Simple Interest

Lecture 2
Section 10.2

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Outline

Terminology

- The situations we will consider involve a lender and a borrower.
- The lender is the one who lends the money to the borrower.
- The borrower is the one who borrows the money from the lender.

Terminology

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  - Deposits money in a bank account?
  - Buys stock in a company?
  - Uses a credit card to make a purchase?
  - Makes mortgage payments?
- In all cases, the party that pays the interest is the borrower. The other party is the lender.

Outline

Definitions

Definition (Principal)

The principal P is the amount of money borrowed or invested.

Definition (Interest Rate)

The interest rate r is the percentage of the principal paid by the borrower to the lender (investor) over a given period of time, usually a year.

Definitions

Definition (Term)

The term t is the duration in time of the loan or investment, usually in years.

Definition (Annual Percentage Rate)

The annual percentage rate, or APR, is the interest rate,as a percentage of the principal, when the term is one year.

Definitions

Definition (Present Value)

The principal P is also called the present value of the loan.

Definition (Future Value)

The future value F of a loan is the principal plus all accrued interest.

Outline

Simple Interest

Definition (Simple Interest)

When a loan is based on simple interest, the interest rate is applied to the *original* principal, not the current balance.

Simple Interest

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- This comes from the principal P plus the yearly interest Pr for each of t years:

$$\begin{aligned} F &= \text{principal} + \text{interest} \\ &= P + (Pr)t \\ &= P + Prt \\ &= P(1 + rt). \end{aligned}$$

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- If the future value of a 5% loan for 10 years is $2,000, what is the present value?
- If the interest on a $5,000 loan for 4 years is $600, what is the interest rate?
- Suppose that the present value is $6000 and the term is 10 years. If the future value is $9,000, what is the interest rate?

Outline

Assignment

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- Chapter 10: Exercises 17, 18, 25, 26; 67.