

ENGINEERING ECONOMICS

Simple Interest

$$\begin{aligned}I &= Pin \\F &= P + Pin \\F &= P(1 + in)\end{aligned}$$

where: I = interest
 P = principal present worth
 n = no of interest periods
 i = rate of interest per interest period
 F = accumulated amount or future amount worth

Types of Simple Interest

1. Ordinary Simple Interest – based on 30 days per month or 360 days per year (also known as the banker's year).
2. Exact Simple Interest – based on the exact number of days in a year, 365 days for an ordinary year and 366 days for a leap year.

Note: A year is a leap year if it is divisible by 4 except when it is divisible by 100 but not by 400.

Examples: 1996 (leap year)
1900 (not leap year)
2000 (leap year)

Compound Interest

In calculations of compound interest, the interest for an interest period is calculated on the principal plus total amount on interest accumulated in previous periods. Thus compound interest means "interest on top of interest".

$$\begin{aligned}F &= P(F/P, i\%, n) \\ \text{or} \\ F &= P(1 + i)^n \\ P &= F(1 + i)^{-n} \\ \text{or} \\ P &= F(P/F, i\%, n)\end{aligned}$$

where: $(F/P, i\%, n) = (1 + i)^n$ – single payment compound factor (SPCAF)
 $(P/F, i\%, n) = (1 + i)^{-n}$ – single payment present worth factor (SPPWF)

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Table of Contents Engineering Economics Examples

1. Understanding the eBook Engineering Economics Examples
 - The Rise of Digital Reading Engineering Economics Examples
 - Advantages of eBooks Over Traditional Books
2. Identifying Engineering Economics Examples
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Engineering Economics Examples
 - User-Friendly Interface
4. Exploring eBook Recommendations from Engineering Economics Examples

- Personalized Recommendations
- Engineering Economics Examples User Reviews and Ratings
- Engineering Economics Examples and Bestseller Lists
- 5. Accessing Engineering Economics Examples Free and Paid eBooks
 - Engineering Economics Examples Public Domain eBooks
 - Engineering Economics Examples eBook Subscription Services
 - Engineering Economics Examples Budget-Friendly Options
- 6. Navigating Engineering Economics Examples eBook Formats
 - ePub, PDF, MOBI, and More
 - Engineering Economics Examples Compatibility with Devices
 - Engineering Economics Examples Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Engineering Economics Examples
 - Highlighting and Note-Taking Engineering Economics Examples
 - Interactive Elements Engineering Economics Examples
- 8. Staying Engaged with Engineering Economics Examples
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Engineering Economics Examples
- 9. Balancing eBooks and Physical Books Engineering Economics Examples
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Engineering Economics Examples
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Engineering Economics Examples
 - Setting Reading Goals Engineering Economics Examples
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Engineering Economics Examples

- Fact-Checking eBook Content of Engineering Economics Examples
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
- Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends
- Integration of Multimedia Elements
 - Interactive and Gamified eBooks

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