Order of Operations

It's important that everyone does maths in the same way. The agreed order is called BIDMAS. (You may also hear other names such as BODMAS or PEMDAS.)

B	**B**rackets	$10 \times (4 + 2) = 10 \times 6 = 60$
I	**I**ndices	$5 + 2^2 = 5 + 4 = 9$
D	**D**ivision	$10 + 6 \div 2 = 10 + 3 = 13$
M	**M**ultiplication	$10 - 4 \times 2 = 10 - 8 = 2$
A	**A**ddition	$10 \times 4 + 7 = 40 + 7 = 47$
S	**S**ubtraction	$10 \div 2 - 3 = 5 - 3 = 2$

Multiplication and division have equal priority; addition and subtraction have equal priority. Where multiplication and division both occur in the same calculation, perform these from left to right. Where addition and subtraction both appear in the same calculation, perform these from left to right. It is also very important that you follow the rules for carrying out the four operations with negative numbers.

Example 1	**Example 2**
Find the value of $5 \times 3 + 2$. The first step is to calculate the multiplication, followed by the addition. It may help to write out your working for each stage: $5 \times 3 + 2$ $= 15 + 2$ $= 17$ $5 \times 3 + 2 = 17$	Find the value of $16 \div (6 + 2) + 7$. Begin by working out the sum inside the brackets. $6 + 2 = 8$ $16 \div 8 + 7$ Now, complete the division: $16 \div 8 + 7$ $= 2 + 7$ Finally, perform the addition: $2 + 7 = 9$ $16 \div (6 + 2) + 7 = 9$

Example 3

Work out the value of $4 + 2 \times -6$.

This time, there is a negative number in the calculation so we need to be careful and follow the rule for addition of negative numbers.
By applying the rules of BIDMAS, we must start by calculating the multiplication, followed by the addition.
$4 + 2 \times -6$
$= 4 + -12$

By applying what we know about adding and subtracting negative numbers, this becomes:
$4 - 12 = -8$

$4 + 2 \times -6 = -8$

Your Turn

Work out the value for each of the following:

1. $5 + 8 \times 2$

8. $(20 + 3) \div 2 + 3$

2. $18 - 4 \div 2$

9. $(3 + 6) \times (-2)^2$

3. $25 + 5 \times 6$

10. $(20 - 4) \div 2^3$

4. $30 - 12 \div -3$

11. $8 - 5 \times 3^3$

5. $-6 \times 4 - 2 \times 3$

12. $4 + 5^2 \times -4$

6. $2 \times 11 + 7 \times -3$

13. $(20 - 5^2) \times 3$

7. $(3 + 3) \div 2$

14. $5 \times (4 + 5)^2$

15. $24 \div 2^2 \times \sqrt{16}$

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16. Explain why the answer to 10 + 3 × 5 is 25 and not 65.

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Challenge

Place brackets into the following question to make it correct.

$\sqrt{64} + 6 \div -2 \times -2 = 9.5$

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