# Compound Interest – Annotated Examples

**Liberal Arts Mathematics**

## Introduction

There is a lot going on in the compound interest formula. It looks complicated and has several steps. Once you learn to focus on working one step at a time, it becomes more manageable. Here are two examples shown step-by-step with the corresponding calculator steps.

## Examples

The following example is Example 6.41 from *Contemporary Mathematics* by Donna Kirk.

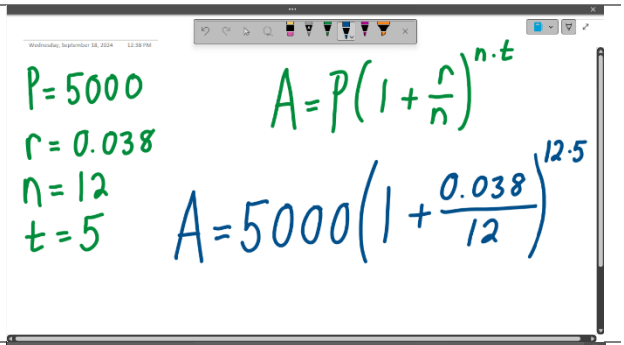
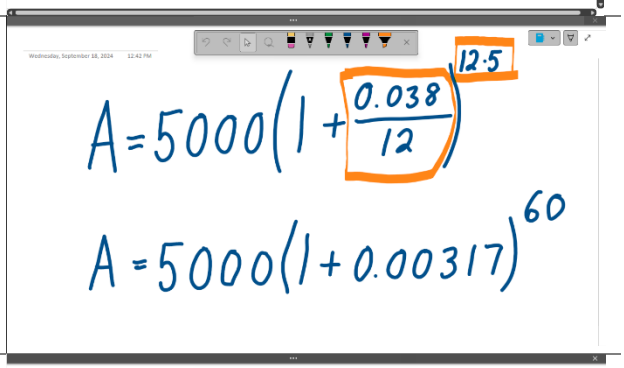
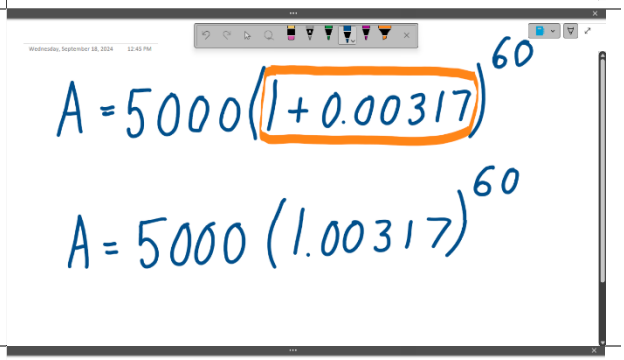
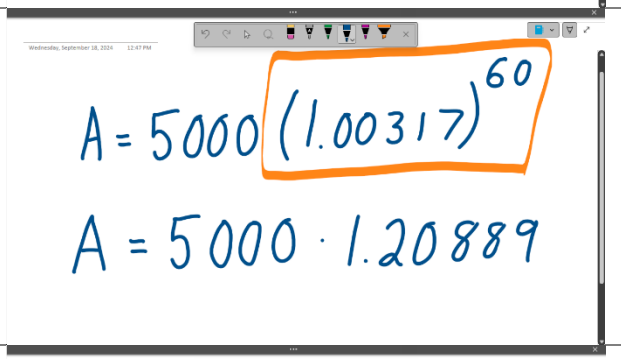
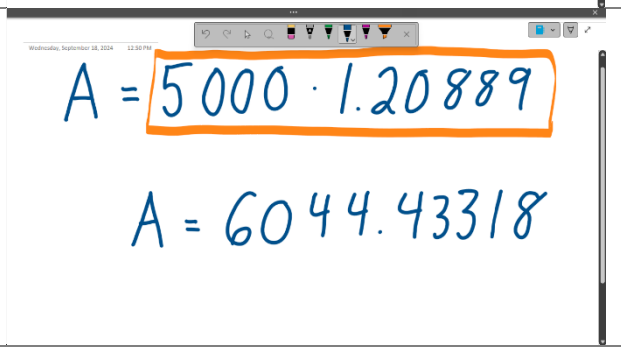
The main tip I suggest to students is to keep your work in your calculator. It is easy to get round-off errors in these problems. I am showing how I type the calculations in the Microsoft Windows calculator. Almost all scientific calculators are similar.

### Example

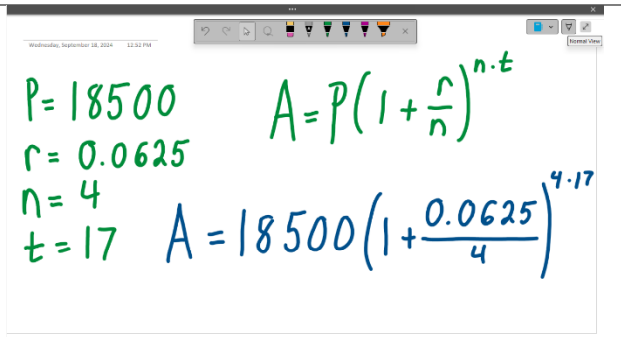
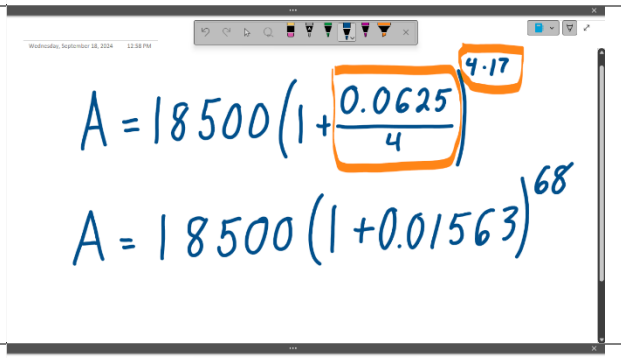
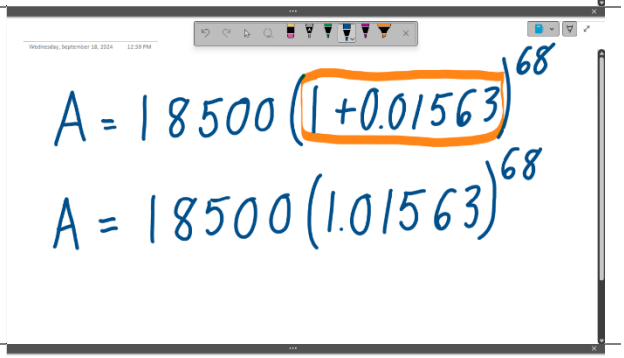
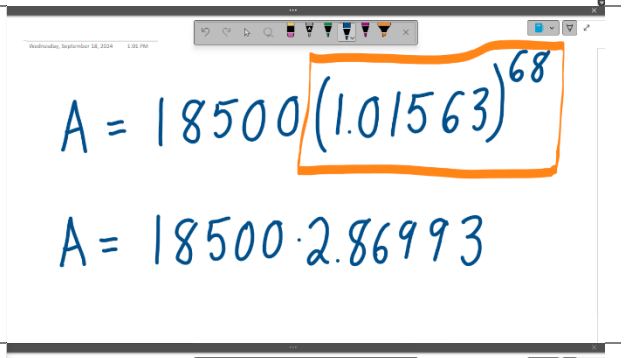
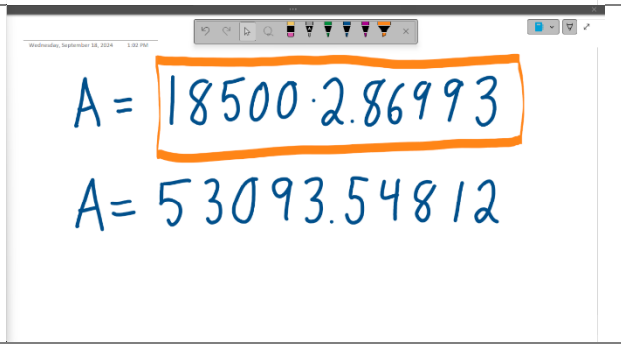
In the following, compute the future value of the investment with the given conditions.

1. Principal is $5,000, annual interest rate is 3.8%, compounded monthly, for 5 years.
2. Principal is $18,500, annual interest rate is 6.25%, compounded quarterly, for 17 years.

## Solution 1

| Step | Calculator | Work |
|---|---|---|
| **Start with the formula** $A = P\left(1 + \frac{r}{n}\right)^{n \cdot t}$ **Substitute the known values** | |   |
| **The first operations are division inside the parentheses and multiplication in the exponent.** |   |   |
| **The second operation is addition inside the parentheses** |   |   |
| **The third operation is the exponent.** **This is where round-off errors start to matter.** |   |   |
| **The fourth and final operation is multiplication.** **The future value is $6,044.43** |   |   |

## Solution 2

| Step | Calculator | Work |
|---|---|---|
| **Start with the formula** $A = P\left(1 + \frac{r}{n}\right)^{n \cdot t}$ **Substitute the known values** | |   |
| **The first operations are division inside the parentheses and multiplication in the exponent.** |   |   |
| **The second operation is addition inside the parentheses** |   |   |
| **The third operation is the exponent.** **This is where round-off errors start to matter.** |   |   |
| **The fourth and final operation is multiplication.** **The future value is $53,093.55** |   |   |