EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 01, Issue 06, June, 2025
brightmindpublishing.com
ISSN (E): 3061-6972

THE IMPORTANCE OF APPROXIMATE CALCULATIONS IN HIGHER EDUCATION AND TECHNICAL PRACTICE

Djalilova Turgunoy Abdujalilovna.
Andijan State Technical Institute Associate Professor,
phone: +99899997-16-11

Sayitjonova Mashkhurakhan Tulqinovna,
Teacher, Andijan State Technical Institute, phone: +99893418-41-57.

Abstract
This article covers the application of differential calculus in practical problems. It provides specific examples in the fields of finding extreme values of functions, optimization, physics (movement, velocity, projectile range), economics (maximizing profit, minimizing costs), and geometry (minimizing surfaces). Each example is explained with step-by-step solutions, which shows the practical significance of theoretical knowledge.

Keywords: Differential calculus, derivative, extremum, optimization, maximum, minimum, practical problems, physics, economics, geometry, cylinder, projectile, profit, area, cost, speed.

Introduction

Every in a subject issues solution following such as main general didactic goals there is, of course:

1. Students by training in the subject given fundamental and complicated practical problems system solution methodology mastery.
2. Subject basis organization doer issues solution in the process given training in the material abstract scientific concepts concretization and deep analysis to do
3. In students every how complicated technical engineering issues solution general and innovative methods in marking creative research, critical thinking and to the problem complex approach to form.

Approximate calculations according to issues solution to the student only mathematics, differential equations, numerical methods, probabilities theory and

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mathematician statistics only in sciences not, maybe to them related was physics, mechanics, electrical engineering, computer science, engineering graphics, construction mechanics, hydraulics such as technician also widely in the sciences is applied.

Issues solution process himself/herself this somehow complicated technician difficulties overcome or this from difficulties around optimal ways to pass find to know, that is in advance solution as impossible visible to the goal scientific and practical approach through achieve means. Approximate from calculations practical issues students mathematics one row important engineering and scientific applications with introduces. The following issues seeing Let's go out.

Approximate from calculations practical issues students mathematics one row important applications with introduces. The following issues Let's see.

1. Weight between 85 kilograms and 90 kilograms 7 people carrying loads with a capacity of 600 kg in the elevator wait can you?

This is an addition, subtraction, multiplication problem. and of the division accuracy evaluation limit “method” topic right comes and stream one person's weight (weight) value q. ch. (lower border) $= 85 \leq p \leq q$ (high limit) 90 to right comes. The matter solution for us below border and high set the limits to 7 if we multiply enough:

$$85 \cdot 7 = 595 < 600 \text{ va } 90 \cdot 7 = 630 > 600.$$

Here this to say It is necessary that these 7 people all 85 kg in weight people was just in case they in the elevator rise possible, but every probably against this to do need no, it's better in the elevator 6 of them raised acceptable.

2. Car of the wheel diameter $66\ sm$ if b dies $1\ km$how many times rotation Calculate. This problem is approximate. calculations practical applications It is relevant. However It's interesting that this on the ground everyone given numbers is approximate, that is wheel diameter of the wheel for the moment related. Circle length find in the formula π- the number is also an experimental number, only distance length $1\ km$ we are very clear measured we get possible. The issue solution for to us wheel circle length calculation need.

$$S = \pi D \approx 3.14 \cdot 66 \approx 207.24 \approx 207\ sm.$$

$1\ km$ distance in passing how many times rotation to know for this distance 207 to we will not be must:

$$100000 : 207 = 483.$$

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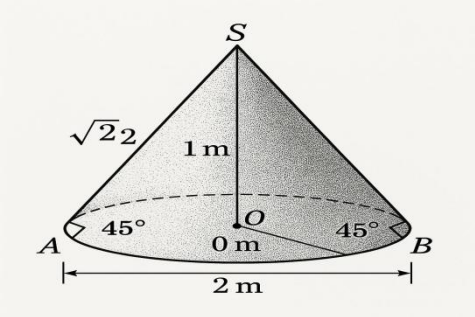
So wheel one km to go the distance for 483more than k times It should be turned around. These issues removable that's it, student given and the result external environment with directly to tie strives for. This emphasizing transition it is necessary, this of issues role this skill and of issues in life application is to prove. Practical issues solution In the process, first of all, the person demanding, self-centered relatively own to the conclusions determination and them full based on give to know such as talent develops.

3. Let's say, construction foreman mathematics faculty to the student sand expense size to calculate ordered Let be. Cone in the form of of the pile size calculation easy to be for ASBwhat sofa 2 $m$and 45°let us assume that the base angles are from (figure).



So, cone makers 1 m from if so, its height cone based on circle radius equal and he too$\frac{\sqrt{2}}{2}$ what organization will reach.

Now calculating let's see:

$$V_k = \frac{1}{3}\pi r^2 h = \frac{1}{3}\cdot 3.14 \cdot \left(\frac{\sqrt{2}}{2}\right)^2 = \frac{3.14\sqrt{2}}{12} \approx \frac{3.14 \cdot 1.41}{12} \approx 0.36895\ m^3.$$

These calculations from lack case not, of course (this on the ground measurements, agreements in mind (being held) Now exactly this issue foreman himself how solves? It simply ASB distance, that is 2 m what to the cube enlarges and 20 distribution will reach.

$$ASB \approx L \text{ desak, unda } V = \frac{L^3}{20} = \frac{2^3}{20} = \frac{8}{20} = 0.4\ m^3.$$

Here The error does not even amount 0,05 to a cubic meter. That is,

$$0.4\ m^3 - 0.36895\ m^3 = 0.03105\ m^3.$$

4. (From the Farmer sidebook). Farmer middle on account one bush 14 to 15 in a seedling chest If the crop of the area every one 100-110 thousand per hectare

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seedling planted if, productivity what kind will be (every one opened in the womb cotton 3-3.5 to grams (take it)?

This issue given numbers multiplication way with solution possible. But we ca n't do this. to the point borders method support Let's see.

1.1 ga in cotton seedling number:

$$10 \cdot 10^4 \leq N \leq 10^4 \cdot 11.$$

2. Same on the field breasts number:

$$14 \cdot 10 \cdot 10^4 \leq N \cdot K \leq 15 \cdot 11 \cdot 10^4.$$

3. Same from the chest tulle picking taken cotton amount.

$$14 \cdot 10^4 \cdot 10 \cdot 3 \cdot 10^{-3} \leq N \cdot k \cdot m \leq 15 \cdot 11 \cdot 10^4 \cdot 3.5 \cdot 10^{-3}\ (kg).$$

Visible It is clear that productivity two from the side limited, that is

$$4200 \leq N \cdot k \cdot m \leq 5775 \quad kg.$$

Productivity lower with a minimum limit calculated is, this on the ground Yield up to 42 quintals, high border and excess with calculated is, this on the ground yield 58 quintals close That's it.

5. Airplane $10\,km$ at altitude horizontal in the direction flying Speed $720\,km/soat$. Take leaving of the load to the destination fall for pilot the load from the target how away (horizontal) (in the direction) need ?

The matter solution with a physical formula garden, but approximate calculations using solved. Physics from the chair to us this thing It is known that from ha height V_0 elementary speed with thrown of the body flight distance using the following formula is:

$$l = V_0 \cdot t = V_0 \sqrt{\frac{h \cdot 2}{g}}.$$

Of these value let's say:

$$l = 720 \cdot \sqrt{\frac{2 \cdot 10000}{9.8}} \approx 720 \cdot 14.1 \approx 10\ km.$$

Conclusion and High In education importance.

Above statement done issues from seeing goal that is, the highest education student his/her own **fundamental knowledge (mathematics, physics, computer science)** vital and complicated technician issues with how much related that he / she is perception Let it be. This issues solution in the process he /she not only

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approximate calculations according to, maybe in general all natural and engineering sciences according to taking knowledge qualifications his/her for **scientific in research, design, technological processes in optimization and working release in practice** how much necessary that it is Let it feel in practice. Issues solution of intellect specific is a characteristic, intelligence and human for separately given It is a gift. That's why for issues to solve human of the activity, especially **technician expert and scientific employee** of activity characteristic from the looks of it we consider one possible.

References

1. Джалилова, Т. А., Комолова, Г. Ш. К., & Халилов, М. Д. У. (2022). О РАСПРОСТРАНЕНИИ СФЕРИЧЕСКОЙ ВОЛНЫ В НЕЛИНЕЙНО-СЖИМАЕМОЙ И УПРУГОПЛАСТИЧЕСКОЙ СРЕДАХ. Oriental renaissance: Innovative, educational, natural and social sciences, 2(3), 87-92.
2. Djalilova, T. (2022). О РАСПРОСТРАНЕНИИ СФЕРИЧЕСКОЙ ВОЛНЫ В НЕЛИНЕЙНО-СЖИМАЕМОЙ И УПРУГОПЛАСТИЧЕСКОЙ СРЕДАХ. Scienceweb academic papers collection.
3. Djalilova, T. (2022). Solution of the energy equation of a two-phase medium taking into account heat transfer between phases. Scienceweb academic papers collection.
4. Ergashov, S. (2022). Differensial tenglamalarni mehanika va fizikaning bazi masalalarini yechishga tadbiqlari. Scienceweb academic papers collection.
5. Акбарова, С. Х., & Халилов, М. Д. (2019). О краевой задаче для смешанно-параболического уравнения. In Andijan State University named after ZM Babur Institute of Mathematics of Uzbekistan Academy of Science National University of Uzbekistan named after Mirzo Ulugbek Scientific Conference (pp. 88-89).
6. Акбарова, С. Х., Акбарова, М. Х., & Халилов, М. Д. (2019). О разрешимости нелокальной краевой задачи для смешанно–параболического уравнения. International scientific journal «global science and innovations, 130-131.
7. Ergashev Sultonmurod, K. B. (2021). DIFFERENSIAL TENGLAMALARNI MEHANIKA VA FIZIKANING BAZI MASALALARINI YECHISHGA TADBIQLARI. НАМАНГАН МУҲАНДИСЛИКТЕХНОЛОГИЯ ИНСТИТУТИ ИЛМИЙ-ТЕХНИКА ЖУРНАЛИ, 430-433.

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 01, Issue 06, June, 2025
brightmindpublishing.com
ISSN (E): 3061-6972

8. Abdujalilovna, D. T. (2022). On Cratering In A Flat Barrier Upon Impact Of A Spherical Particle. Journal of Pharmaceutical Negative Results, 2068-2071.
9. Abdujalilovna, D. T., Sayibjon, K., Shukirillayevna, K. G., & Durbekovich, K. M. (2023). Flow Around A Thin Profile With A Two-Phase Medium With Solid Particles. Journal of Pharmaceutical Negative Results, 3592-3596.
10. Turgunoy, D., Komolova, G., & Murodiljon, K. О распространении сферической волны в нелинейно-сжимаемой и упругопластической средах. Innovative, educational, natural and social sciences, 2(3), 2181-1784.
11. Abdujalilovna, D. T., Murodiljon, K., Axrorbek, O., & Bexzod, T. (2023). SOME STUDIES OF THE FLOW OF A TWO-PHASE MEDIUM WITH SOLID PARTICLES AROUND BODIES WITH A SIGNIFICANT CONCENTRATION OF PARTICLES. MODELS AND METHODS FOR INCREASING THE EFFICIENCY OF INNOVATIVE RESEARCH, 3(29), 43-47.
12. Abdujalilovna, D. T., & Durbek, K. M. (2023). Extreme Problems and Their Study in a Mathematics Course. American Journal of Public Diplomacy and International Studies (2993-2157), 1(10), 113-118.
13. Abdujalilovna, D. T., Murodiljon, K., Axrorbek, O., & Bexzod, T. (2023). IMPACT OF SOLID PARTICLES OF A TWO-PHASE FLOW ON A WEDGE (DIRECT PROBLEM). SUSTAINABILITY OF EDUCATION, SOCIO-ECONOMIC SCIENCE THEORY, 2(13), 299-303.
14. Murodiljon, K., Gulhayo, K., & Bobur, K. (2022). Solve some chemical reactions using equations. European Journal of Business Startups and Open Society, 2(1), 45-48.
15. Komolova, G., Xalilov, M., & Komiljonov, B. Tenglamalar yordamida ba'zi kimyoviy reaksiyalarni yechish. Yevropa biznes startaplari va ochiq jamiyat jurnali.-2022.-2-jild.-Yo'q, 1(8), 45-48.
16. Дурбекович, М. Х., & Жавлонбек, И. Р. (2023, January). ОБ ОСОБЫХ ТОЧКАХ РЕШЕНИЙ МНОГОМЕРНОЙ СИСТЕМЫ В КОМПЛЕКСНОЙ ОБЛАСТИ. In " CANADA" INTERNATİONAL CONFERENCE ON DEVELOPMENTS İN EDUCATİON, SCİENCESAND HUMANİTİES (Vol. 9, No. 1).
17. Xalilov, M. D., & Komiljonov, B. K. (2022). Komolova GS GARMONIK SKALİAR VIBRASYONLARNING KOMPLEKSI VA VEKTOR FOYDALANISHI. Miasto Przyszłości, 341-344.

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 01, Issue 06, June, 2025
brightmindpublishing.com
ISSN (E): 3061-6972

18. Комолова, Г., & Халилов, М. Stages of drawing up a mathematical model of the economic issue. Journal of ethics anddiversity in international communication. Испания-2022, 60, 45-48.
19. Murodiljon, K., & Donyorbek, T. (2021). Experience In Using The Relationship Between Mathematics And Physics In Shaping The Concept Of Limit. TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI, 1(6), 212-215.
20. Gulhayo, K. G. K., Murodil, X., & Bobur, K. Ba'zi kimyoviy reaksiyalarni tenglamalar yordamida yechish. EVROPA JURNALI, 45-48.
21. Xalilov, M. D., Komiljonov, B. K., & Komolova, G. S. (2022). COMPLEX AND VECTOR EXPRESSION OF HARMONIC SCALIAR VIBRATIONS. Miasto Przyszłości, 24, 341-344.
22. Murodiljon, K., Gulhayo, K., & Bobur, K. (2022). Solve some chemical reactions using equations. European Journal of Business Startups and Open Society, 2(1), 45-48.
23. Комолова, Г. ХМ (2022.). Комолова Гулхаё, Халилов Муродил, Комилжоноа Бобур,"Solve some chemical reactions using equations". EUROPEAN JOURNAL OF BUSINESS STARTUPS AND OPEN SOCIETY, 2(1), 45-48.
24. Xalilov, M. D., Komiljonov, B. K., & Komolova, G. S. Garmonik skalyar tebranishlarning kompleks va vektor ifodalanishi. Miasto Przyszłości. ISSN-L.
25. Tillayev Donyorbek, X. M. (2021). Fazoda urinma akslantirish va uning formalizmga bog 'liqligi. UzACADEMIA ILMIY-USLUBIY JURNALI, 86-92.
26. Komiljonov Boburjon, X. M. (2021). O'quvchilarda funksiya tushunchasini shakllantirish. Matematikani iqtisodiy-texnik masalalarga tadbiqlari va oqitish muammolari,(стр. 297-303). Узбекистан.
27. Xalilov Murodiljon, K. B. (2021). Irratsional tenglama va tengsizliklarni yechish jarayonida o'quvchilarning ijodiy qobiliyatlarini rivojlantirish. Matematikani iqtisodiy-texnik masalalarga tadbiqlari va o'qitish muammolari (стр. 312-322). Toshkent: Respublika ilmiy-amaliy anjumani.
28. Халилов, М. (2022). Differensial tenglamaga olib keluvchi ba'zi masalalar. Scienceweb academic papers collection.
29. Muradiljon, K., & Mashxuraxon, S. (2023). Application of the Theory of Linear Differential Equations to the Study of Some Oscillations. Web of Synergy: International Interdisciplinary Research Journal, 2(1), 60-65.

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brightmindpublishing.com
ISSN (E): 3061-6972

30. Abdujalilovna, D. T., & Durbek, K. M. (2023). Extreme Problems and Their Study in a Mathematics Course. American Journal of Public Diplomacy and International Studies (2993-2157), 1(10), 113-118.,
31. Джалилова, Т. А., Комолова, Г. Ш. К., & Халилов, М. Д. У. (2022). О РАСПРОСТРАНЕНИИ СФЕРИЧЕСКОЙ ВОЛНЫ В НЕЛИНЕЙНО-СЖИМАЕМОЙ И УПРУГОПЛАСТИЧЕСКОЙ СРЕДАХ. Oriental renaissance: Innovative, educational, natural and social sciences, 2(3), 87-92.
32. Muradiljon, K., & Mashxuraxon, S. (2023). Application of the Theory of Linear Differential Equations to the Study of Some Oscillations.
33. Abdujalilovna, D. T., Murodiljon, K., Axrorbek, O., & Bexzod, T. (2023). SOME STUDIES OF THE FLOW OF A TWO-PHASE MEDIUM WITH SOLID PARTICLES AROUND BODIES WITH A SIGNIFICANT CONCENTRATION OF PARTICLES. MODELS AND METHODS FOR INCREASING THE EFFICIENCY OF INNOVATIVE RESEARCH, 3(29), 43-47.
34. Abdujalilovna, D. T., Murodiljon, K., Axrorbek, O., & Bexzod, T. (2023). IMPACT OF SOLID PARTICLES OF A TWO-PHASE FLOW ON A WEDGE (DIRECT PROBLEM). SUSTAINABILITY OF EDUCATION, SOCIO-ECONOMIC SCIENCE THEORY, 2(13), 299-303.
35. Акбарова, С. Х., & Халилов, М. Д. (2019). О краевой задаче для смешанно-параболического уравнения. In Andijan State University named after ZM Babur Institute of Mathematics of Uzbekistan Academy of Science National University of Uzbekistan named after Mirzo Ulugbek Scientific Conference (pp. 88-89).
36. Акбарова, С. Х., Акбарова, М. Х., & Халилов, М. Д. (2019). О разрешимости нелокальной краевой задачи для смешанно–параболического уравнения. International scientific journal «global science and innovations, 130-131.

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