Order of Operations on the ISEE

All Levels

LESSON GOAL: Be able to solve any arithmetic expression in one minute or less.

ISEE Question: What does $1 + (2^3 \div 4) \times 5 - 6(7 + 8) \div 9$ equal?

Solution: Although it looks slightly horrifying at first sight, this problem will not take too much time, if you apply ***the order of operations***. Remember the acronym ***PEMDAS***, which stands for ***P***arentheses, ***E***xponents, ***M***ultiplication, ***D***ivision, ***A***ddition, and ***S***ubtraction. Do the steps in that order!

STEP 1: We need solve what's inside the ***parentheses***.

Inside the first set of parentheses, we will do the exponent first, since ***E*** is before ***D*** in ***PEMDAS***.	$(2^3 \div 4) =$
Then we take care of the division.	$(8 \div 4) = 2$
The second set of parentheses needs simple addition.	$(7 + 8) = 15$
STEP 2: Since there are no more exponents to worry about, the next step is ***Multiplication*** ($2 \times 5 = 10$ and $6 \times 15 = 90$),	$1 + (2) \times 5 - 6(15) \div 9$ $1 + 10 - 90 \div 9$
and the following one, ***Division*** ($90 \div 9 = 10$).	$1 + 10 - 10$
STEP 3: Next, we have to do the ***Addition*** ($1 + 10 = 11$), and, finally, the ***Subtraction*** ($11 - 10 = 1$).	$11 - 10$ 1

Helpful Tip: As you solve directly in your ISEE exam booklet, it helps to keep the numbers and symbols aligned vertically, so you don't loose track of what you have done already and what you have to do still:

$$
\begin{aligned}
1+ (2^3 \div 4) \times 5 - 6(7 + 8) \div 9 \\
1 + (8 \div 4) \times 5 - 6(7 + 8) \div 9 \\
1 + (2) \times 5 - 6 \times (15) \div 9 \\
1 + 10 - 90 \div 9 \\
1 + 10 - 10 \\
11 - 10 \\
1
\end{aligned}
$$

RECAP:
Whenever you have to do several different calculations, follow the order of operations PEMDAS.
Solve directly in your exam booklet, using a separate line for each step.
Line up your numbers, so you don't miss anything.