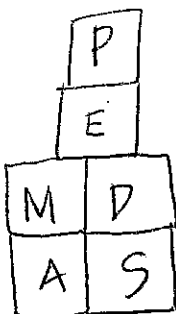




Order of Operations

Drivers are given "rules of the road" that govern how they drive. These rules include stopping at red lights and at stop signs, yielding to oncoming traffic when making a left turn, and so on.

In math, there are also "rules of the road." These rules govern the order in which numbers are computed. They are called the *order of operations*. When you must solve a long string of computations, the order of operations tells you what should receive your attention first.



The Order of Operations

- P**arentheses
- E**xponents
- M**ultiplication and
- D**ivision
- A**ddition and
- S**ubtraction

Some people use a memory aid to remember the order of operations. Using the first letter of each word above, the following sentence was created:

Please **E**xcuse **M**y **D**ear **A**unt **S**ally.

It may be easier to remember this sentence than to remember the order of operations. Using the first letter of each word, you can recall the words they represent.





Order of Operations (continued)

Put the order of operations to use. Below is an example that includes every step in the order of operations. It shows how you can work through a long number sentence following the "rules of the road."

$$7^2 - (15 + 22) + 16 \div 2 \times 6 =$$

P - Parentheses

$$7^2 - 37 + 16 \div 2 \times 6 =$$

E - Exponents ($7^2 = 7 \times 7$)

$$49 - 37 + 16 \div 2 \times 6 =$$

M - Multiplication and

D - Division

(Solve from left to right.)

$$49 - 37 + 8 \times 6 =$$

$$49 - 37 + 48 =$$

A - Addition and

S - Subtraction

(Solve from left to right.)

$$12 + 48 =$$

60

Without following the order of operations, the example problem could be solved differently and a different answer could be found. For example, if all the multiplication and exponents were done first, you would get the following number sentence:

$$49 - (15 + 22) + 16 \div 12 =$$

Then, solving from left to right, the following solution would be found:

$$49 - 37 + 16 \div 12 =$$

$$28 \div 12 =$$

$$2\frac{1}{3}$$

It is very important that everyone follow the same "rules of the road." Otherwise, one number sentence could have several different answers. Following the order of operations, there is only one possible solution.