Conventions for working out expressions BODMAS

For the next two pages you need 2 types of calculator - an ordinary one and a scientific calculator.

It is very important that when you are faced with a series of sums in a line that they are calculated in the correct order. Believe it or not this may not be the order that they come!   Look below:

Work out the answer to 3 + 5 x 5 =

Is there a possibility of more than one correct answer?

Try a scientific calculator and see what answer you get.

Try an ordinary calculator and see what answer you get.

Can you write why you think the calculators come up with two different answers?

Huh! Who said calculators gave you the right answer!

To get the answer 40 the addition is done first, followed by the multiplication.
To get the answer 28 the multiplication is done first followed by the addition.
Which is correct?   Good question!
Try these sums on the two different calculators:

1. 3 + 3 x 4 =   or   **2.** 20 – 6 x 2 =   or

3. 6 x 6 + 4 =   or   **4.** 48 – 12 ÷ 4 =   or

Can you see what the scientific calculator is doing?

If a long sum (or expression) has no brackets, like 3 + 5 x 5 =   it has been agreed by mathematicians that the multiplying would be worked out before the addition, even if it does not appear first in the sum.

If a sum has a bracket as part of it, such as 4 x (5 + 4) = then it has been agreed that the part inside the brackets will be calculated first.

 There is an easy way to remember this: BODMAS

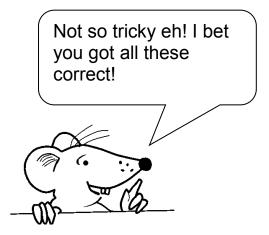|	
Brackets **O**f **D**ivision **M**ultiplication **A**ddition **S**ubtraction	Any sum in brackets is calculated first. Division and multiplication are calculated before addition and subtraction.

Try these to get the idea!

1.   6 + 4 x 2 =

2.   4 + 4 ÷ 2 =

3.   8 + 6 – 3 =

4.   5 + 5 x 4 =

5.   12 + 3 x 2 =

6.   2 x 4 + 5 =

Not as hard as I thought!
I can have a break now!

Remember BODMAS. Any calculations inside brackets must be completed before any other part of the sequence.

Without using a calculator work out the answers to the following sequences:

1. $100 - (20 \times 3) =$

2. $(35 - 15) + (27 - 7) =$

3. $15 + (6 \times 6) =$

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

5. $(5 + 5) \times (5 - 2) =$

6. $50 - (6 \times 6) =$

7. $(4 + 8) \times (3 - 2) =$

8. $(9 - 3) + (6 \times 6) =$

9. $(5 \times 7) - (2 \times 5) =$

10. $56 - (4 \times 7) =$

11. $78 - (10 \times 7) =$

12. $(7 \times 7) + (4 \times 8) =$

13. $(45 - 23) + (5 \times 8) =$

14. $38 - (5 \times 7) =$

15. $(100 - 45) + (7 \times 7) =$

16. $45 - (9 \times 4) =$

Not so tricky eh! I bet you got all these correct!

Just a couple of trickier problems.
By putting in brackets in different places, how many different sums and answers can you find for these two sequences:

1. $4 + 4 \times 5 - 3 =$

2. $8 + 5 \times 1 + 3 - 6 =$

Remember BODMAS shows you the order in which operations should be carried out.

What is the value of ;

1. (4 x 2) + (3 x 3) =   2. (4 x 4) + (5 x 5) =

3. (6 x 6) – (4 x 4) =   4. (9 x 9) – (8 x 8) =

5. 18 – (4 x 2) =   6. 4 x (4 – 2) =

7. 18 – (9 x 4) + 32 =   8. (12 x 12) – (11 x 12) =

9.   30 – (5 x 4) =   10. 67 – (9 x 5) =

11. (8 + 6) x 4 =   12. 8 x 7 – 3 =

13. (4 x 9) – (4 x 8) =   14. 56 – (5 x 9) =

15.   72 – (8 x 7) + 9 =   16. (9 x 8) + (9 x 8) =

Wow! I bet you got most of these right as well.
Getting easy aren't they!
Try finding a sequence that will give the same answer if you put the brackets in two different places.

Remember BODMAS shows you the order in which operations should be carried out.

Write the following sums out without changing the order of the numbers. To make the sums correct put in the brackets if necessary to show which part has to be completed first.
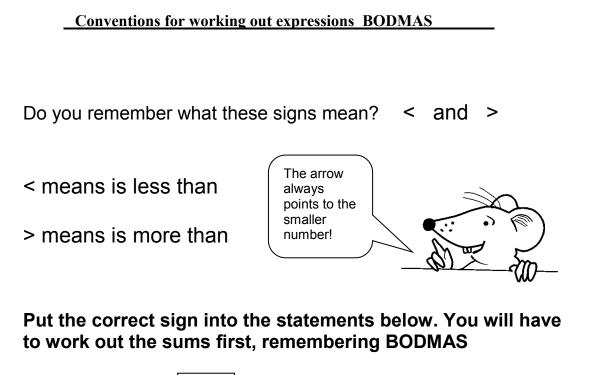
8 + 4 x 6 – 5   =   27

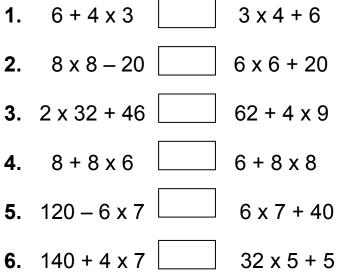8 + 4 x 6 – 5   =   12

8 + 4 x 6 – 5   =   67

You can see the need for a rule on this otherwise everyone would be doing sums in different ways and getting different answers!

Put in the signs and/or brackets to make the following true:

1.	4	4	3	=	16	**6.**	4	6	4	=	20
2.	7	6	11	=	12	**7.**	10	3	5	=	35
3.	2	2	4	=	8	**8.**	2	4	6	=	1
4.	2	2	4	=	16	**9.**	24	2	4	=	8
5.	4	3	3	=	13	**10.**	5	4	4	=	21

Ah ha! I bet you didn't find these quite as easy! You did?   Great!

Do you remember what these signs mean?   <   and   >

< means is less than

> means is more than

The arrow always points to the smaller number!

Put the correct sign into the statements below. You will have to work out the sums first, remembering BODMAS

1.   6 + 4 x 3   [   ]   3 x 4 + 6

2.   8 x 8 – 20   [   ]   6 x 6 + 20

3. 2 x 32 + 46   [   ]   62 + 4 x 9

4.   8 + 8 x 6   [   ]   6 + 8 x 8

5. 120 – 6 x 7   [   ]   6 x 7 + 40

6. 140 + 4 x 7   [   ]   32 x 5 + 5

Investigate: Using only these numbers and signs make a statement or expression which will give you the biggest possible answer:

8 + 7 – 6   x   4   and one set of brackets.

SPEED CHECK: USING THE CORRECT SEQUENCE OF OPERATIONS

Time yourself on these questions to see how long it takes. Remember to work out the answer in the right order (BODMAS)

1. $9 \times (4 + 4) =$ **2.** $8 \times (3 + 8) =$ **3.** $5 \times (6 + 3) =$

4. $8 + 24 \div 4 =$ **5.** $7 + 63 \div 9 =$ **6.** $5 + 21 \div 7 =$

7. $(4 + 7) \times 3 =$ **8.** $(5 + 3) \times 6 =$ **9.** $(7 + 2) \times 8 =$

10. $12 \div (2 + 4) =$ **11.** $24 \div (7 + 5) =$

12. $45 \div (4 + 5) =$ **13.** $63 \div (17 - 8) =$

14. $4 + 5 \times 9 =$ **15.** $8 + 8 \times 8 =$ **16.** $7 + 7 \times 7 =$

17. $6 + 6 \times 6 =$ **18.** $9 + 9 \times 9 =$ **19.** $81 - 4 \times 4 =$

20. $(18 + 15) - (13 + 12) =$

How long did you take?

Did you get them all correct?

SPEED CHECK: USING THE CORRECT SEQUENCE OF
OPERATIONS

Time yourself on these questions to see how long it takes.
Remember to work out the answer in the right order
(BODMAS).

1. 8 x (5 + 4) =   **2.** 7 x (4 + 8) =   **3.** 6 x (6+ 4) =

4. 7 + 28 ÷ 4 =   **5.** 6 + 72 ÷ 9 =   **6.** 4 + 28 ÷ 7 =

7. (3 + 8) x 5 =   **8.** (6 + 4) x 8 =   **9.** (9 + 2) x 7 =

10. 32 ÷ (4 + 4) =   **11.** 18 ÷ (7 + 2) =

12. 54 ÷ (4 + 5) =   **13.** 48 ÷ (14 − 8) =

Even speedier!!

14. 5 + 5 x 8 =   **15.** 6 + 7 x 8 =   **16.**   8 + 9 x 6 =

17. 4 + 6 x 7 =   **18.** 3 + 4 x 5 =   **19.**   64 − 4 x 4 =

20. (19 + 13) − (14 + 15) =

How long did you take? If this was your second go, did you
beat your first time?

Did you get them all correct?