

Top 10 Paying Jobs That Involve Math

Overview

Mathematics could be called the oldest science on Earth. Some of the very earliest evidence of mankind thinking about numbers is from notched bones in Africa dating back 35,000 to 20,000 years ago. Thousands of years later, the Sumerians and Babylonians brand of mathematics was based on a sexagesimal, or base 60, numeric system, which could be counted physically using the twelve knuckles on one hand and the five fingers on the other hand. Later came the legend of the 6th Century BC, mathematician Pythagoras of Samos who has become synonymous with the birth of Greek mathematics. By the middle of the 1st Century BC, Roman numerals were the dominant number system for trade and administration in most of Europe for the best part of a millennium. Leap forward to the 16th century when Sir Isaac Newton pioneered a revolutionary new approach to mathematics: infinitesimal calculus. Differential geometry came into its own when Albert Einstein used it in general relativity in 1915.

In the 21st century, the mathematical sciences are a factor in modern communications, transportation, science, engineering, technology, medicine, manufacturing, security and finance. This science is instrumental in the recent development of the human genome, medical imaging, medical diagnosis, information technology, animation as well as in the computational modeling of tsunamis, traffic, and spread of pollutants. Therefore, it is more than just numbers or that subject in middle school many students loved to hate. It can be a rewarding career and perhaps elevate you to the status of Professor of Mathematics, as was Stephen Hawking from 1979 to 2009 at the prestigious University of Cambridge.

1. Data Scientist



The Harvard Business Review in October 2012 referred to the profession of Data Scientist as the “Sexiest Job of the 21st Century.” Why the moniker of ‘sexy?’ Take for example, General Electric that is using data science to optimize the service contracts and maintenance intervals for industrial products. Google uses data scientists to refine its core search and ad-serving algorithms. Netflix created the well-known Netflix Prize, given to the data science team that developed the best way to improve the company’s movie recommendation system. This profession is not indigenous to big tech companies—the need for data scientists has filtered down to companies like Nieman Marcus, Walmart, Clorox and Thomson Reuters.

A data scientist represents an evolution from the business or data analyst role. The formal training is similar, with a solid foundation typically in computer science and applications, modeling, statistics, analytics and *math*. What sets the data scientist apart is strong business acumen, coupled with the ability to communicate findings to both business and IT leaders in a way that can influence how an organization approaches a business challenge. A basic understanding of statistics is vital as a data scientist. Statistics is important at all company types, but especially data-driven companies where the

have a basic knowledge of multivariable calculus or linear algebra, since they form the basis of a lot of data-mashing techniques.

Education: Bachelor of Science

Median Salary: \$97,000

2. Quantitative Analyst



Quantitative analysts or Quants, as they've been called, design and implement complex models that allow financial firms to price and trade securities. They are employed primarily by investment banks and hedge funds, but sometimes also by commercial banks, insurance companies and management consultancies, in addition to financial software and information providers. Topics such as systematic trading, financial research, managing risk, options pricing and quantitative programming are all roles. Quantitative analysis positions are found almost exclusively in major financial centers with trading operations. In the United States, this would be New York and Chicago and also areas where hedge funds cluster, such as Boston and Stamford. The highest-paid positions are with hedge funds or other trading firms, and part of the compensation is dependent upon the earnings of the firm.

The most likely way into a quant job is to obtain a PhD in a mathematical discipline such as Physics, Engineering or CompSci.

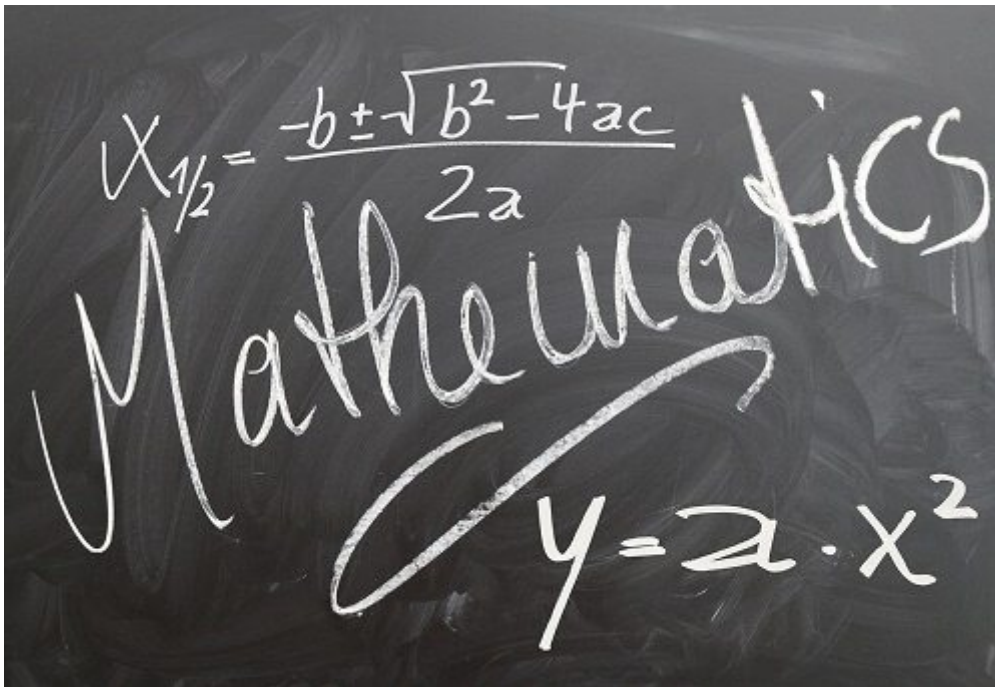
Clearly, mathematical finance is a good area of research, but

probability, stochastic calculus, statistical analysis and machine learning are all highly valued. The main benefit of a PhD course is that the firm will understand your capability towards independent research. Another path into financial engineering is via a Masters course in Mathematical Finance. These are usually known as Master of Financial Engineering (MFE) or Master of Money and Finance (MMF). Individuals who possess natural mathematical ability, but lack financial knowledge, are particularly good candidates for these courses. Most quant positions require an understanding of Calculus, Algebra, Probability, and Statistics.

Education: Minimum Bachelor's degree in a math discipline: Computer science, engineering or statistical analysis

Median Salary: \$88,000

3. Mathematics Professor



You could potentially teach a wide variety of courses if you choose to become a college math professor. First of all, there are courses that involve standardized mathematics, such as pre-calculus, calculus, finite mathematics, probability, numerical analysis and the history of math. You also might teach conceptual math, statistics or even actuarial science and finance. A very common path is to become a professor of mathematical science. In order to become a college math

during your undergraduate years. A few of the classes you might encounter are linear and abstract algebra, geometry and computer science. In order to teach at the collegiate level, you'll need to continue your education in a master's or doctoral degree program in mathematical science or a related discipline. Doctorate programs in mathematical science are typically very competitive to enroll in.

Reviewing job postings for Assistant Professor in Mathematics stipulate a PhD is required from an accredited institution. A posting at higheredjobs.com in September 2015 states that preference will be given to applicants engaged in teaching and research in applied mathematics. Some collegiate postings require teaching experience that may need to be obtained at the high school level. Some teaching positions at this level also require a sustained research program with the potential for securing external research funding.

Education: Doctorate degree in Mathematics/Specialty thereof
Median Salary: \$88,000

4. Treasurer



A treasurer, also known as a certified treasury professional in certain job settings, is an expert in finance who directly oversees the long-term and short-term budgetary goals of a business or an organization. Another interchangeable job title used to describe a treasurer is a

financial officer, the preferred term in the corporate business world. Treasurers can focus more of their time on raising capital, coordinating mergers, and deciding on which companies to acquire in order to further the success of a business or organization. Treasurers employed by a large insurance company would spend a great deal of time preparing financial forecasts based upon the analysis of past and projected financial activity reports. Within large corporations, the company may keep hundreds of financial professionals on staff, overseen by the corporate chief financial officer.

The primary duty of a treasurer, or financial manager, is the administration of an organization's finances—this involves math to some degree. You could be formulating and managing short-term and long-term budgets, handling investments and monitoring the individual and total assets of an organization. Many upper echelon employers would prefer entry-level treasurers to have earned an accounting or finance degree from one of the best universities. Due to the competitive nature of the field, financial managers often continue their education by obtaining a graduate degree in finance, accounting, economics or a Masters of Business Administration.

Education: Bachelor's degree in business with focus on statistics, accounting and economics

Median Salary: \$88,862

5. Actuary



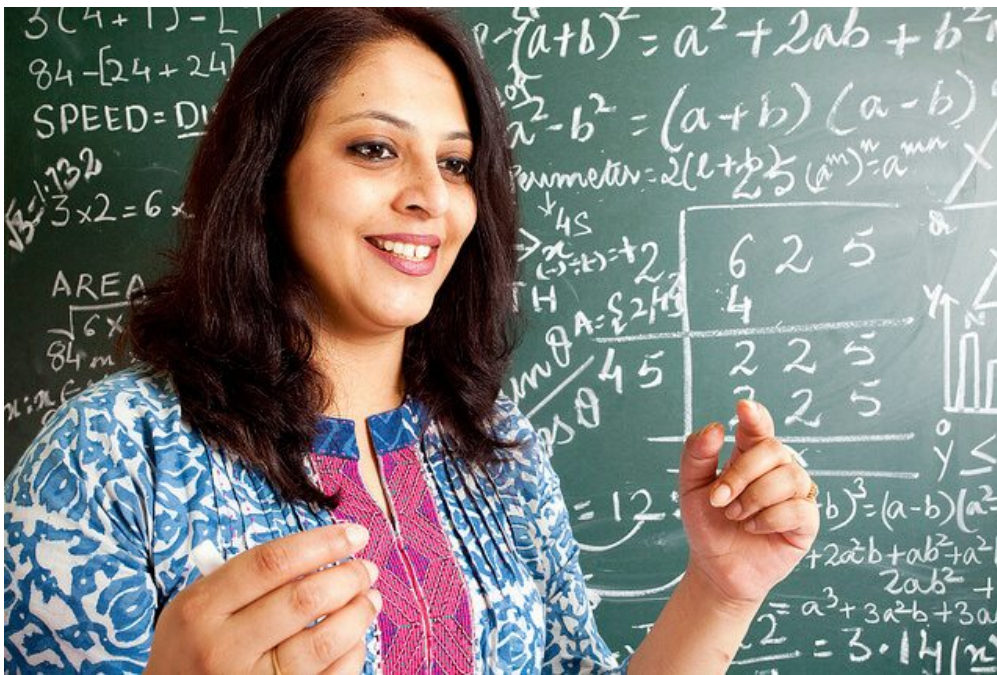
According to the Society of Actuaries (SOA), an actuary is a business professional who analyzes the financial consequences of risk. Actuaries use mathematics, statistics and financial theory to study uncertain future events, especially those of concern to insurance and pension programs. They evaluate the likelihood of those events, design creative ways to reduce the likelihood and decrease the impact of adverse events that actually do occur. Actuaries may work for insurance companies, consulting firms, government, employee benefits departments of large corporations, hospitals, banks and investment firms, or, more generally, in businesses that need to manage financial risk. A career as an Actuary is better described as a “business” career with a mathematical basis than as a “technical” mathematical career. The qualities sought in applicants are high technical ability, good communications skills, and a broad background including courses in *mathematics*, statistics, business, and the liberal arts.

Actuarial Science students take a substantial number of mathematics and statistics courses as well as courses that cover actuarial topics and some courses in the business management arena. Courses in economics, computer science, or courses in writing and communication are very helpful for an actuarial career. With a degree in-hand, there is one significant step before becoming an “Actuary”. You must become an Associate, and ultimately a Fellow, of one of the professional societies by passing a series of examinations administered by them. The largest of the professional groups is the Society of Actuaries (SOA), the organization for actuaries working in life and health insurance, employee benefits, and pensions. The Casualty Actuarial Society (CAS) is the organization for actuaries working in automobile, fire, and liability insurance and workers’ compensation.

Education: Minimum Bachelor of Science in Actuarial Science

Median Salary: \$85,000

6. Mathematician



The origins of mathematical thought lie in the concepts of number, magnitude, and form. Today, mathematicians use high-level mathematics and technology to develop new mathematical principles, understand relationships between existing principles, and solve real-world problems. Other duties include: expand mathematical knowledge by developing new principles, create models to resolve practical problems in fields such as business, government, engineering, and the sciences. Hence, mathematicians work in government and in private science and engineering research. They work on teams with engineers, scientists, and other professionals as diverse as biology and finance. Another promising career is mathematical biology or biomathematics—an interdisciplinary field of study. It models natural and biological processes using mathematical techniques and tools. As previously mentioned, mathematics is utilized in finance to build models that help explain and predict the behavior of financial markets.

Students may begin their quest by attending a summer math camp to explore the world of mathematical research. A great source of information is available at the [American Mathematical Society](#) website. This site provides a host of information from contests to graduate students programs. Which brings us to the requirement of earning a degree which may be done online at colleges such as Indiana University East. This Bachelor of Science in Mathematics program consists of 45 credits in mathematics; the core consists of 27 credit hours in Calculus,

Linear Algebra, Modern Algebra, Real Analysis and Mathematical Modeling.

Education: Bachelor of Science in Mathematics

Median Salary: \$78,000

7. Financial Analyst



Financial analysts evaluate the financial situation in their area of expertise and generate appropriate reports, both written and oral, regarding their recommendations. They monitor and interpret available data such as industry and economic trends, forecast the current trends into probable future profitability, determine a fair market value for the sale of company stock, and recommend action to their company or investors. They also write reports that explain their analyses, share their expertise with colleagues who aren't financial experts and sometimes communicate their perspectives to the public and financial media. Many work for financial companies, including those in the financial services and insurance industries. According to the U.S. Bureau of Labor Statistics, financial analyst positions are expected to grow by 15.5 percent, or 39,300 jobs, by 2022, which is much faster than the average for all professions.

Students with a strong background in higher mathematics and business will excel in achieving a bachelor of science in finance. Coursework will include statistics, managerial finance, business laws, investment analysis, ethics, accounting, international business, and

administration. At this level of education, students typically study advanced theories in business and management and concentrate on one specific financial area, such as international investment or project management.

Education: Minimum Bachelor's degree in finance or related field, plus Certified Financial Analyst (CFA) certification

Median Salary: \$78,000

8. Economist



The website [Investopedia](https://www.investopedia.com) has defined an economist as “an expert who studies the relationship between a society’s resources and its production or output”. Economists study how societies and markets distribute resources, such as raw materials, land, human labor and capital in order to create goods and services. They are employed by a wide variety of entities, including government agencies, investment houses, banks, think tanks, non-profit groups and large corporations. Common duties of economists include collecting data, analyzing reports, utilizing modeling techniques, studying forecasts and producing reports. The expert opinions and research findings of an economist are used to help shape a wide variety of policies, including interest rates, tax laws, employment programs, international trade

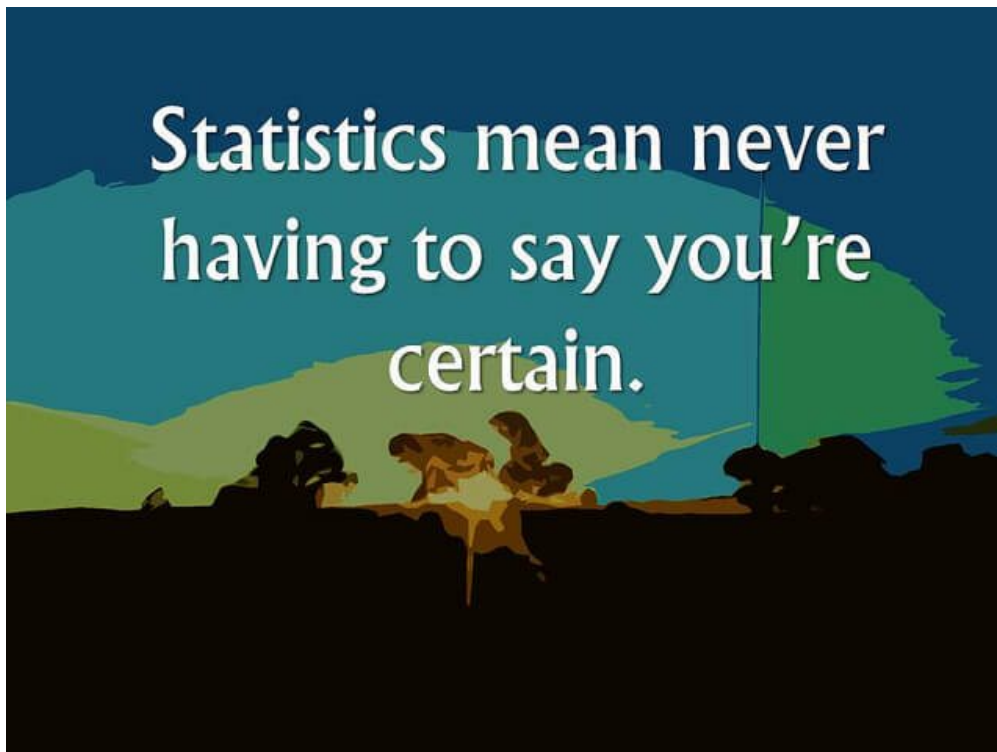
agreements, and corporate strategies. According to the Bureau of Labor Statistics (BLS), roughly 50% of all economists work for either a federal or state agency.

According to the BLS, economist jobs are expected to grow by 6% nationwide through 2020. Demand for economists is expected to be strongest in private industry, particularly with scientific, management and consulting services. The BLS further reports that job opportunities are expected to be good for individuals with strong quantitative and analytical skills, related work experience and advanced degrees. Employers may prefer candidates with a degree in economics, although related fields such as finance and statistics/*mathematics* could be acceptable. Coursework in international trade and finance, investments, public policy and law may be beneficial.

Education: Master's degree in Economics is the preferred/some entry level jobs with a Bachelor's degree

Median Salary:\$77,000

9. Statistician



According to the American Statistical Association (ASA), statistics provides the reasoning and methods for producing and understanding

Statisticians work with people from other professions to solve practical problems. Statistics uses modern computing to organize and analyze data, and statisticians command specialized tools. But the emphasis is on the data to be understood and the problem to be solved, rather than on computing for its own sake. A statistician who works in medicine or in a manufacturing plant or in market research must learn enough medicine or engineering or marketing to understand the data in their setting. More companies are installing elaborate systems to collect and act on data to better serve their customers or improve logistics.

Starting in high school, the student interested in this profession should take statistics, mathematics, science, and computer science courses. Once in college, a major in statistics, applied mathematics, or a closely related field is beneficial. If you do major in a non-statistical field, minor in mathematics or statistics. It is advisable to develop a background in mathematics, science, and computers and gain knowledge in a specific field of interest. One advantage of majoring in statistics is that you can combine your interest with almost any other field in science, technology, or business. As statisticians are needed in health and medicine, business and industry, and government agencies, such as National Defense, Forestry, and Law.

Education: Minimum Bachelor's degree/A master's degree or PhD is often recommended

Median Salary: \$72,000

10. Financial Advisor



A financial advisor is someone who gives financial advice to their

be able to take into account a range of information, including economic trends, regulatory changes, and the client's comfort with risky decisions. Although most financial advisors offer advice on a wide range of topics, some specialize in areas such as retirement or risk management (evaluating how willing the investor is to take chances, and adjusting investments accordingly). Many financial advisors are licensed to directly buy and sell financial products, such as stocks, bonds, annuities, and insurance. A related branch of this profession are the private bankers or wealth managers who are personal financial advisors for those clients who have large sums of money to invest.

Employers usually do not require a specific field of study, a degree in finance, economics, accounting, business, *mathematics*, or law is good preparation for this occupation. Courses in investments, taxes, estate planning, and risk management are also helpful. Financial advisors who directly buy or sell stocks, bonds, insurance policies, or specific investment advice need a combination of licenses that varies based upon the products they sell. Also, these professionals are required to be registered with whatever federal agency regulated their services. Certifications such as the Certified Financial Planner (CFP), Chartered Financial Consultant (ChFC), or Chartered Investment Counselor (CIC) should be on each graduate's To Do list.

Education: Bachelor's degree minimum

Median Salary: \$63,000

Author's Note: The quoted median salaries are taken from PayScale. The figures are meant for informational purposes only as salaries are extremely diverse—dependent on the stature of the business, as well as your rank within the a particular corporation.

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