The Existence of Quasi-Varyational Unequal Solutions in the Study of Fixed Point Index

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Abstract: In higher mathematics, inequality is a very important part of the content, each year in the college entrance examination occupies a relatively large proportion, often in the form of final questions. Therefore, it is necessary for the students to learn to sum up the error-prone questions, and find out their own mistakes and mistakes, and then the corresponding problem-solving skills are sorted out to facilitate the follow-up can achieve targeted review.

1. Introduction

Most students often have a variety of problems, large and small, when solving the inequality of higher mathematics, so it is necessary for teachers to focus on strengthening the teaching of students' error-prone problems in practical teaching, to analyze the problems in students' error-prone problems in depth, and to teach them various problem-solving skills. Based on this, this paper will focus on the analysis of students' current problems, and give corresponding solutions.

2. Focus on the Collection of Error-Prone Questions

Mathematics itself requires learners to have a strong logical thinking ability, so in order to improve the ability to explore inequalities, it is necessary to apply flexible mathematical thinking to simplify some of the more cumbersome problems, such as:

Reciprocal method, reasoning proof method, etc. If, for example, the sum is equivalent; if two of the angles in a triangle are 45°, then it can be concluded that the triangle is an isosceles right triangle. Not only that, in order to use the basic inequality flexibly, we also need students to pay attention to the specific content of the problem during exercise exercises, find out the key and breakthrough of solving the problem, and then form a set of effective ways to solve the inequality problem in their minds after forming a good habit of solving the problem, and solve some simple problem of finding the most value under their practical ability.

Example 1: The images of the function are all above the x axis, and the range of values m the real number is obtained.

Solution: It can be obtained through known conditions, is constant, so its function image opening upward, which can be listed as follows two inequalities:

<19.

Many students in the answer to this question think that the end here, in fact, the function is not necessarily a quadratic function, so we need to focus on this time.

When it happens, it can be solved.

This kind of typical error requires students to record it on the error-correcting book to facilitate the consolidation of learning in the future. Through the analysis of this kind of problems, it can also further promote students to use the way of constructing indirect conditions to cooperate with the known conditions in the problems, and learn to use inequalities to solve more complex mathematical problems.

3. Strengthen the Summary of Easy Mistakes

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The basic theorem of general mean inequality is often applied to solving practical problems and proving problems. There are many such theorems and formulas, so it is necessary for students to keep them in mind, and often to review and consolidate them. In addition, mathematics teaching materials are the most important tools and windows for students to understand the content of knowledge, and many very important core theoretical knowledge have been recorded in detail on the teaching materials, so when choosing auxiliary teaching materials and training exercises for students, we must take the content of teaching materials as the main reference direction, and take all the knowledge points as the focus of study, and then constantly strengthen the summary of error-prone types in practical inquiry.

Example 2: If both roots of the equation are greater than 2, find the range of values of the m.

Let the two roots be x1 and x2,. At this time, the general student will be given ⩾0 and these three basic conditions. This is because this part of the student will be regarded as and equivalent, but in essence the opposite, so this also needs to add two basic range conditions: that is, and, this time can be calculated ⩽-4.

Example 3: it is known that the maximum value of x in inequality ⩽5 is 3, and the value of p is obtained.

Answer: Students are generally unable to perform an effective equivalent exchange when solving this class of questions, and do not understand the specific meaning that the maximum value of x in known conditions is 3 itself.

So you can see from this known condition,

The original inequality can be directly and equivalent, then, then;

If so, then, p., When p, the original equation has no solution, then p..

Although the math problem is always changing, but its core test point is essentially unchanged, as long as contact with more examples, you can skillfully solve all kinds of questions. In addition, students should use the corresponding solutions and means when solving some problems, and closely cooperate with their own learning progress, fully understand their mistakes in solving problems, and make a good summary and excerpts, show the detailed steps and procedures to avoid the same mistakes next time, and ultimately improve their comprehensive ability in mathematics.

4. Strengthen the Error-Prone Notes

When it comes to mathematics, the most important thing is to sum up mathematical errors and master the corresponding rules in order to learn and apply them. so that we are impressed to prevent the same mistake from repeating the problem in the next similar mistake. If only students can simply review the problem, and can not sum up the mistakes, this will waste time, increase the pressure on students to learn, when we sum up the wrong problems, we can use notebooks to write down the inequality in advance on the wrong problems, and then improve their specific learning ability. Then get used to the thinking law of mathematics, use their own mathematical thinking logic, and finally ensure the success of the problem.

Although many learning methods are effective, they all have certain particularity, which is why when dealing with the content of inequality, students should fully understand the rules, develop the good habit of doing questions, and improve the effectiveness of solving problems. When solving problems, primary school students must pay attention to the practical application effect of combining fertilization with inequality, strengthen the classification of mathematical problems and make their own problems more specific.

Example 4: Set, and is an empty set, to find the range of values.

Solution: At this time, the general students from the solution or. The main reason for this error is that the student didn't pay attention to it. Two endpoint values ,-1

With 2.

The basic condition of being an empty set can also be satisfied, so this can be obtained.

Through the above analysis, it can be found that when solving the mathematical problem of inequality and finding the maximum and minimum values of function, students should strictly grasp

the effective law of one positive, two definite and three equal, and apply the classification of mathematics in real life to the solution of practical mathematical problems.

Example 5: And the range of values for the solution.

If the students were to find the range of the a、b according to the known conditions, and then to find the range, that is, the range, then the inequality medium sign will be the important problem that the condition is not necessarily the same, and the problem of representing the region is not necessarily the same.

Skip it.

The main measures to correct this kind of problems are to apply the method of undetermined coefficients to solve them, as follows:

Analysis of the Problem-solving Model of the Absolute Triangle Inequivalence

Type |x-m|+|x-n|

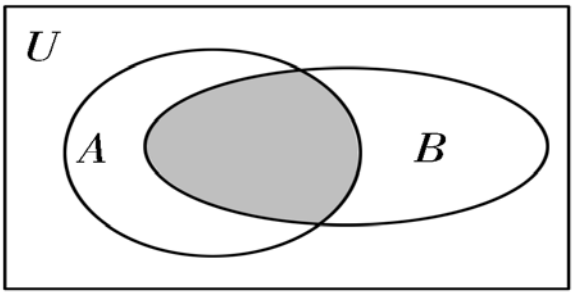

Figure 1 Related pictures

f (x)=|x-m|+|x-n|(m<n) images are A (m), n-m), B (n, n-m) is the "inverted trapezoid" of the folding point (shown in Figure 1), The two ends of the image extend infinitely upward, At [m,] n] no monotonicity, Constant minimum n-m.

using this model, we can quickly find the minimum value of f (x)=|x-m|+|x-n|(m<n) n-m, and thus simplify the steps of inequality solution.

[Example 1](National Volume II Science Question 23,2018) Set function f (x)=5-|x+a|-|x-2|.

(1) Slightly ;(2) If f (x)≤1, find the range of values of the a.

Parsing: This is to find the scope of the a that makes |x+a|+|x-2|≥4 work, The image of f (x)=|x+a|+|x-2| is "inverted trapezoid ", The minimum values are |(- a)-2|=|a+2|(if and only if the equal number holds at 2), So f (x)≤1|x+a|+|x-2|≥4,2|x+a|+|x-2|≥≥4, solved a≤-6 or a≥2.

Model application 1(2012 gaokao mathematics shaanxi science 15) if there are real numbers a make |x-a|+|x-1|≤3 hold, real number a value range.

|x-m|-|x-m|x-n|x-m| type

And when m>n, f (x)=|x-m|-=|x-m|x-n=|x-m| images are C (n, m-n), D (m, n-m) is the "Z glyph" of the folding point (shown in Figure 2), At (-∞, n] constant maximum m-n,. At [m,] +∞) Constant minimum n-m,. At [n,] m] monotone decreasing; And when m<n, f (x)=|x-m|-=|x-m|x-n=|x-m| images are E (m, m-n), F (n, n-m) is the "reverse Z glyph" of the folding point (shown in Figure 3), At (-∞, m] constant minimum m-n,. At [n,] +∞) Constant maximum n-m,. At [m,] n] monotonously increasing.

Using this model, we can immediately obtain the fold point of f (x)=|x-m|-=|x-m|x-n=|x-m|, the maximum and the small value, so that only the critical value that makes the inequality hold can be found in the corresponding possible interval, as shown in figure 2.

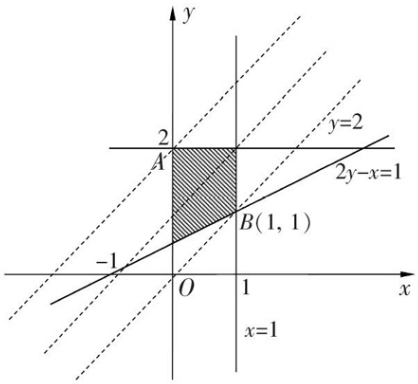

Figure 2 Related pictures

[Example 2](2012 gaokao mathematics Guangdong science 9) inequality |x+2|-|x|≤1 solution set?

Parse :|x+2|-|x|=|x-(-2)|-|x-0|, and its image is "anti- Z glyph ". x∈(-∞, 2] with a constant minimum of 2, Satisfaction; x∈[0, +∞) at constant maximum of 2, Give up; So just in the interval (-2, Find the critical value to satisfy the condition on the 2), At this point the analytic formula is 2 x+2, Two x+ two ≤ one x≤-12, In summary, And the solution set is -∞, -12.

Model application 2(2017 national volume iii science question 23) is known f (x)=|x+1-|x-2|. if the solution set of inequality f (x) is not empty, the value range of the m is obtained.

Type a|x-m|+b|x-n|

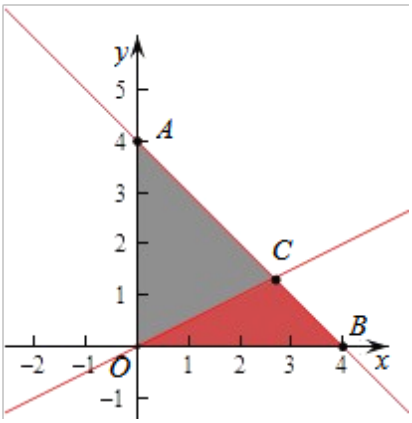

Figure 3 Related pictures

The image of f (x)=a|x-m|+b|x-n|(m<n) is a broken line with G (m), H (n), and H ()) as the folding point (shown in Figure 4).

(1) When a+b>0, the two ends of the image extend infinitely upward, with a minimum value at the fold point min{f (m), f (n)};

(2) When a+b<0, the two ends of the image extend infinitely downward, with maximum values at the fold point min{f (m), f (n)};

(3) When a+b=0, the image is parallel to the x axis.

Using this model, we can see f (x)=a|x-m|+b|x-n|(m<n) the monotonicity and the value at the fold point of each interval segment, so that it is easy to get the maximum value of the function, or the solution set of the inequality.

In general, we can try to solve the problem of inequality by using the method of undetermined coefficients to prevent the above errors.

5. Conclusions

In order to effectively grasp the basic form of inequality and the corresponding application, students need to pay full attention to the collection of inequality errors, which is because the way of

summing up the wrong problems can play a connecting role in learning. Students in the actual problem-solving and error-correcting also need to use the knowledge content flexibly, through error-correcting notes, improve problem-solving skills, improve the effect of mathematics learning.

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