

The Greek Abacus Simulator — User Guide

*Note: the program's interface is in French. Throughout this guide, the exact French label you'll see on screen is given in **bold**, followed by its English translation in parentheses.*

What is this tool for?

This simulator reconstructs a **Greek counting-board abacus** (an ancient tool using loose counters, not beads on wires) to learn how the Greeks and Romans added, subtracted, multiplied and divided — by moving physical tokens rather than manipulating digits.

The abacus: three columns, nine lines

The abacus has **9 horizontal lines**, each tied to a value, from the smallest (at the bottom) to the largest (at the top):

Full line	Space between two lines
1	5
10	50
100	500
1,000	5,000
10,000	—

A token placed on a **line** is worth its full value; a token placed in the **space** just above is worth five times the line below it. Numbers are formed by combining tokens on these lines and spaces (for example, 7 is made of 1 token in the "5" space plus 2 tokens on the "1" line).

The abacus is divided into **three vertical columns**:

- **A** and **B** (colonnes A et B): the two numbers you're working with.
- **C** (colonne C): the working area, where intermediate calculations and the final result are built up.

The two modes: full and simplified

Two tabs in the top-left corner let you choose the display level:

- **Mode complet** ("full mode"): all four operations (addition, subtraction, multiplication, division), the Greek and Roman notation slates, and the "show values" button.

- **Mode simplifié** ("simplified mode"): only addition and subtraction, larger tokens, the value of every line always visible, and a lighter presentation suited to a first discovery of the tool.

Representing a number

There are two ways to place a number in column A or B:

1. **Type the number** into the corresponding field (**Nombre A / Nombre B** — "Number A" / "Number B"), then press *Enter* (or click elsewhere): the tokens appear immediately on the abacus, in their canonical arrangement.
2. **Place the tokens yourself**, directly on the abacus: clicking on a line or a space, on the left half (column A) or right half (column B), adds a token there.

To remove a hand-placed token: click it once to select it (it changes appearance), then click again to remove it — or double-click it directly. This only works as long as no operation is running (free mode).

The four operations

Once A and B are filled in (by typing or by hand), four buttons launch the calculation, animated step by step on the abacus:

- **A + B** — addition
- **A - B** — subtraction (the result must stay zero or positive)
- **A × B** — multiplication
- **A ÷ B** — division (the divisor cannot be zero)

The maximum number you can type into fields A and B is **40,000**. If a calculated result exceeds the abacus's capacity (49,999), a message says so and the operation is not launched.

Following the calculation step by step

Once an operation is launched, the panel below the controls explains each step in French, while the abacus animates.

- The **← Précédent** ("Previous") and **Suivant →** ("Next") buttons let you move forward or backward through the steps, at your own pace.
- The button in the middle switches between **navigation manuelle** ("manual navigation" — you advance yourself) and **lecture automatique** ("automatic playback" — steps follow one another on their own, with a short pause between each). A small text under the step counter always reminds you which mode you're in.
- Every operation starts in manual navigation. Clicking Previous or Next during automatic playback pauses it.
- Some steps (carrying/reducing tokens, or the partial products of a multiplication) break down into several small successive actions. In manual navigation, each of

these is also browsed with Previous/Next; in automatic playback, they play through on their own.

Showing the values

The « **Afficher les valeurs** » button ("Show values", full mode only) displays, next to every line and space of the abacus:

- on the **left**, its value in Arabic numerals (1, 5, 10, 50...);
- on the **right**, the same value in **Greek notation** and **Roman notation**, each in its own column.

In simplified mode, these values are always visible on the left, and only the Roman notation appears on the right.

The Greek and Roman notation slates

To the side, two small panels permanently display (full mode only) the numbers A, B and the result in two ancient scripts:

- **Notation grecque alphabétique** ("Greek alphabetic notation"): each letter of the Greek alphabet stands for a value (A = 1, I = 10, P = 100...).
- **Notation romaine additive** ("Additive Roman notation"): Roman numerals *as they were actually used in Antiquity* — never the simplified subtractive version taught today. For example, 4 is written **IIII** (not IV) and 9 is written **VIII** (not IX). For large numbers, a line above a letter (ↀ, ↁ) multiplies its value by 1000, just as the Romans did.

Starting over

The « **Recommencer** » button ("Start over") clears the abacus, the A and B fields, and returns to the starting state, ready for a new calculation.

Version 0.8.34 du 29.7.2026

Nunc est bibendum