

# 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.

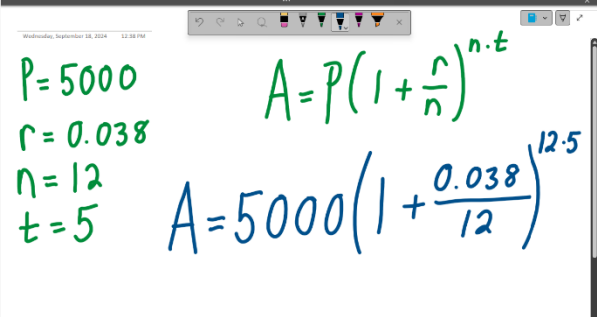

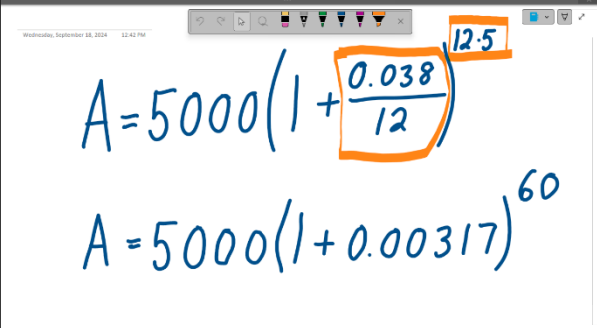

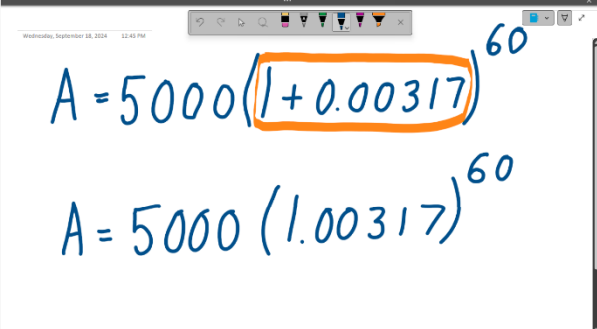

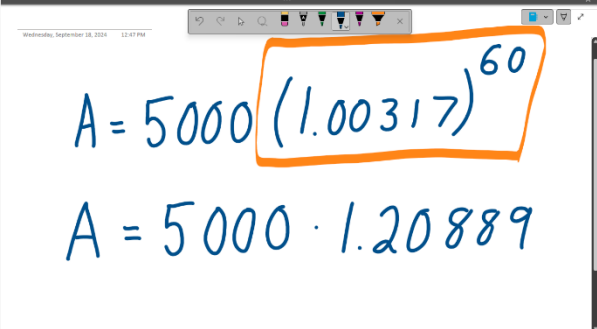

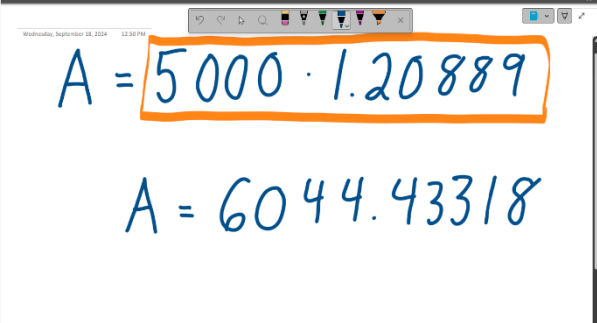
The main tip I suggest to students is to keep your work in your calculator. It is easy to get round-off errors in these problems. I am showing how I type the calculations in the Microsoft Windows calculator. Almost all scientific calculators are similar.

### 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.

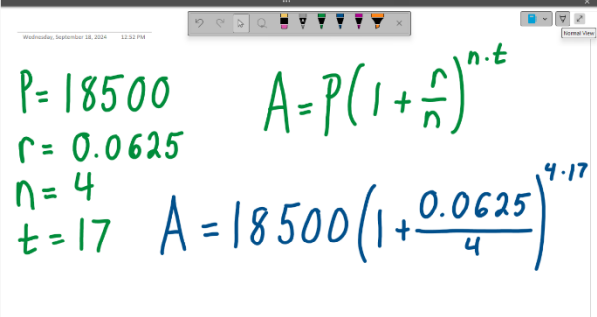

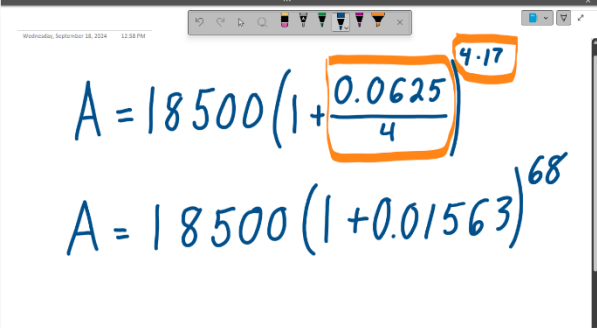

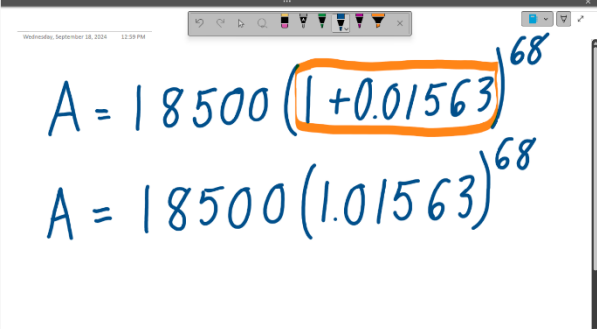

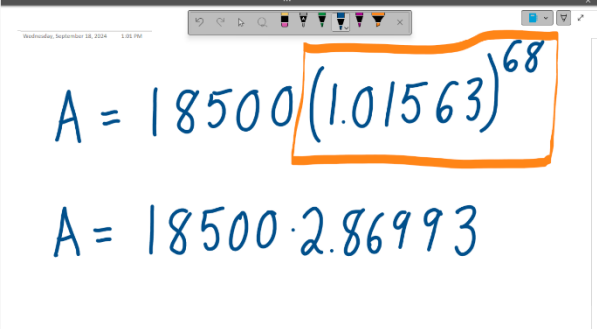

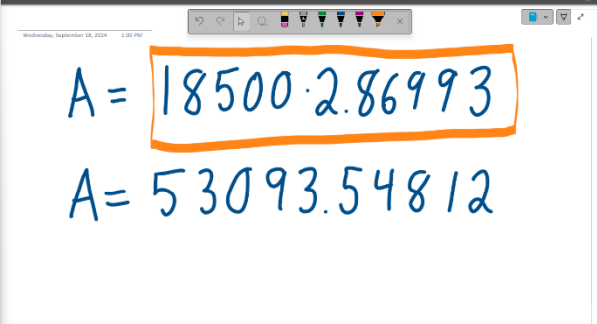
## Solution 1

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

Example from *Contemporary Mathematics* by Donna Kirk. Access for free at <https://openstax.org/books/contemporary-mathematics/pages/1-introduction>

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## Solution 2

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

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