SEKAEL

# The Building Blocks of Accounting Math



# BEFORE Studying This Chapter...

## Confusing Calculations

Specific calculations like adding sales tax, figuring out overtime pay, or calculating a profit margin might seem like confusing, unrelated problems.

## Application Uncertainty

You may know how to add and subtract but feel unsure how to apply those skills to essential business tasks like finding a company's profit or an employee's take-home pay.

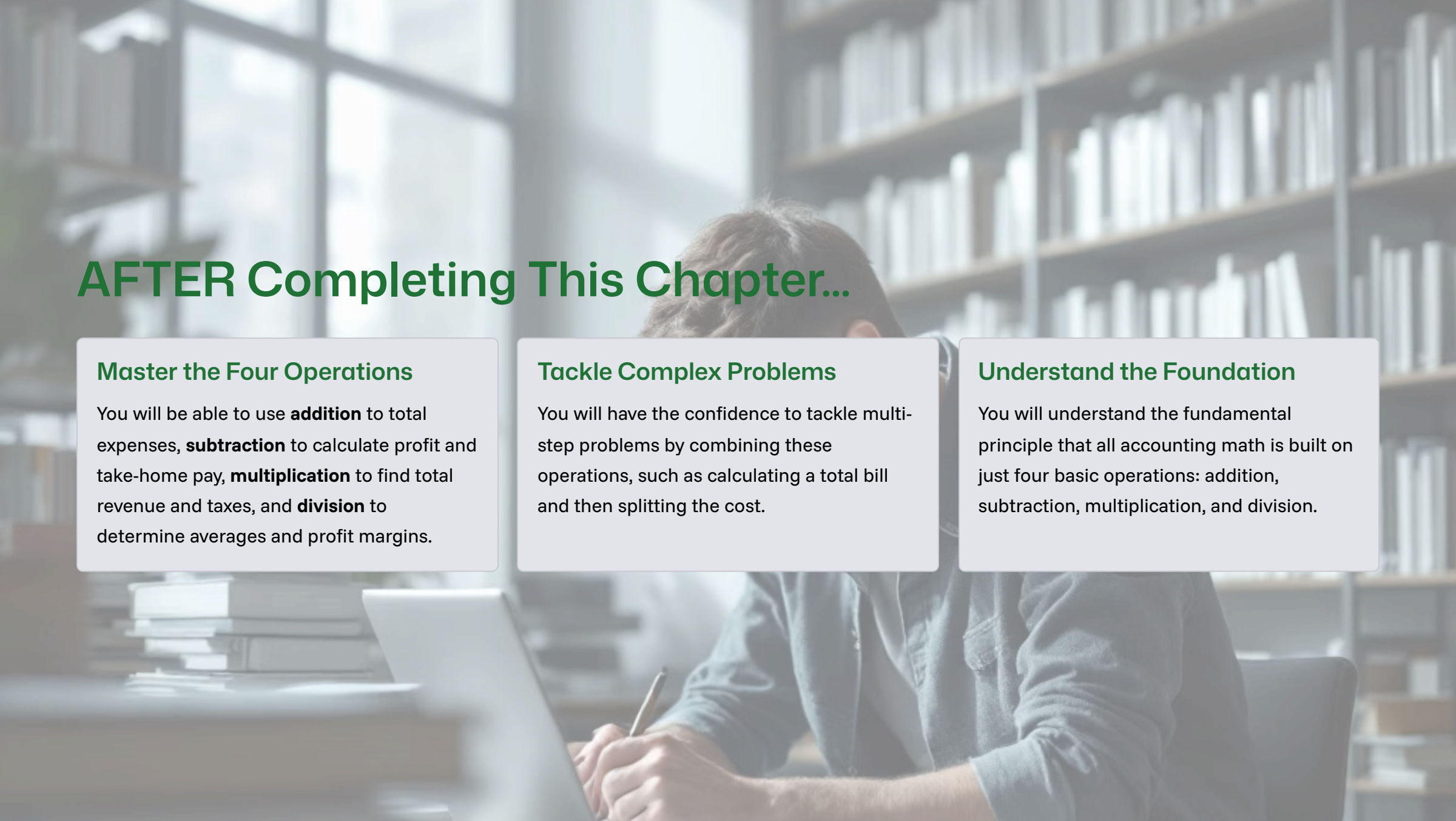
## Multi-Step Problems

When faced with a multi-step financial problem, you might not know where to begin or which operation (add, subtract, multiply, or divide) to use first.

## Math Intimidation

Overall, you might believe that accounting requires advanced or complicated math skills, which could feel intimidating.





# AFTER Completing This Chapter...

## Master the Four Operations

You will be able to use **addition** to total expenses, **subtraction** to calculate profit and take-home pay, **multiplication** to find total revenue and taxes, and **division** to determine averages and profit margins.

## Tackle Complex Problems

You will have the confidence to tackle multi-step problems by combining these operations, such as calculating a total bill and then splitting the cost.

## Understand the Foundation

You will understand the fundamental principle that all accounting math is built on just four basic operations: addition, subtraction, multiplication, and division.

# The Building Blocks of Accounting Math

Welcome to the foundational chapter of your accounting journey. Many believe accounting requires advanced mathematics, but the reality is that it's built on four basic tools: addition, subtraction, multiplication, and division. These operations are the main ingredients in every financial recipe. Whether you're analyzing a global corporation or managing a personal budget, everything comes back to these fundamentals. In this chapter, we'll explore how these simple operations are the key to understanding the financial health of any business.


# 1. Addition: Building the Financial Picture

In accounting, addition is how we bring things together to see the big picture. We use it to combine individual transactions into meaningful totals.

## Common Scenarios:

- **Totaling Expenses:** Finding out how much was spent in a period.
- **Combining Sales:** Calculating total revenue from different sources.
- **Summing up Deductions:** Understanding the total amount withheld from a paycheck.

# Country-Specific Examples:

### Japan - Hobby Budget

Jenelie is buying supplies for her garden. To find her total cost, we add up each item.

- Soil: 3 bags at ¥500 each = ¥1,500
- Pot: ¥800
- **Total:** ¥1,500 + ¥800 = **¥2,300**

### America - Creative Project Costs

Patricia is buying supplies for her new project. Her total cost is the sum of all her individual purchases.

- Gel Nail Polish: $15
- Bracelet Supplies: $12
- Journal: $10
- **Total:** $15 + $12 + $10 = **$37**

### Philippines - A Day Out

Cris goes café hopping. To know her total spending for the day, she adds the cost of coffee, pastry, and gas.

- Coffee: P180
- Pastry: P250
- Gas: P150
- **Total:** P180 + P250 + P150 = **P580**

**Instructor's Note:** Notice how we are simply grouping similar items (costs) together. This is a core concept in accounting called **aggregation**.

# 2. Subtraction: Finding the Bottom Line

Subtraction is crucial for finding the "net" result. It helps us see what's left after we account for costs, deductions, or changes. It answers the question, "Where do we stand now?"

## Common Scenarios:

- **Calculating Profit:** The classic formula: **Revenue - Expenses = Profit**.
- **Budget vs. Actual:** Finding the difference (or **variance**) between what you planned to spend and what you actually spent.
- **Calculating Take-Home Pay:** Gross Pay - Deductions = Net (Take-Home) Pay.

# Country-Specific Examples:


## Japan - Profit Calculation

- A business earns **¥300,000** in revenue.
- The costs (expenses) to earn that revenue were **¥240,000**.
- **Profit:** ¥300,000 - ¥240,000 = **¥60,000**

## America - Saving for a Goal

Patricia wants to buy a retro video game that costs $60. She has already saved $45.

- **Amount still needed:** $60 (Goal) - $45 (Saved) = **$15**

## Philippines - Calculating Take-Home Pay

Zyrine remembers her first job. Her gross pay (total earnings before deductions) was P3,000.

- Her employer deducted P400 for taxes and social contributions.
- **Take-Home Pay:** P3,000 - P400 = P2,600

# 3. Multiplication: Scaling Up Numbers

Multiplication is our tool for calculating totals when we have multiples of the same item. It's a shortcut for repeated addition.

## Common Scenarios:

- **Calculating Sales Revenue:** Price Per Item × Number of Items Sold.
- **Calculating Wages:** Hourly Rate × Hours Worked.
- **Calculating Taxes:** Taxable Amount × Tax Rate.

# Country-Specific Examples:


## Japan - Overtime Pay

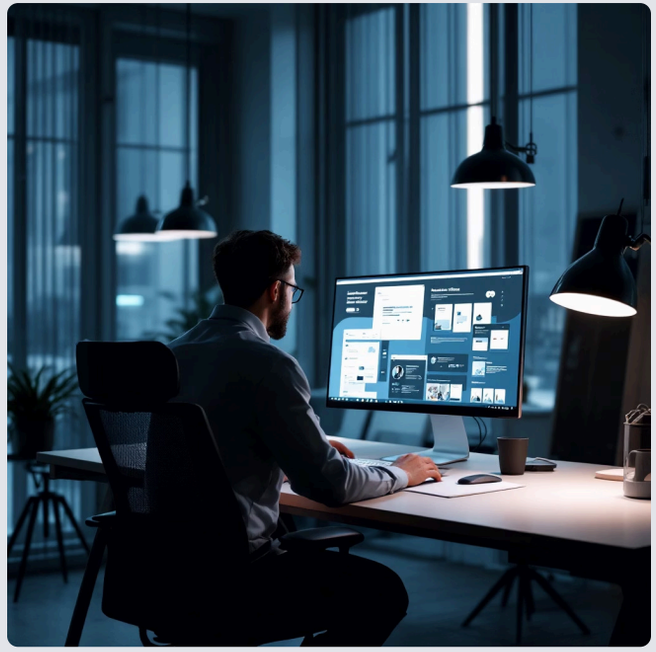
Jenelie's friend works 10 overtime hours. The overtime rate is 1.25 times his normal hourly wage of ¥2,000.

- **Overtime Hourly Rate:** ¥2,000 × 1.25 = ¥2,500
- **Total Overtime Pay:** ¥2,500 × 10 hours = **¥25,000**


## America - Calculating Sales Tax

In 2025, California's sales tax is around 7.25%. A customer buys $200 worth of goods.

- To calculate tax, we convert the percentage to a decimal: 7.25% becomes 0.0725.
- **Sales Tax Amount:** $200 × 0.0725 = **$14.50**
- The final price the customer pays is $200 + $14.50 = $214.50.



## Philippines - Freelance Web Design

Cris develops a website for a client, working 20 hours at a rate of P500 per hour.

- **Total Fee:** 20 hours × P500/hour = P10,000

# 4. Division: Breaking It Down and Finding Relationships

Division helps us break down large numbers into smaller, more understandable parts. We use it to calculate averages, percentages, and performance metrics.

## Common Scenarios:

- **Finding an Average:** Average Cost = Total Cost ÷ Number of Units.
- **Calculating Profit Margin:** This important metric tells you what percentage of revenue is profit. The formula is: **(Profit ÷ Revenue) × 100**.
- **Determining Cost Per Person:** Total Cost ÷ Number of People.

# Country-Specific Examples:

01

## Japan - Profit Margin

A store has ¥1,000,000 in sales and a profit of ¥200,000.

- **Calculation:** (¥200,000 ÷ ¥1,000,000) = 0.20
- To express this as a percentage, we multiply by 100: 0.20 × 100 = **20%**.
- This means that for every yen in sales, 20% of it was profit.

02

## America - Sharing Costs

Patricia and 3 friends (4 people total) have a dinner bill of $80.

- **Cost Per Person:** $80 ÷ 4 people = **$20 per person**.

03

## Philippines - Sharing a Team Lunch

Cris orders chicken wings for her team of 5. The total bill is P1,500.

- **Cost Per Person:** P1,500 ÷ 5 people = **P300 per person**.

# Putting It All Together: A Sample Payroll Calculation

Payroll is a perfect real-world example of how all four operations work together. Below is a simplified look at a monthly payslip in each country.

# America - Standard Payroll

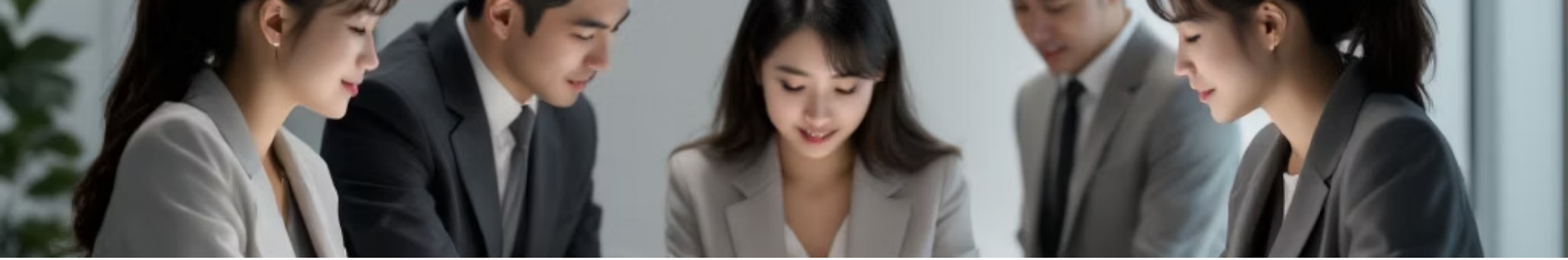
Gross Pay: $3,500

Pre-tax Deductions (like health insurance): -$100

Taxable Income: $3,500 - $100 = $3,400

Taxes Withheld (Federal, FICA Social Security & Medicare): -$500

Net (Take-Home) Pay: $3,400 - $500 = $2,900



# Japan - Standard Payroll

Base Salary: ¥300,000

Overtime Pay: +¥25,000

Gross Pay (Total Earnings): ¥300,000 + ¥25,000 = ¥325,000

Deductions (Social insurance, taxes): -¥70,000

Net (Take-Home) Pay: ¥325,000 - ¥70,000 = ¥255,000

# Philippines - Standard Payroll

Base Salary: P20,000

OT Pay: +P2,000

Gross Pay (Total Earnings): P20,000 + P2,000 = P22,000

Deductions (Tax, SSS, PhilHealth, etc.): -P3,500

Net (Take-Home) Pay: P22,000 - P3,500 = P18,500

# Practice Problems: Test Your Skills

Let's apply what you've learned with a few scenarios. Don't worry about getting it perfect—the goal is to practice thinking through the steps.

## Japan - Multiplication & Addition

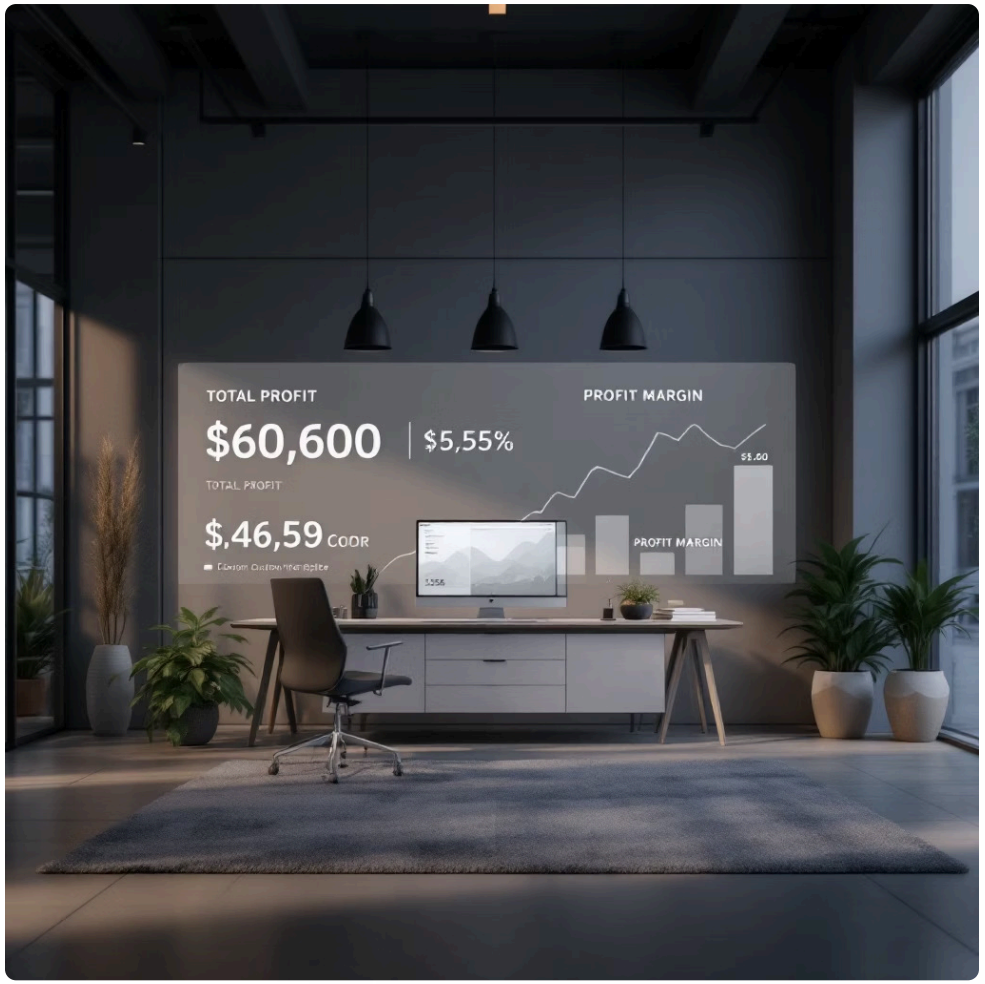
Jenelie buys supplies for her pets. She gets 2 bags of cat food at ¥1,500 each and one dog toy for ¥800. What is the total cost before tax?

## America - Subtraction

Patricia sets a budget of $75 for art supplies. After her shopping, she has $25 left. How much did she spend?

## Philippines - Multiplication & Division

Cris and two friends (3 people total) go out for sisig. They order two servings at P350 each and three drinks at P80 each. How much should each person pay to split the bill evenly?




## General - All Operations

Zyrine sells 4 custom video templates for $50 each. Her monthly software subscription to create them costs $30. What is her total profit, and what is her profit margin as a percentage?

# Answers and Explanations

### A1: Total Cost = ¥3,800

- **Step 1 (Multiplication):** Calculate the cost of the cat food: 2 bags × ¥1,500 = ¥3,000.
- **Step 2 (Addition):** Add the cost of the toy: ¥3,000 + ¥800 = **¥3,800**.

### A2: Amount Spent = $50

- **Step 1 (Subtraction):** You find the difference between her budget and what's left: $75 - $25 = **$50**.

## A3: Each Person Pays = P313.33

- **Step 1 (Multiplication):** Cost of sisig: 2 servings × P350 = P700.
- **Step 2 (Multiplication):** Cost of drinks: 3 drinks × P80 = P240.
- **Step 3 (Addition):** Total bill: P700 + P240 = P940.
- **Step 4 (Division):** Split the bill: P940 ÷ 3 people = **P313.33**.

## A4: Profit = $170, Profit Margin = 85%

- **Step 1 (Multiplication):** Calculate total revenue: 4 templates × $50 = $200.
- **Step 2 (Subtraction):** Calculate profit: $200 (Revenue) - $30 (Cost) = **$170**.
- **Step 3 (Division):** Calculate profit margin: ($170 Profit ÷ $200 Revenue) = 0.85.
- **Step 4 (Multiplication):** Convert to percentage: 0.85 × 100 = **85%**.

# Chapter Summary & Key Takeaways

As you can see, every number in accounting tells a story, and the four basic math operations are the language we use to tell it.

### The Rules Are Universal, The Details Are Local

While addition, subtraction, multiplication, and division are the same everywhere, the *rules* for what to add (like sales tax in the U.S. or VAT in the Philippines) or what to subtract (like social insurance in Japan) are specific to each country. This is why local knowledge is so important in accounting.

### Accuracy is Everything

A small calculation error can lead to big problems. Always double-check your work.

### You've Got This!

If you can handle these examples, you have the mathematical foundation you need to succeed in accounting.

In our next chapter, we will build on this foundation and explore **"Ratios and Percentages in Business"** to learn how to make even more powerful comparisons and decisions.