

14. Mathematics in Development of Business and Commerce - A Study

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Abstract

Mathematics is used in every where in the world . Mathematics plays an important role in *business and commerce*. Without *mathematics* one feels helpless in every aspect of *business and commerce*. economic relations So calculus plays a vital *role* in taxes, profit and revenue calculations which are very *important* for any *business*. It also plays important role in business and commerce , like Business mathematics by commercial enterprises to record and manage business operations. This paper attempts to overview some of the important areas of mathematics such as algebra, matrices, statistics, probability, linear algebra and operational research in business which helps in achieving the business objectives viz. maximizing profits, minimizing costs and ensuring optimal utilization of resources.

Key words: Mathematics, Business and Commerce, Business Mathematics.

Introduction

Mathematics plays an important role every where in the world. . Mathematics and Statistics together used in almost every where in human world such, Physics, Chemistry,, Biology, Psychology, Economics , Industry, Commerce Astronomy, Engineering, Medicine and many more, hence application of mathematics is quite extensive. Many of the top jobs such as business consultants, computer consultants, airline pilots, company directors and a host of others require a solid understanding of basic mathematics. Mathematics is one of the important subjects which increase one's ability to logical thinking, problem solving and reasoning. In today's area of globalization, Business organizations are using mathematics in the field of accounting (viz. financial accounting, cost accounting, corporate accounting, management accounting) inventory management, sales forecasting, marketing, financial analysis (Karatzas & Shreve, 1998) [1]. Without mathematics one feels helpless in every aspect of business and commerce.

Application of Mathematics in Commerce

Mathematics is used in every where in daily life. Business involves the buying and selling of goods in order to earn profit .Mathematics is used by commercial enterprises to record and manage the business operations such as, elementary arithmetic involving fractions, decimals,

maximum profit or lowest cost or ensuring best use of available resources) in a mathematical model whose requirements are represented by linear relationship. Some of industries that use LP model include transportation, energy, telecommunication and manufacturing. Linear function to be maximized by mathematical function.

- **Calculus**

Calculus plays a vital role in any business. Calculus is another branch of mathematics made up of two fields- differential calculus and integral calculus. Differential calculus plays valuable role in management and business for decision making in production (e.g. supply of raw material, taxes, wage rates). In calculus, the case when "y is a function of x" or we can say one variable(y) is dependent on other variable(x) and the derivative of "y" w.r.t. x" i.e. dy/dx measures the change of variable "w.r.t. change in variable x". Derivative enables a firm to make important production decisions. It is also called marginal function. Demand can be assumed as a function of price. This operator is also helpful in calculating minimum cost and maximum profit. Also total cost of production and marketing depends on no. of units in mathematical relations, which can be described as $c(x) = F + v(x)$, where $c(x)$ is cost function $v(x)$ is variable cost and F is fixed cost. Revenue function $R(x)$ can be represented as $R(x) = xp(x)$, where x is no. of units and p is rate per unit. Hence knowledge of derivative is essential for understanding the economic relations. So calculus plays a vital role in profit, taxes, and revenue calculations which are very important for any business.

- **Statistics and Probability**

Statistics is very indispensable for the businessman. It formulates various plans and policies and forecasts trends of future such as change in demand, market fluctuations using statistical techniques. On the other hand, future events are uncertain and to predict these uncertainties, probability is an effective tool to forecast sales, scenario, future returns and risk evaluation in the business world. Before introducing the product, team of market research analyse data relating to population, income of consumer, tastes, preferences, habits, pricing policy of competitors by using various statistical techniques. We can collect and analysis the data in the field of economy by using statistical methods. Probability theory serves as a useful tool for decision making, estimating number of defective units, sales expected and also in business policies. Through the use of statistical (regression) techniques Levine and Zervos (1998) [3] attempted to find the empirical relationship between various measures of stock market development, banking development, and long-run economic growth. They concluded that even after controlling for many factors associated with growth, stock market liquidity and banking development are both positively and robustly correlated with contemporaneous and future rates

- Well planned systems and training are necessary for implementation. Enhancement of university education is also necessary.
- we conclude that knowledge of mathematics should be made compulsory for students of Commerce and Management as it plays important role in any business.

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