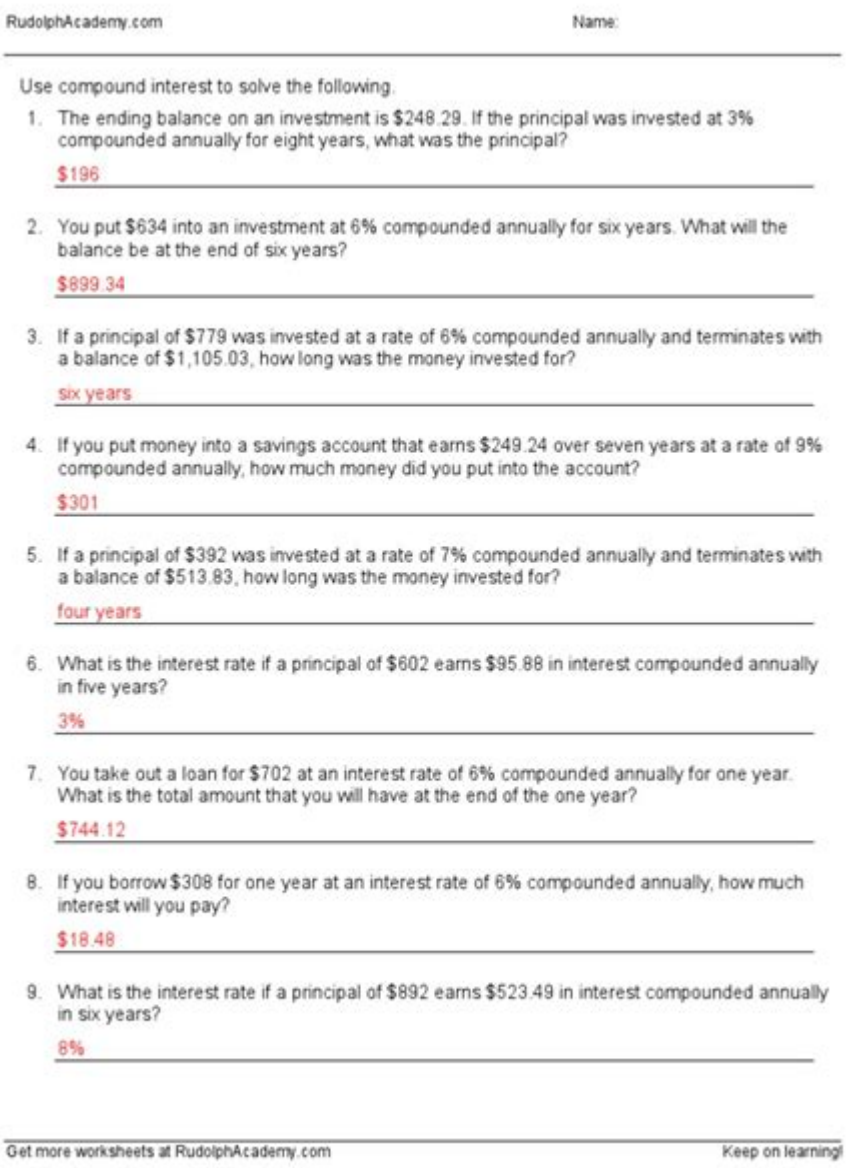
# Compound Interest Worksheet Answer Key



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Use compound interest to solve the following.

1. The ending balance on an investment is $248.29. If the principal was invested at 3% compounded annually for eight years, what was the principal?

   $196

2. You put $634 into an investment at 6% compounded annually for six years. What will the balance be at the end of six years?

   $899.34

3. If a principal of $779 was invested at a rate of 6% compounded annually and terminates with a balance of $1,105.03, how long was the money invested for?

   six years

4. If you put money into a savings account that earns $249.24 over seven years at a rate of 9% compounded annually, how much money did you put into the account?

   $301

5. If a principal of $392 was invested at a rate of 7% compounded annually and terminates with a balance of $513.83, how long was the money invested for?

   four years

6. What is the interest rate if a principal of $602 earns $95.88 in interest compounded annually in five years?

   3%

7. You take out a loan for $702 at an interest rate of 6% compounded annually for one year. What is the total amount that you will have at the end of the one year?

   $744.12

8. If you borrow $308 for one year at an interest rate of 6% compounded annually, how much interest will you pay?

   $18.48

9. What is the interest rate if a principal of $892 earns $523.49 in interest compounded annually in six years?

   6%

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**Compound interest worksheet answer key** serves as an essential resource for students, educators, and anyone interested in understanding how compound interest works. Compound interest is a fundamental concept in finance, allowing individuals to grow their savings or investments over time. By using a worksheet that focuses on compound interest problems, learners can enhance their comprehension of the topic and develop their mathematical skills. In this article, we will explore what compound interest is, how to calculate it, the importance of a compound interest worksheet, and an answer key for various types of problems.

## Understanding Compound Interest

Compound interest refers to the interest that is calculated on the initial principal amount, which also

includes all the accumulated interest from previous periods. This differs from simple interest, where interest is only calculated on the principal amount.

## Formula for Compound Interest

The formula for calculating compound interest is:

$$ A = P \left(1 + \frac{r}{n}\right)^{nt} $$

Where:
- $ A $ = the future value of the investment/loan, including interest
- $ P $ = the principal investment amount (the initial deposit or loan amount)
- $ r $ = the annual interest rate (decimal)
- $ n $ = the number of times that interest is compounded per year
- $ t $ = the number of years the money is invested or borrowed

To find the compound interest earned, you can subtract the principal from the amount:

$$ CI = A - P $$

Where:
- $ CI $ = compound interest

# The Importance of a Compound Interest Worksheet

A compound interest worksheet is a valuable educational tool for several reasons:

1. Practice and Reinforcement: Worksheets provide an opportunity to practice calculations and reinforce understanding of the concept.
2. Real-World Applications: Learning about compound interest is crucial for personal finance, including savings accounts, investments, and loans.
3. Confidence Building: Working through problems helps students gain confidence in their math skills.
4. Preparation for Exams: Worksheets can serve as excellent study materials for exams that cover financial concepts.

## Types of Problems on a Compound Interest Worksheet

A well-designed compound interest worksheet may include various types of problems, such as:

1. Basic Calculation Problems: Simple applications of the compound interest formula.
2. Word Problems: Scenarios involving real-life situations where compound interest is applicable.
3. Comparative Problems: Questions that compare simple interest and compound interest to highlight differences.
4. Graphing Problems: Visual representations of how investments grow over time with compound interest.

# Sample Problems and Answer Key

To guide learners through the process of calculating compound interest, we will present several sample problems followed by their answers.

## Problem 1: Basic Calculation

Question: Calculate the future value of an investment of $1,000 at an annual interest rate of 5% compounded annually for 3 years.

Solution:
Using the formula:
- $P = 1000$
- $r = 0.05$
- $n = 1$
- $t = 3$

$$A = 1000 \left(1 + \frac{0.05}{1}\right)^{1 \times 3}$$
$$A = 1000 (1.05)^3$$
$$A = 1000 \times 1.157625$$
$$A \approx 1157.63$$

Answer: The future value is approximately $1,157.63.

## Problem 2: Compound Interest Calculation

Question: What is the compound interest earned on an investment of $2,500 at an annual interest rate of 4% compounded quarterly for 5 years?

Solution:
- $P = 2500$
- $r = 0.04$
- $n = 4$
- $t = 5$

$$A = 2500 \left(1 + \frac{0.04}{4}\right)^{4 \times 5}$$
$$A = 2500 \left(1 + 0.01\right)^{20}$$
$$A = 2500 (1.01)^{20}$$
$$A \approx 2500 \times 1.22019$$
$$A \approx 3050.47$$

To find the compound interest:
$$CI = A - P = 3050.47 - 2500$$
$$CI \approx 550.47$$

Answer: The compound interest earned is approximately $550.47.

## Problem 3: Word Problem

Question: Sarah invests $5,000 in an account that offers an annual interest rate of 6% compounded monthly. How much will she have in the account after 10 years?

Solution:
- $P = 5000$
- $r = 0.06$
- $n = 12$
- $t = 10$

$$A = 5000 \left(1 + \frac{0.06}{12}\right)^{12 \times 10}$$
$$A = 5000 \left(1 + 0.005\right)^{120}$$
$$A = 5000 (1.005)^{120}$$
$$A \approx 5000 \times 1.7137$$
$$A \approx 8568.50$$

Answer: Sarah will have approximately $8,568.50 in the account after 10 years.

## Problem 4: Comparing Simple Interest and Compound Interest

Question: If a person invests $1,000 at an annual interest rate of 3% for 4 years, calculate both simple interest and compound interest (compounded annually) and compare the two.

Solution:

1. Simple Interest Calculation:
$$SI = P \times r \times t$$
$$SI = 1000 \times 0.03 \times 4 = 120$$

So, the total amount with simple interest will be:
$$A_{SI} = P + SI = 1000 + 120 = 1120$$

2. Compound Interest Calculation:
$$A = 1000 \left(1 + 0.03\right)^{4}$$
$$A = 1000 (1.03)^{4}$$
$$A \approx 1000 \times 1.1255$$
$$A \approx 1125.50$$

The compound interest earned:
$$CI = A - P = 1125.50 - 1000 = 125.50$$

Answer:
- Simple Interest: $120; Total Amount: $1,120
- Compound Interest: $125.50; Total Amount: $1,125.50

# Conclusion

A compound interest worksheet answer key is an invaluable tool for mastering the concept of compound interest. By practicing various problems, students can enhance their financial literacy and understand how investments grow over time. The examples provided in this article illustrate the calculation of compound interest in different contexts, allowing readers to see the practical application of these mathematical principles. Whether for classroom use or personal study, engaging with compound interest worksheets can lead to a clearer understanding of vital financial concepts that impact everyday life.

# Frequently Asked Questions

## What is a compound interest worksheet used for?

A compound interest worksheet is used to help students or individuals practice calculating compound interest on various principal amounts, interest rates, and time periods.

## How do you calculate compound interest?

Compound interest is calculated using the formula A = P(1 + r/n)^(nt), where A is the amount of money accumulated after n years, P is the principal amount, r is the annual interest rate, n is the number of times interest is compounded per year, and t is the number of years.

## What should be included in a compound interest worksheet answer key?

A compound interest worksheet answer key should include the correct answers to the problems presented in the worksheet, showing the final amounts after interest is applied for different scenarios.

## Why is understanding compound interest important?

Understanding compound interest is crucial because it affects savings growth, loan repayments, and investment returns, helping individuals make informed financial decisions.

## Can compound interest be applied to different types of investments?

Yes, compound interest can be applied to various types of investments, including savings accounts, certificates of deposit (CDs), stocks, and bonds, each accruing interest over time.

## What are common mistakes made when calculating compound interest?

Common mistakes include miscalculating the number of compounding periods, using incorrect interest rates, and failing to accurately apply the formula, leading to incorrect final amounts.

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