



# USE OF MATHEMATICAL TOOLS IN MODERN BUSINESS

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*Abstract:* Mathematics plays a vital role in managing business. Business and mathematics go hand in hand this is because business deals with money and money encompasses everything in itself. There is a need for everyone to manage money as some point or the other to take decisions which requires everyone to know mathematics. Business mathematics is used to record and manage business operations. Many Business activities like accounting, financial analysis, sales etc. are done through business mathematics. Commercial organizations use mathematics in accounting, inventory management, marketing, sales forecasting, and financial analysis. It helps you know the financial formulas, fractions; measurements involved in interest calculation, hire rates, salary calculation, tax calculation etc. which help complete business tasks efficiently. Business mathematics also includes statistics and provides solution to business problems. Without mathematics one feels helpless in every aspect of business and commerce.

*Index Terms - Mathematics, Business, Statistics and Commerce*

## I. INTRODUCTION

Mathematics is the backbone of any business. Because a business primarily revolves around the transaction of money or products that have some monetary value. Involvement of money makes it extremely important to have sufficient knowledge about the basics of calculations. Business is always surrounded with challenges which need to be dealt with in a proper fashion so that they do not arise in future. These problems that occur on a daily basis can be effectively solved with the help of mathematical models. Hence mathematics not only helps to calculate but also analyze business problems and work upon them. Learning and using business mathematics enables a person to think out of the box, sharpens one's thinking and helps in precisely formulating and structuring relationships. This is where business mathematics comes into play.

## II. IMPORTANCE OF MATHS IN BUSINESS

In order to learn a business, it needs more expertise than product creation or service distribution. If a company wants to excel in thriving and it needs to look after the finances as well as making appropriate provisions for it to survive. Understanding business mathematics is important to maintain profitable operations and accurate keeping of records. It is required right from the start for pricing products/services till the end when we need to check if the budget was met. Let's look at situations where business mathematics is needed:

### ➤ Estimation of production costs

Before one formally starts production and establishes its business it is very important to estimate the costs that would be incurred in relation to the manufacturing such as the cost of raw materials, machinery, rent, administrative expenses etc. In addition to these basic expenses there are other associated costs such as marketing, warehousing, interest and repayment of loans etc. Once all the expenses relating to production have been included it would be easy to estimate the profit from it to sustain and remain competitive in the market. Accurately determining the cost associated with each item will make the base for the business strong.

The production cost formula is composed of costs that the business or a company incurs in making finished goods or delivering specific services and includes typically direct labor, general overhead expenses, direct material expenses, or expenses on raw materials and supplies expenses.

The production costs should be directly aligned with the revenue generation of the business. The manufacturing business typically has raw materials costs and labor costs. In contrast, typical service industry is composed of technical labor developing a specific service and material costs incurred in delivering such services to the clients. Production cost formula is generally used in managerial accounting to segregate costs to direct and indirect costs.

The production cost formula can be expressed as follows: –

**Production Cost Formula = Direct Labor + Direct Material + Overhead Costs on Manufacturing**

### ➤ Price evaluation

After you have accurately calculated the prices, the next step is to appropriately price the goods such that they produce the best amount of cash flows for potential market needs. Charging the right price for sale will mean the company remained competitive. Here mathematics is very important to evaluate the correct price for your product or service. You have to keep in mind all of the expenses, depreciations, and other liabilities before fixing the price of a product or service of your company.

### ➤ Calculation of profit

Calculation of profits in your business also needs math. It requires net income to be measured by extracting the operational expenses from the gross sales / revenue over time. The vat, interest, insurance costs are always what need to be excluded. This helps to find out if the products are being charged enough to continue the business operations and expand.

### ➤ Analyze Financial Health

To analyze the overall financial health of your business, you will need to project revenue and expenses for the future. It's important to understand the impact to your accounting records when you change a number to reflect an increase or decrease in future sales. It helps in determining how each employee contributes to the business and how it would affect. Using business mathematics helps in making these interpretations and take the business to a higher level.

### III. VARIOUS MATHS TOOLS APPLIED IN BUSINESS

- ❖ Ratios
- ❖ Proportions
- ❖ Logarithms and Anti-Logarithms
- ❖ Simultaneous Linear Equations up to Three variable
- ❖ Matrices
- ❖ Graph

### IV. SCOPE OF MATHEMATICS IN BUSINESS

Business ownership requires more than skill in creating a product or talent at providing a service. Overseeing the finances of your company is key to survival and success. Understanding basic business math is necessary for profitable operations and accurate record keeping. Knowing how to add, subtract, multiply, divide, round and use percentages and fractions is the minimum you need to price your product and meet your budget.

### V. CONCLUSION

In business the mathematical methods and tools are very crucial part of the organization, but it is necessary for the different activities of the organization. It is very useful for the financial analysis using ratios, proportions, matrices etc. The objective of mathematical tools focus minimizing cost and maximizing profit is achieved through various mathematical tools. Matrices play important role in variety of solution for customer relationship and logistic and supply chain management.

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