of "rules" to help us decide which is the best way to answer a question.
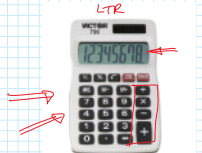
Consider the following question:

$$3 + 5 \times 6$$

This can give us two answers

48   33

$\overline{3 + 5 \times 6}$ $8 \times 6 = 48$

LTR

Which one is correct?
Well, actually, both of them!
If we put the sum into a four function calculator then the answer will be **48**.
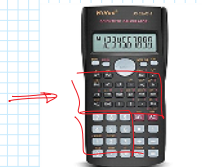If we put the answer into a scientific calculator, it operates under a set of rules which would give the answer as **33**

The Scientific calculator uses the following rules:

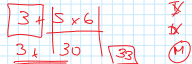|	
Brackets ()	Brackets ()
Other x^2	Indices x^2
Division ÷	Division ÷
Multiplication x	Multiplication x
Addition +	Addition +
Subtraction -	Subtraction -

This was the height of technology when I was a kid!!! Everyone wanted one!

$3 + 4 - 6$

This calculator was magic!!
Well, when we first got one that was ...

I prefer this one!

Using this means we would always get the answer 33.

We must now make sure we use BIDMAS when answering questions!

$3 +$	5×6
$3 +$	30

33 Ⓜ

B I D M A S

Questions which use BIDMAS

Are the following statements TRUE or FALSE?

$10 + 1$ $10 + 1$
① $5 \times 2 + 1 = (5 \times 2) + 1$ T

10×7 $30 + 4$
② $10 \times (3 + 4) = \boxed{10 \times 3} + 4$ F $70 \neq 34$

$21 - 1$ $14 \div 7$
③ $21 - \boxed{7 \div 7} = (21 - 7) \div 7$ F $20 \neq 2$

$9 - 6$ $9 - 6$
④ $9 - \boxed{3 \times 2} = 9 - (3 \times 2)$ T $3 = 3$

Brackets inside brackets?!

It's always awesome in Mathematics when we can do brackets inside brackets.
The rules of BIDMAS say we must do the brackets first.
So, we do the inner most brackets, and work out ...

Example:

$3 \times [(3 + 5) \times 4 - 1]$
$3 \times [(3+5) \times 4 - 1]$
$3 \times [\ 8 \times 4 - 1\ ]$
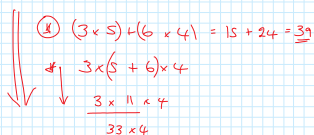$3 \times 31 = 93$

$3FT$

$[(\ )]$
$(((\quad)))$

Doing things backwards

What we can do in Mathematics forwards, we can also do backwards.
Many times we are given questions where we are given the answers, and have to make up the question.
Or, we have to make the question fit the answer we are given.
This topic is great for these backwards styles of questions.

Example: Put brackets into the following question to make the equation correct:

FORWARD
BACKWARD

① $(3 \times 5) + (6 \times 4) = 39$

$3 \times (5 + 6) \times 4 = 132$

① $(3 \times 5) + (6 \times 4) = 15 + 24 = 39$
② $3 \times (5 + 6) \times 4$
   $3 \times 11 \times 4$
   33×4

As you can see, there are three different places we can put the brackets!
There is no "easy" way to see where the brackets need to be, so we have trial and error.