



CSE REVIEWER · STUDY GUIDE

Numerical Ability

Operations · Problem Solving · Patterns, Data & Measurement

VOLUME II

A complete, self-contained study guide to the numerical block of the Philippine Civil Service Exam — Professional level.
Built to be the only material you need for this section.

WHAT THIS GUIDE TEACHES

Method first. Speed follows.

The numerical exam rewards a dependable method for every problem type — not raw calculation speed. This guide builds the methods, drills them, and makes the arithmetic underneath them automatic.



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TOPIC 1.1

Order of Operations and Integers

Numerical Ability on the CSE Professional begins with the most basic guarantee of correct arithmetic: doing the right operation at the right time. An expression like $6 + 4 \times 2$ has only one correct answer, and which answer you reach depends entirely on the order in which you work. This topic fixes that order and the rules for working with positive and negative numbers.

These skills look elementary, and they are — but the exam does not test them in isolation. It folds them into longer problems, where a single order-of-operations slip or a dropped negative sign quietly ruins an otherwise correct solution. Getting the foundation automatic is what frees your attention for the harder reasoning later in the section.

Lesson

The order of operations

Every arithmetic expression is evaluated in a fixed sequence. The common memory aid is PEMDAS, but it is easy to misread, so learn what each step actually means.

1. Parentheses (and other grouping symbols — brackets, braces). Work whatever is inside a grouping symbol first, from the innermost outward.
2. Exponents. Apply any powers or roots next.
3. Multiplication and Division — together, left to right. These two share a rank. You do not do all multiplication and then all division; you do whichever comes first as you read from left to right.
4. Addition and Subtraction — together, left to right. The same rule applies: they share a rank, and you work them in the order they appear.

The two ranks that share a level — multiply/divide, and add/subtract — are where most mistakes happen. In $12 - 4 + 3$, subtraction does not 'come before' addition; you simply work left to right: $12 - 4$ is 8, then $8 + 3$ is 11. Reading it as $12 - (4 + 3) = 5$ is a common and costly error.

Working with integers

Integers are the whole numbers together with their negatives and zero. The CSE expects you to add, subtract, multiply, and divide them fluently, including when signs are mixed.



Adding and subtracting signed numbers

- Same signs — add the values and keep the shared sign. $(-7) + (-5) = -12$. Both negative, so the result is negative.
- Different signs — subtract the smaller value from the larger, and keep the sign of the number with the larger value. $(-9) + 4 = -5$, because 9 is larger than 4 and 9 was negative.
- Subtracting is adding the opposite. Rewrite $a - b$ as $a + (-b)$. So $6 - (-3)$ becomes $6 + 3 = 9$ — subtracting a negative adds.

Multiplying and dividing signed numbers

- Two numbers with the SAME sign give a positive result. $(-6) \times (-4) = 24$, and $(-20) \div (-5) = 4$.
- Two numbers with DIFFERENT signs give a negative result. $(-6) \times 4 = -24$, and $20 \div (-5) = -4$.
- A simple count works for longer products: an even number of negative factors gives a positive result; an odd number gives a negative result.

THE DROPPED NEGATIVE SIGN

More numerical-ability points are lost to a mishandled negative sign than to any genuine difficulty. Before writing each line of a solution, confirm the sign of every term. A correct calculation with the wrong sign is still a wrong answer.

Worked Example 1

Evaluate: $8 + 3 \times (10 - 6)^2 \div 4$

- A. 20
- B. 14
- C. 44
- D. 11

REASONING

1. Parentheses first. The grouping symbol contains $10 - 6$, which is 4. The expression becomes $8 + 3 \times 4^2 \div 4$.
2. Exponents next. 4^2 means 4 squared, which is 16. The expression becomes $8 + 3 \times 16 \div 4$.
3. Multiplication and division, left to right. Reading left to right: 3×16 is 48; then $48 \div 4$ is 12. The expression becomes $8 + 12$.
4. Addition last. $8 + 12 = 20$.



END OF FREE PREVIEW

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