

# The Application of Higher Mathematics in Different Subject Areas

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**Abstract:** Mathematics is a basic science, and mathematical ideas and some mathematical theories have contributed greatly to the promotion of social progress and development. Higher mathematics has been applied in many subject areas, and the development of many disciplines is inseparable from the participation and intervention of higher mathematics. In a certain sense, higher mathematics has a significant impetus to the development of other disciplines, and the development of many disciplines cannot be separated from the support of higher mathematics. This paper will analyze the specific application of higher mathematics in different subject areas, and thus clarify the application value of higher mathematics in various disciplines.

## 1. Introduction

The knowledge of mathematics has the basic characteristics of logic and system. The knowledge of higher mathematics not only has the characteristics of the existing subject knowledge, but also is widely used. All along, higher mathematics has been widely used in the daily production activities and research activities of people. The development of corresponding research in many subject areas is more or less necessary to apply higher mathematics knowledge to a certain extent. It can be seen that the application of higher mathematics in different subject areas has become a very common phenomenon, and its application value has also been fully explored. It is also necessary to better use higher mathematics knowledge. The application properties and values have a better perception[1].

## 2. Overview of interdisciplinary applications in advanced mathematics

The interdisciplinary application of higher mathematics refers to the research application of higher mathematics knowledge in other subject areas. Since mathematics is a basic subject, mathematics knowledge itself is closely related to many disciplines. Higher mathematics can naturally be many. Applied in the subject area. After entering the new century, electronic computers have been applied in various subject areas. Advanced mathematics applications are a large number of calculations and can be completed by electronic computers. This undoubtedly removes the biggest obstacles in interdisciplinary application of higher mathematics and enhances its Prospects for interdisciplinary applications. It is not difficult to find out through the analysis of the knowledge of natural sciences such as physics, chemistry and biology. The relationship between these natural science disciplines and mathematics knowledge is relatively close. Many discipline theories contain a strong mathematical thinking, which makes higher mathematics possible. Applied in many natural science disciplines. In interdisciplinary applications in higher mathematics, higher mathematics is more of a tool to help or promote the development of other disciplines or solve problems in disciplines. The mathematics knowledge itself comes from life, and its application in different subject areas has also achieved good results. With the continuous development of higher mathematics, it can also be applied in more subject areas and exert corresponding application value[2].

## 3. The application value of higher mathematics in other disciplines

The application of higher mathematics in other subject areas has important significance and value. This is not only a manifestation of the value of higher mathematics itself in other subject

areas, but also an important reason why higher mathematics can be better applied in other subject areas. . Specifically, the application of higher mathematics in other subject areas can promote the further development of other disciplines. In the process of disciplinary development, the research problems of various disciplines need to be continuously solved, and the process of scientific development is also constantly solving various problems. The process of higher mathematics can be better applied in the resolution of subject problems, which is also the application value of higher mathematics in other disciplines. Secondly, the application of higher mathematics in other disciplines can promote the emergence of many new scientific research results. The solution of scientific problems needs to be applied to higher mathematics knowledge, and the corresponding research results are also inseparable from the support of the application of higher mathematics knowledge. Finally, the application of higher mathematics in other disciplines can be used for scientific research or education personnel to conduct corresponding research education through some new choices. The subject knowledge and research focus of different disciplines are different, and the research is limited to the single subject knowledge system. Education is not advisable. The use of advanced mathematics knowledge to a certain extent can also provide some different ideas and choices for scientific research and education personnel to carry out corresponding research and education activities [3].

#### **4. The application of higher mathematics in specific subject areas**

Physics is an important discipline in the natural science system. Higher mathematics is widely used in the field of physics. From the perspective of compulsory education and the knowledge composition of physics in higher education, many basic physics knowledge and physics theory can glimpse the "shadow" of mathematical thinking. The generation of some physics theories is also closely related to the application of higher mathematics. In addition, at the applied physics level, some quantitative calculations of radial appropriateness and force need to be applied to advanced mathematical knowledge. Differential is one of the cores of higher mathematical knowledge systems, and it has become an important tool in physical computing. The calculation of instantaneous velocity and acceleration in physics should be applied to differential and differential equations. The three basic laws in the field of physics are closely related to higher mathematics in practical application. Not only that, physics is widely used in modern society. Whether it is applied physics or more profound astrophysics, derivatives and definite integrals are necessary choices for physics problems in the corresponding fields. It is not an exaggeration to say that the generation of modern physics theory system is inseparable from the support of higher mathematics disciplines. Since the three laws of Newton were regarded as the "family" of physics, physics has always maintained with the development of higher mathematics. close relationship. After analyzing the research results of modern physics, it is not difficult to see that after the use of higher mathematics thinking and the application of specific subject knowledge, the development of physics is likely to stagnate, new physics theory or some classic physics problems. Solving requires a large area of application of advanced mathematics[4].

The study of chemistry is the existence and transformation of matter. Higher mathematics has also been widely used in the field of chemistry and has exerted its extremely obvious value. The application of advanced mathematics in the field of physics is relatively early, which is inseparable from the direct application of Newton's three laws of mechanics to higher mathematics. The application of advanced mathematics in the field of chemistry is relatively late, but it is undeniable that the application of higher mathematics in the field of chemistry is also very broad. Higher mathematics has made positive contributions to the vigorous development of modern chemistry. In modern chemistry, quantitative analysis in higher mathematics has been used more in metrology chemistry, and the advanced mathematical knowledge designed by many chemical theory knowledge is more and more profound. In the calculation of reaction rates associated with some elementary reactions, advanced mathematical knowledge can be used to prove some chemical conclusions or to derive chemical formulas. Whether in organic or inorganic chemistry, complex calculations are indispensable, and some research difficulties in the field of applied chemistry

require the application of definite integrals and derivatives, and computational knowledge of advanced mathematics. The application has also made the chemical and physical fields have great similarities in the application of higher mathematics. In the field of chemical analysis, the ultimate idea in higher mathematics has also been applied. Especially when the related research activities of chemical and biological cross-cutting are carried out, higher mathematics can also be used to calculate some limit values. It can be seen that although the application time of higher mathematics in the field of chemistry is relatively late, the application value of higher mathematics in the field of chemistry is very large, and many scientific research activities in the field of chemistry cannot be separated from the application of higher mathematics knowledge. It shows that there is some intrinsic connection between advanced mathematics and chemical knowledge, and this connection is becoming more and more closely with the increasing application of higher mathematics in the field of chemistry.

From the perspective of medical development, contemporary medicine is highly dependent on various project research in development, and research in the medical field is gradually shifting from qualitative research to quantitative research, exploring the quantity and quantity of matter in the medical field. The relationship between the relationship and the law of change has also become the focus of medical research. The application of higher mathematics in the medical field is mainly applied to specific medical research. In quantitative analysis, higher mathematics has unparalleled advantages, and it has become an essential basic subject knowledge type in medical research. For example, in the prevention and control of some epidemic diseases, medical workers usually establish corresponding mathematical models and carry out the epidemiological characteristics and regularity of the disease. The number of infections and the degree of spread can also be constructed through mathematical models. The analysis of the data is better reflected. In the research and development of some drugs, advanced mathematics can also be used. Many new drugs need to be verified and analyzed to a certain extent before the large-scale clinical promotion after the development of large-scale drugs. The combination of qualitative analysis and quantitative analysis The method is also the most feasible. In this state, advanced mathematics will be applied to the development of new drugs, trials and clinical trials. Not only that, in many medical branches such as sports medicine, advanced mathematics has also been used to a certain extent. Although the degree of application of higher mathematics in the medical field has not been deepened in the field of physics, the application of higher mathematics in the medical field is extremely Rigorous and different from the application of higher mathematics in other disciplines, the application of higher mathematics in the medical field is an application that gradually transitions to depth. Although the scope of application of higher mathematics in the medical field is relatively narrow, the effect of application It is very significant, and it has a direct impetus to the results of a series of medical research and the conclusion.

Modern biology is in the midst of rapid development, and the importance of life science is increasing. Biology has also received a lot of attention in its development. In the continuous development of biology, higher mathematics is not only widely used but also plays an important role and plays an important role. Biology-related research activities require a lot of sophisticated calculations in progress, and data calculations in the life sciences are not only complicated, but also inseparable from the use of advanced mathematical knowledge. Since the initial "Mediterranean Shark Problem" was well interpreted by mathematicians using mathematical knowledge, some advanced mathematical theories such as differential equation theory have been applied in the field of biology. Today, big data technology is very mature. Many biologists often need to rely on big data technology to collect data, overall and analysis, and to explore higher mathematics knowledge when exploring natural ecological laws and exploring the life cycle of animals and plants. Use to find the final research results. Whether in the overall development of biology, or in the sub-disciplines related to life sciences and eco-environment, higher mathematics has been applied to a certain extent and plays a corresponding role and value. In the continuous advancement of human society, biological research is required to be forward-looking, which also makes higher mathematics need to be more widely used in the field of biology. In recent years, the number of

biochemical engineering has been increasing. Higher mathematics has also been applied in the calculation of cell growth and the calculation of oxygen transfer in cell clusters. This indicates that the application of higher mathematics in the field of biology is on the more onlooker level. Keep moving closer. With the increasing demand for some complex computing in the development of biology, the biology discipline will have a more obvious dependence on higher mathematics knowledge in the continuous development.

Higher mathematics also has more applications in the field of economics, and high-level mathematics applications can be seen in both microeconomics and macroeconomics. For example, the determination of the law of diminishing marginal returns is closely related to the application of extreme thinking in higher mathematics. Advanced mathematics has a strong auxiliary function for expounding some economic theories under the framework of microeconomics. In macroeconomics, higher mathematics is often used in the formulation of some economic management policies. Under the market economy, macroeconomic development usually associates with some key indexes. Because of the intrinsic links between economic development at various levels, there are also some links between different economic indexes. These linkages can be transformed through the use of mathematical ideas. For the specific formula. In the formulation of some macroeconomic policies, quantitative analysis is necessary. Once quantitative analysis is involved, it is necessary to make certain use of higher mathematical knowledge, so as to clarify the actual strength of macroeconomic policies so that the government can better utilize macroeconomic policies. Carry out specific regulation of economic development. In the field of production and circulation, although supply and demand are simple mathematical knowledge, the supply-demand relationship in the production and circulation field is often affected by many other factors. To maintain the coordination of supply and demand, it is necessary to apply higher mathematics knowledge to a certain extent. . The more common application form is to construct the mathematical model related to the supply and demand relationship, and then use the differential equation to analyze the factors affecting supply and demand one by one to clarify the “elasticity index” of supply and demand. Economic issues often have diversified characteristics. Although interdisciplinary applications of other subject knowledge in the economic field are more feasible, mathematical methods are often the only choice for many economic problems. Higher mathematics knowledge can also be widely used in the economic field. Applications[5].

## 5. Conclusion

In the development of any discipline, it is necessary to constantly solve some problems in the development of disciplines. The forward development of science and technology is a trend. The maintenance of this trend is also inseparable from the application of higher mathematics thoughts and specific subject knowledge. In many subject areas, higher mathematics is more than just a basic subject knowledge. It is more like a tool for subject research and inquiry. When higher mathematics knowledge itself has a wide range of application value, its tool properties of subject research It is also more obvious. Advanced mathematics is in constant development. It is foreseeable that its application in various disciplines will be deeper and play a more important role in the development of other disciplines.

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