Lesson 10: Simple Interest

Classwork

To find the simple interest, use:

* is the percent of the principal that is paid over a period of time (usually per year).
* is the time.
* and must be compatible. For example, if is an annual interst rate, then must be written in years.

**Example 1: Can Money Grow? A Look at Simple Interest**

Larry invests in a savings plan. The plan pays interest each year on his account balance.

1. How much money will Larry earn in interest after years? After years?
2. How can you find the balance of Larry’s account at the end of years?

Exercise 1

Find the balance of a savings account at the end of years if the interest earned each year is . The principal is .

**Example 2: Time Other Than One Year**

A savings bond earns simple interest at the rate of each year. The interest is paid at the end of every month. How much interest will the bond have earned after months?

Example 3: Solving for ,, or

Mrs. Williams wants to know how long it will take an investment of to earn in interest if the yearly interest rate is paid at the end of each year.

Exercise 2

Write an equation to find the amount of simple interest, , earned on a investment after years, if the semi-annual (-month) interest rate is .

Exercise 3

A loan has an annual interest rate of on the amount borrowed. How much time has elapsed if the interest is now ?

Lesson Summary

* Interest earned over time can be represented by a proportional relationship between time, in years, and interest.
* The simple interest formula is

is the percent of the principal that is paid over a period of time (usually per year)

is the time

* The rate, , and time, , must be compatible. If is the annual interest rate, then must be written in years.

Problem Set

1. Enrique takes out a student loan to pay for his college tuition this year. Find the interest on the loan if he borrowed at an annual interest rate of for years.
2. Your family plans to start a small business in your neighborhood. Your father borrows from the bank at an annual interest rate of rate for months. What is the amount of interest he will pay on this loan?
3. Mr. Rodriguez invests in a savings plan. The savings account pays an annual interest rate of on the amount he put in at the end of each year.
   1. How much will Mr. Rodriguez earn if he leaves his money in the savings plan for years?
   2. How much money will be in his savings plan at the end of years?
   3. Create (and label) a graph in the coordinate plane to show the relationship between time and the amount of interest earned for years. Is the relationship proportional? Why or why not? If so, what is the constant of proportionality?
   4. Explain what the points and mean on the graph.
   5. Using the graph, find the balance of the savings plan at the end of seven years.
   6. After how many years will Mr. Rodriguez have increased his original investment by more than ? Show your work to support your answer.

**Challenge Problem**

1. George went on a game show and won . He wanted to invest it and found two funds that he liked. Fund 250 earns interest annually, and Fund 100 earns interest annually.  George does not want to earn more than in interest income this year.  He made the table below to show how he could invest the money.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| Fund 100 |  |  |  |  |
| Fund 250 |  |  |  |  |
| Total |  |  |  |  |

* 1. Explain what value is in this situation.
  2. Explain what the expression represents in this situation.
  3. Using the simple interest formula, complete the table for the amount of interest earned.
  4. Write an equation to show the total amount of interest earned from both funds.
  5. Use algebraic properties to solve for and the principal, in dollars, George could invest in Fund 100. Show your work.
  6. Use your answer from part (e) to determine how much George could invest in Fund 250.
  7. Using your answers to parts (e) and (f), how much interest would George earn from each fund?