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The Role and Evaluation of ChatGPT as a Virtual Tutor in Improving Students' Creative and Critical Abilities Reviewed from Probing-Prompting Abilities

Abstract

This study reveals the potential of ChatGPT in supporting students' mathematics learning. However, the study's results also show challenges in utilising ChatGPT, such as inconsistent answer quality and potential student dependence on technology. This indicates the need for a more holistic approach to integrating ChatGPT into the learning process. This study aimed to analyse ChatGPT's ability to answer quantitative knowledge and mathematical reasoning questions, assess students' prompting abilities with ChatGPT, evaluate the use of ChatGPT, and measure the extent to which students' mathematical, creative and critical abilities have increased. This study uses an Embedded Design type of Mixed Method approach. The population in this study were all high school students who took the Tridaya Tutoring Program 2024/2025. The sampling technique used was purposive sampling, and the sample selected was all 20 students from class XII of Tridaya Tutoring High School. The research instruments used were written tests, namely multiple-choice questions and documentation studies of screenshots of ChatGPT answer results. The study results showed that the t value for measuring creative and critical abilities was 6.691 and 7.151. It was found that there was a significant difference between the test scores obtained before and after the treatment. This shows that the instructions given to students can improve their test scores. ChatGPT can help students in learning as a virtual tutor. However, it should also be noted that not all questions can be answered. Some even have different answers. This makes students dissatisfied with the results obtained. This is where students are trained in critical thinking why this can happen. In addition, the student's prompting technique for ChatGPT is also considered. There is a need for creativity in prompting so students can further explore the answers from ChatGPT. Although they can answer any question, guidance from the teacher and independent verification are needed regarding the answers given by ChatGPT so that the desired answer is by expectations.

Keywords: ChatGPT; Creative; Critical; Probing-Prompting; Virtual Tutor

Abstrak

Penelitian ini mengungkap potensi ChatGPT dalam mendukung pembelajaran matematika siswa. Namun, hasil penelitian juga menunjukkan tantangan dalam memanfaatkan ChatGPT, seperti kualitas jawaban yang tidak konsisten dan potensi ketergantungan siswa pada teknologi. Hal ini menunjukkan perlunya pendekatan yang lebih holistik untuk mengintegrasikan ChatGPT ke dalam proses pembelajaran. Penelitian ini bertujuan untuk menganalisis kemampuan ChatGPT dalam menjawab pertanyaan pengetahuan kuantitatif dan penalaran matematika, menilai kemampuan prompting siswa dengan ChatGPT, mengevaluasi penggunaan ChatGPT, dan mengukur sejauh mana kemampuan matematika, kreatif, dan kritis siswa meningkat. Penelitian ini menggunakan pendekatan Mixed Method tipe Embedded Design. Populasi dalam penelitian ini adalah seluruh siswa SMA yang mengikuti Program Bimbingan Belajar Tridaya 2024/2025. Teknik pengambilan sampel yang digunakan adalah purposive sampling, dan sampel yang dipilih adalah seluruh siswa kelas XII SMA Bimbingan Belajar Tridaya yang berjumlah 20 orang. Instrumen penelitian yang digunakan adalah tes tertulis, yaitu soal pilihan ganda dan studi dokumentasi berupa tangkapan layar hasil jawaban ChatGPT. Hasil penelitian menunjukkan bahwa nilai t untuk mengukur kemampuan kreatif dan kritis adalah 6,691 dan 7,151. Ditemukan bahwa terdapat perbedaan yang signifikan antara nilai tes yang diperoleh sebelum dan sesudah perlakuan. Hal ini menunjukkan bahwa petunjuk yang diberikan kepada siswa dapat meningkatkan nilai tes mereka. ChatGPT dapat membantu siswa dalam belajar sebagai tutor virtual. Namun, perlu diperhatikan juga bahwa tidak semua soal dapat dijawab. Bahkan ada yang jawabannya berbeda-beda. Hal ini membuat siswa tidak puas dengan hasil yang diperoleh. Di sinilah siswa dilatih untuk berpikir kritis tentang mengapa hal tersebut dapat terjadi. Selain itu, teknik prompting siswa untuk ChatGPT juga diperhatikan. Perlu adanya kreativitas dalam prompting agar siswa dapat lebih mengeksplorasi jawaban dari ChatGPT. Meskipun dapat menjawab soal apa saja, diperlukan arahan dari guru dan verifikasi mandiri terkait jawaban yang diberikan ChatGPT agar jawaban yang diinginkan sesuai dengan harapan.

INTRODUCTION

The Scholastic Assessment Test (SAT) is part of the Test-Based National Selection (SNBT) for entering State Universities,

which has the purpose of measuring the cognitive abilities of prospective students (KEMENRISTEK-DIKTI, 2018) . One of the materials tested is Quantitative Knowledge and Mathematical Reasoning (QKMR) (Disnawati et al., 2022). The question type of SNBT is Higher Order Thinking Skills (HOTS). HOTS refers to a person's ability to think critically, analytically, evaluatively, and creatively in solving problems (Bai et al., 2023). This ability involves more than just remembering information but also analysing information, evaluating arguments, and creating new ideas (R. P. Yaniawati, 2013). The absence of special training at school results in students looking for several learning alternatives outside of school. One of them is to register with the Tutoring Institute (Fahmi et al., 2020). The method used in tutoring is lecture. Along with the times, this is not enough to support students' learning. They find it challenging to work on their problems independently because of the limited interaction between students and tutors. Therefore, students are directed to technology that can become virtual tutors, one of which is artificial intelligence or Artificial Intelligence (AI) (Ding et al., 2023).

AI is a simulation of the intelligence possessed by humans that is modelled into machines and programmed to think like humans. AI has positioned itself at the forefront of research fields ranging from medicine and robotics to education. The application of AI in education has had a significant impact, as evidenced by the improvement of the efficiency of the educational process, the promotion of global learning, the personalisation of learning, the creation of more innovative content and the optimisation of education management in terms of effectiveness and efficiency. The application of AI in education has also become more popular and has received much news in recent years.

One of the applications of AI in the world of education is using *ChatGPT* (Zein & Gunawan, 2022; Montenegro-Rueda et al., 2023; Vong & Kaewurai, 2017; Mohamed et al., 2022; Asad & Ajaz, 2024).

ChatGPT is a recently developed conversational chatbot created by OpenAI, which can make it easier for instructors to apply AI in the teaching and learning process (To, 2023; Lo, 2023). *ChatGPT* can be a valuable educational resource for improving writing skills, as it can generate text, summarise information, and elaborate to save time and improve the quality of work (Setiawan & Luthfiyani, 2023; Atlas, 2023). *ChatGPT* can also help students develop research skills by providing information and resources regarding specific topics, suggesting aspects that have not yet been discovered, and introducing them to new research topics, allowing them to understand better and evaluate the topic. (Rahman & Watanobe, 2023; Kasneci et al., 2023). Learning through *ChatGPT* requires tutors to manage good learning and provide learning assistance to students. In this context, tutors provide learning facilities or means to help students with learning difficulties. This means that tutors are facilitators and solutions to students' learning problems. In this context, tutors are divided into two different roles. First, a tutor who provides learning facilities or means and helps students learn. Second, *ChatGPT* is a virtual tutor that helps students dig up information independently (Sawangwan, 2024; Ruffinelli et al., 2023; Widodo et al., 2022). It is hoped that *ChatGPT* can function as a virtual tutor to support the learning process so that students are expected to use their creative and critical abilities more.

Creative thinking ability is a demand to create an idea or alternative solution to solve problems that occur in daily life.

With creativity in learning, it is hoped that students will dare to solve problems using their methods. So, students can make several alternative answers to solve the problem with the right solution (Monahan & Vaidya, 2023; Yaniawati, *et al.*, 2020, 2021; Mubarika et al., 2022; Feb, 2022)

Critical thinking ability is a thinking skill that involves cognitive processes and invites students to think reflectively about problems. There are three critical thinking activities: investigation, interpretation, and decision-making. For *ChatGPT*, in order to help students work on TPS questions and practising creative and critical thinking skills to the maximum, it is necessary to have a model of how students can present questions that lead to the subject so that there are no misconceptions when *ChatGPT* receives the information (Gartland, 2024; Monteleone et al., 2023). One of the models is the *Probing-Prompting Model* (Halaweh, 2023; Jayanti & Rahmawati, 2018) .

The probing-prompting model is a learning model that provides questions that lead to a subject that allows students to think higher to understand a material during learning. Probing prompting questions at the application level are given to students so that students are used to thinking critically, teaching aids are used in giving questions to make it easier to hone students' critical thinking skills, and then students are allowed to make conclusions from learning outcomes as a way to use the probing prompting learning model and then improve the level of critical thinking skills (Lee et al., 2024; Wiryanto, 2020; Usman et al., 2023)

METHOD

In this study, a mixed method is used, which is a mixture of qualitative and quantitative to provide a better understanding of how the role and evaluation of *ChatGPT*

as a virtual tutor on creative and critical thinking skills are reviewed from students' *Probing-Prompting* skills (Indrawan & Yaniawati, 2017). The design used is the insertion design (*The Embedded Design*). This design only reinforces the research process using a single method between qualitative and quantitative. Here are some of the stages of research carried out (Indrawan & Yaniawati, 2017) (See Appendix A, picture 1 and 2).

Judging from the objectives of this study, the data from the results of this study are how the answers obtained from *ChatGPT* and how the ability to prompt students with *ChatGPT* is qualitative. However, to strengthen the research conclusions, it is strengthened quantitatively so that it has a high level of confidence. The qualitative approach to this study is the grounded theory approach. *The Grounded Theory* method is built on a phenomenon and is structured to produce new theories. The theory is prepared using inductive data analysis. At the same time, the quantitative approach uses Pre-Experimental Design. The pre-experimental design focuses on the impact of changes in the behaviour of the observed research subjects without a control group. The one-group experimental design was used with prates and post-test (the one-group pretest-postest design). Quantitative data was analysed to see if there was an improvement in students' mathematical, creative, and critical thinking skills after being treated with *ChatGPT* as a virtual tutor reviewed from *Probing-Prompting* skills (Deering & Williams, 2020; Oktaria et al., 2023; Punar et al., 2024; Putri et al., 2023; Saifuddin, 2020). The analysis used the Shapiro-Wilk Test to determine whether the data distribution was normal. Then, the Paired T-Test was used to compare the average of one group of paired data with a tab t-value of 0.025 (Silva et al., 2023).

The population in this study is all high school students who participate in Tridaya Tutoring for the 2024/2025 Academic Year. The sample is part of the population selected for the study and is expected to be representative of the entire population. The sampling technique used is purposive sampling, which is a technique in which the researcher has the freedom to select samples according to specific criteria (Indrawan & Yaniawati, 2017). The selection of samples was carried out based on research materials, namely all grade XII high school students in the Tridaya Tutoring Program unit of Buah Batu, MTC, Suco, Antapani, Kopo, and Uber, with a total of 20 students. The characteristics of students are diverse, ranging from those who already understand learning well to those who still need more guidance to understand school material better.

RESULTS AND DISCUSSION

ChatGPT's ability as a virtual tutor in answering PKPM questions

Qualitative Analysis

AI-based chatbots began to emerge in November 2022, when *ChatGPT* was released to the public for the first time. This chatbot can answer any question we ask. This is an innovation, especially in the world of education, especially mathematics, where we are limited to a few applications if we want to know the answers to the questions given by *ChatGPT,* can be a virtual tutor for anyone studying without a learning schedule (Montenegro-Rueda et al., 2023; Jeon, 2024). This is because *ChatGPT* is open source, meaning anyone and anywhere can access it (Ding et al., 2023). Using a laptop or smartphone, we can ask for anything we want. However, the main question arises: Can ChatGPT answer simple to complex math problems? Is *ChatGPT* worthy of being used as a virtual tutor to accompany and even replace the role of a teacher in the world of education?

Because the emergence of *ChatGPT* was only released at the end of 2022, there has not been much research, specifically in mathematics, on how effective *ChatGPT* is in answering the questions given. However, the findings from Lo CK in his 2023 paper entitled *"What is the Impact of ChatGPT on Education"* (Lo, 2023) revealed that *ChatGPT*'s performance was not satisfactory. Even so, the paper also revealed that *ChatGPT* can potentially be a virtual student tutor. This research can potentially contribute to expanding existing theories. The target of this study will reveal a new theory that has a relationship with the previous theory revealed by ole Lo CK based on field facts in detail based on the prompting ability of students and the results of the *ChatGPT* answers.

The data collected is in the form of screenshots of student prompting to *ChatGPT* along with the answers provided *by ChatGPT* based on question criteria. In this study, 10 PKPM questions were given, with 4 different material topics and different levels of difficulty, including numbers, measurements and geometry, data and uncertainty, and algebra. Then, students prompted ChatGPT with several sample sections, including uploading questions or questions without optional options and uploading questions or questions with optional options. After the data is collected, data analysis is carried out based on a sample of the order of questions on each topic of the material. The data displayed results from prompting students to ChatGPT (See Appendix C, picture 3 to 10).

out using the Shapiro-Wilk Test to determine whether the distribution of data was normal. Then, the paired t-test was used to compare the average of one data group with the help of SPSS and a tab t value of 0.025 (Arikunto, 1999). The hypothesis of the Paired T-Test is as follows (See Table 1 and 2) (Dhianti Putri et al., 2023).

Table 1. Results of Calculation of Paired T Test of Creative Ability

| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of Difference | | t | df | Sig. (2-tailed) |
					Lower	*Upper*			
Pair 1	Before being given treatment – After being given treatment	-	16.37553	3.66168	-	-	-	19	.000
		24.50000			32.16398	16.83602	6.691		

Table 2. Results of Calculation of Critical Ability Paired T Test

| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of Difference | | t | df | Sig. (2-tailed) |
					Lower	Upper			
Pair 1	Before being given treatment – After being given treatment	-	15.00877	3.35606	-	-	-	19	.000
		24.00000			31.02432	16.97568	7.151		

Quantitative Analysis

Quantitative data was analyzed to see if there was an improvement in students' mathematical, creative, and critical thinking skills after being treated with *ChatGPT* as a virtual tutor reviewed from *Probing-Prompting* skills. The analysis was carried

Discussion

ChatGPT's ability as a virtual tutor in answering PKPM questions

This research is to test ChatGPT's ability to answer PKPM questions. Based on the analysis that has been carried out, it was found that ChatGPT can answer questions either through prompting or only in the form of picture clippings. Students feel helped by the presence of this ChatGPT. They felt helped by some of the answers given However, to upload questions with pictures was only limited to 2 pictures per day. This makes students need to be selective in asking ChatGPT which questions need to be asked along with pictures or not.

This is in line with what Korkmaz et al said. that ChatGPT-4 is more successful

in the exam compared to ChatGPT-3, version 5, is better at understanding the questions asked, better understands the instructions and includes more details in the solution of the questions, and at the same time, the two versions make common and different mistakes. According to the findings of the study, it was concluded that ChatGPT sometimes works very well, sometimes it only works well and sometimes it fails. Based on the findings of the study, it may be suggested to use the ChatGPT version in mathematics education to obtain basic information and to get supervised assistance. (Korkmaz Guler et al., 2024; Sapkota & Bondurant, 2024)

It is also in line with research from Lin who explains that by harnessing the power of AI, ChatGPT can help adult learners in setting learning goals, finding available resources, designing personalized learning plans, monitoring their performance, and reflecting on their learning experiences, ultimately leading to effective SDL completion (Lin, 2024). In addition to mathematics, in physics subjects similar to mathematics to calculate problems, Ding et al. were tested. Specifically, the study tested ChatGPT's accuracy in answering physics questions, the relationship between students' level of trust in ChatGPT and the accuracy of their answers, and the effect of trust on students' perception of ChatGPT. Our findings show that while GenAI is not accurate in answering questions, most students trust its ability to provide correct answers. Trust in GenAI is also associated with students' perception of GenAI. In addition, the study highlights students' misconceptions about GenAI and provides suggestions for future consideration in AI literacy teaching and research (Ding et al., 2023).

Evaluation of ChatGPT as a virtual tutor in answering PKPM questions is reviewed from Probing-Prompting capabilities

ChatGPT provides the same steps when the questions given are only one way such as no 1 and 2 where the first question has been determined and the second question is in the form of a comparison. ChatGPT can provide different work steps for questions that measure student creativity, both in the form of multiple choice and essays. This provides a new perspective for students that working on problems is not only done through one way. Even though ChatGPT has been trained first, there are still mistakes in interpreting questions. For example, in question number 9, some students found that ChatGPT misinterpreted the question even though the prompting was the same. The slightest mistake in prompting, especially in writing equations and signs, will affect the answers given by ChatGPT. Students feel helped by the presence of ChatGPT as a virtual tutor because they can learn independently anytime and anywhere without disturbing their teachers. However, they are not satisfied with the results of ChatGPT's answers because they need answers to more complicated and complex questions

This is in line with previous research that academics were also aware that the use of ChatGPT raises concerns, such as inaccurate, unreasonable, or unclear outputs. We, two math teacher educators, engaged in a collaborative self-study using a qualitative descriptive approach to investigate the procedures, concepts, and cognitive demands of ChatGPT-generated math tasks that focused on fractional multiplication using an area model approach. We found that the tasks generated by ChatGPT are mostly procedural and not cognitively demanding. We suggest that educators do not rely entirely on ChatGPT to generate fractional multiplication tasks that demand cognitive abilities by using area models. We offer recommendations for educators to use

ChatGPT strategically to generate math tasks that demand cognitive abilities. Aligned with Newton & Xiromeriti, that ChatGPT underperforms and fails most multiple-choice exams, performing much worse than the average human student. These findings suggest that all summative MCQ-based assessments should be conducted under secure conditions with limited access to ChatGPT and similar tools, specifically exams that assess basic knowledge (Sapkota & Bondurant, 2024; Newton & Xiromeriti, 2024)

The need for good prompt ability to communicate is explained by Mustafa & Saadi. This research discusses the important role of prompt development as an important skill for university instructors engaged with ChatGPT. The results highlight the flexibility of the formula and its potential applications in a variety of areas, from syllabus planning to assessment. The limitations inherent in ChatGPT, emphasized the need for instructors to be cautious in their use and underscored the ever-evolving AI landscape in education (Nazari & Saadi, 2024).

The Influence of ChatGPT as a Vitrual Tutor in Improving Students' Creative & Critical Mathematical Thinking Skills Reviewed from Probing-Prompting Skills

Creative thinking is the process of thinking to increase possibilities, postpone considerations, provide new and unusual possibilities, use imagination and intuition, develop and choose alternatives, and have many ways and use different viewpoints or answers to something. Meanwhile, critical thinking skills are thinking skills that involve cognitive processes and invite students to think reflectively about problems. In this context, students will be seen the ability to think extensively, originality, and the ability to elaborate ideas in addition, students will

be seen three activities in critical thinking, namely investigation, interpretation, and decision-making. The results of the study show that in their prompting ability, students only copy answers, send images in the form of questions to ChatGPT. Students are not creative in asking questions. However, when students are given different answers or there are no answers in the choices, students immediately ask the teacher why this happens. Then, students also validate by looking for answers with material that the teacher has instructed (Surya, 2015; Saputra, 2020; Ennis & Weir, 1985).

This is in line with Niloy et al. which reveals a detrimental relationship between the use of ChatGPT and students' creative writing abilities. Machine-based and human-based assessment analysis reinforces previous qualitative observations regarding the adverse impact of ChatGPT on creative writing. The study highlights the need for a cautious approach to AI integration, particularly in the discipline of creative writing. While AI tools have their advantages, their integration must be done carefully, considering their potential drawbacks (Niloy et al., 2024).

In addition, it is in line with research from Barana et al. The results show that all problem-solving strategies and all phases of critical thinking can be affected by this kind of activity, as students must check the correctness of ChatGPT's solutions, not always true, or check their own solutions through ChatGPT. In addition, the activity also helps them find new and different approaches to solve problems (Barana et al., 2023).

Although it has a negative impact on the prompting, the answers from ChatGPT provided have an impact on students in improving their students' answer creativity skills. This is shown from the different students' answers in answering the questions, the results of the posttest also

show an increase in student scores from the pretest. In addition, this is supported by the results of the T Test which found that the thit result of 6,691 exceeded the ttab.

Implication of Research

The findings regarding ChatGPT's errors in interpreting questions, especially complex questions or requiring a deep understanding of context, show that AI still has limitations in understanding the nuances of complex language and contexts. This indicates the need for the development of more sophisticated AI models to be able to overcome this challenge. Although ChatGPT can be helpful in the learning process, the results of the study show that the role of human teachers and tutors is still very important to provide comprehensive guidance, clarification, and evaluation.

ChatGPT can be an effective tool in learning math, especially to provide instant feedback and diverse sample questions. However, it is important to provide students with clear guidance on how to use ChatGPT effectively and critically. The results of the research can be the basis for the development of a curriculum that integrates the use of AI such as ChatGPT, while still paying attention to its limitations and emphasizing the importance of critical and creative thinking.

Limitation

The limitation of the problem in this study is how the role of ChatGPT can answer general or complex questions, especially in TPS questions. In addition, there needs to be an evaluation because it is basically made different from the application that is usually used in answering questions. Then how to communicate between students and ChatGPT. Finally, can this ChatGPT affect the improvement of students' critical and creative thinking.

CONCLUSION

Based on the results and discussion above, it can be concluded that from the point of view of use, ChatGPT can help students in learning as a virtual tutor. However, it is also necessary to pay attention because not all questions can be answered all, and there are even some who have different answers, especially in working on questions that are complicated and complex. This makes students dissatisfied with the results obtained. This is where students are trained in critical thinking about why this can happen. In addition, student prompting techniques against ChatGPT are also considered. There is a need for creativity in prompting so that students can further explore the answers from ChatGPT. Although it can answer any question, in the end, there needs to be guidance from experts (in this context, teachers) and independent verification of the answers that have been provided by ChatGPT so that the desired answers are in line with expectations

Acknowledgement

Appendix A of article entitled The Role and Evaluation of ChatGPT as a Virtual Tutor in Improving Students' Creative and Critical Abilities Reviewed from Probing-Prompting Abilities
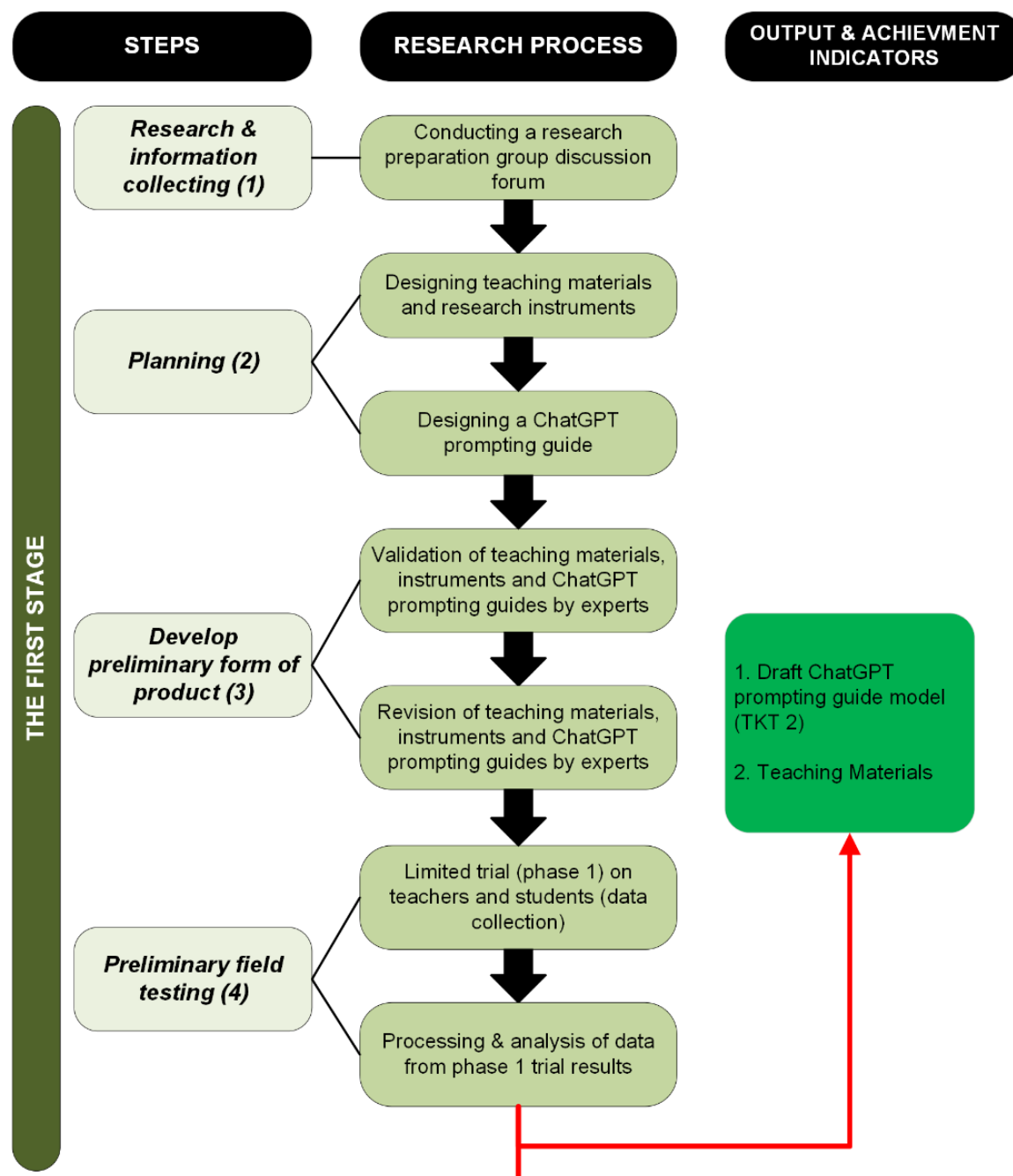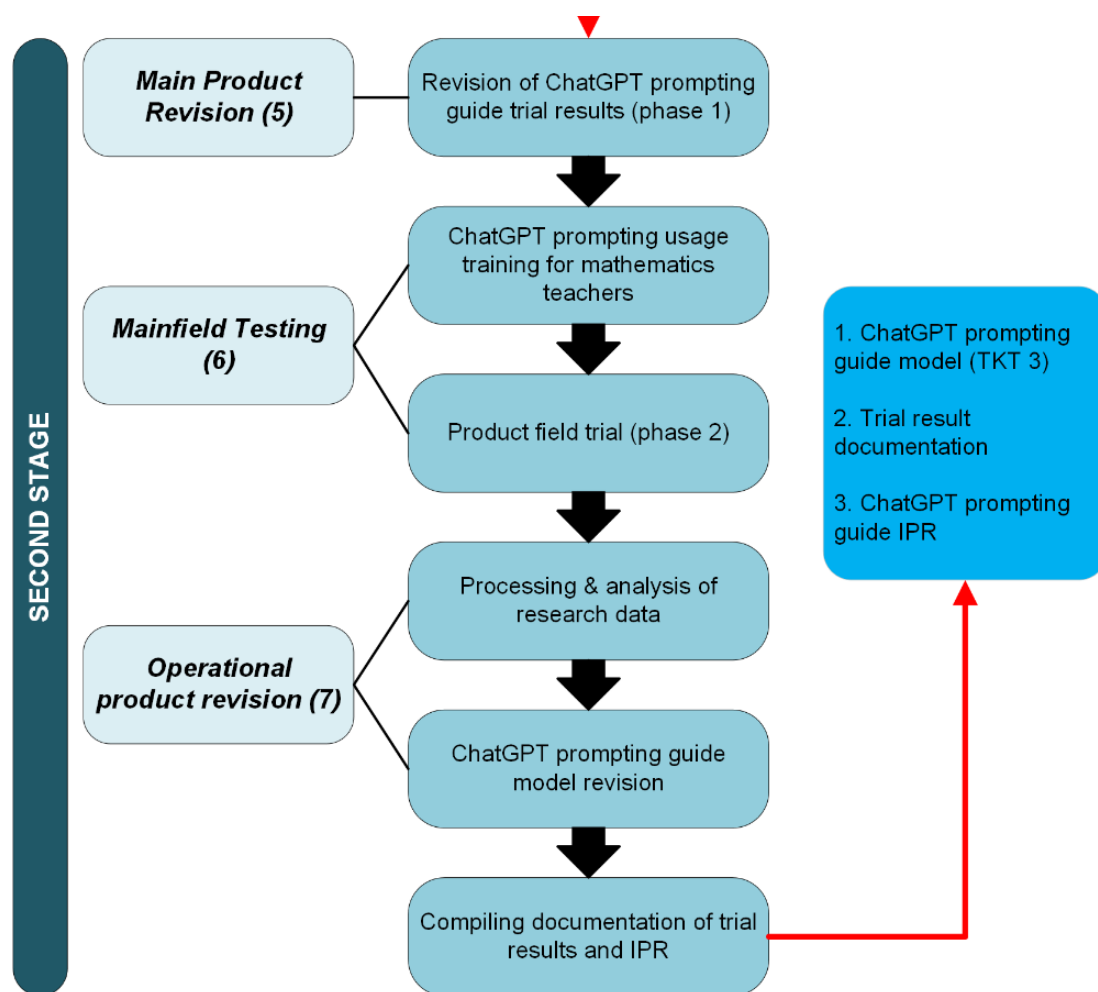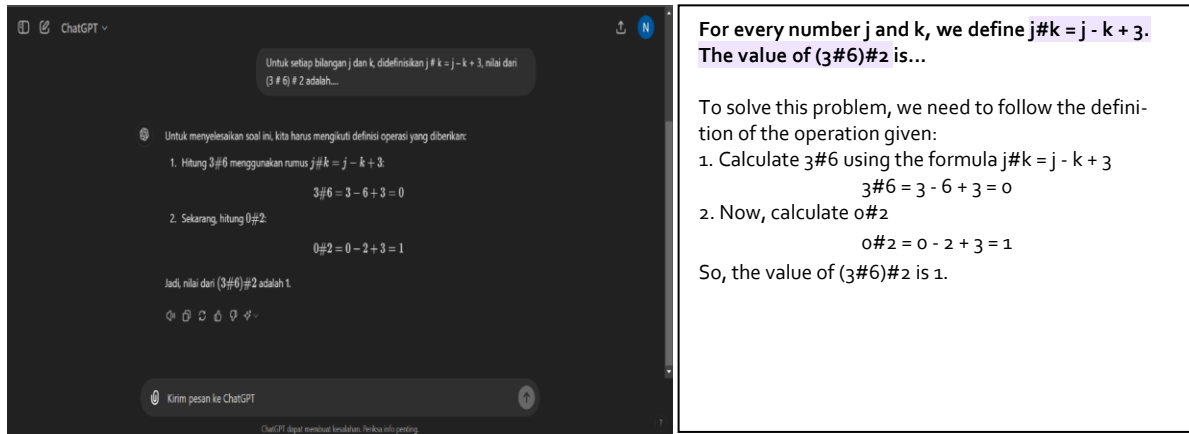

Figure 1. First Stage of Research

Appendix B of article entitled The Role and Evaluation of ChatGPT as a Virtual Tutor in Improving Students' Creative and Critical Abilities Reviewed from Probing-Prompting Abilities

Figure 2. Second Phase of Research

Appendix C of article entitled The Role and Evaluation of ChatGPT as a Virtual Tutor in Improving Students' Creative and Critical Abilities Reviewed from Probing-Prompting Abilities

1. Numbers

For every number j and k, we define j#k = j - k + 3. The value of (3#6)#2 is...

To solve this problem, we need to follow the definition of the operation given:
1. Calculate 3#6 using the formula j#k = j - k + 3
$$3\#6 = 3 - 6 + 3 = 0$$
2. Now, calculate 0#2
$$0\#2 = 0 - 2 + 3 = 1$$
So, the value of (3#6)#2 is 1.
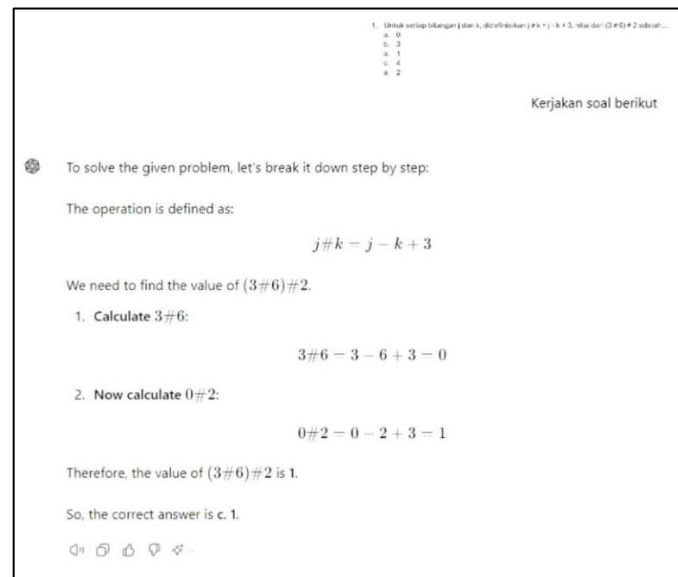
Figure 3. ChatGPT's answer when uploading a question or number question without an option
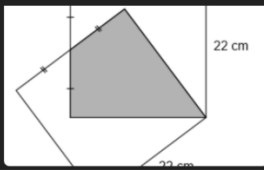
Figure 4 ChatGPT's answer when uploading a question or number problem with optional options

2. Numbers

If d1 = 1/3 d2 and d2 = 3/2 the side of the square, then the perimeter of the kite is...

Based on the given diagram, the kite is formed by two diagonals, d1 and d2. Based on the given information:
1. d1 = 1/3 d2
2. d2 = 3/2 the length of the side of the square, which is 22 cm

The steps are as follows:
1. Calculate the length of d2:
   d2 = 3/2 x 22 cm = 33 cm
2. Calculate the length of d1 using the relationship d1 = 1/3 d2:
   d1 = 1/3 x 33 cm = 11 cm
3. Because the sides of the kite are right-angled triangles formed from half of the diagonals, then the length of each side (for example, a) can be calculated using the Pythagorean theorem:
   s = √((d1/2)² + (d2/2)²)
   s = √((11/2)² + (33/2)²)
   s = √((121/4) + (1089/4))
   s = √((121+1089)/4)
   s = √(1210/4)
   s = √302.5 ≈ 17.4 cm
4. The perimeter of the kite is twice the sum of two different sides.
Perimeter = 2 x (s + s) = 4s = 4 x 17.4 cm = 69.6 cm
Therefore, the perimeter of the kite is 69.6 cm.

Figure 5. ChatGPT's answers when uploading measurement & geometry questions or questions without the option

4. **If d1 = 1/3 d2 and d2 = 3/2 the side of the square, the perimeter of the kite is:**
   - Let's say the side of the square is s, then d2 = 3/2 s, and d1 = 1/3 x 3/2 s = 1/2 s.
   - The perimeter of the kite = 2(d1 + d2) = 2 x (1/2 s + 3/2 s) = 2s.
   For example, if s = 33, the perimeter of the kite is 66.
   Answer: c. 66

Figure 6. ChatGPT's answers when uploading measurement & geometry questions or questions with optional options

3. Data & Uncertainty

8. Peluang Pak Eko Bramantyo suka bubur tidak diaduk Diketahui: • Total orang: 100 • Yang suka bubur diaduk: Laki-laki = ?, Perempuan = ? • Yang suka bubur tidak diaduk: Laki-laki = ?, Perempuan = 23 • Total suka bubur tidak diaduk = 58 Jumlah yang suka bubur tidak diaduk adalah 58 orang. Dari tabel, 23 orang adalah perempuan, maka jumlah laki-laki yang suka bubur tidak diaduk: $$58 - 23 = 35 \text{ laki-laki}$$ Total laki-laki adalah 40 orang, jadi jumlah laki-laki yang suka bubur diaduk adalah: $$40 - 35 = 5 \text{ laki-laki}$$ Sekarang, peluang Pak Eko Bramantyo (sebagai salah satu dari 100 orang) suka bubur tidak diaduk adalah: $$\text{Peluang} = \frac{\text{Jumlah orang suka bubur tidak diaduk}}{\text{Total orang}} = \frac{58}{100} = 58\%$$ Namun, kita diminta mencari peluang jika dia sudah berada dalam 42%, lebih ke tabel yang benar.	**The probability of Mr. Eko Bramantyo liking porridge that is not stirred** Given: - Total people: 100 - Those who like stirred porridge: men = ?, women = ? - Those who like unstirred porridge: men: 2 = ? Women: 23 - Total who likes unstirred porridge: 58 The number of people who like unstirred porridge is 58 people. From the table, 23 people are women, so the number of men is: **58 - 23 = 35 men**. The total number of men is 40 people, so the number of men is: **40 - 35 = 5 men.** Now, the probability of Mr. Eko Bramantyo (as one of 100 people) liking unstirred porridge is: **Probability = Number of people who like unstirred porridge / Total people = 58/100 = 58%**

Figure 7. ChatGPT's answers when uploading questions or data & uncertainty questions without the option

Dari gambar soal nomor 8, berikut adalah informasi yang tersedia: • Ramon melakukan survei pada penumpang Transjakarta dan mengumpulkan data terkait preferensi tentang bubur diaduk atau tidak diaduk. • Tabel survei menunjukkan data jumlah laki-laki dan perempuan, tetapi ada beberapa bagian yang belum diisi. • Total orang yang disurvei adalah 100 orang, di mana 58 orang suka bubur diaduk dan 23 orang suka bubur tidak diaduk. • Pertanyaannya adalah tentang peluang Pak Eko Bramantyo suka bubur tidak diaduk. Untuk menghitung peluang Pak Eko Bramantyo suka bubur tidak diaduk: • Total orang yang tidak suka bubur diaduk adalah 23. • Total orang yang disurvei adalah 100. Maka, peluang Pak Eko Bramantyo suka bubur tidak diaduk adalah: $$P = \frac{23}{100} = 0,23$$ Jadi, peluangnya adalah 23%.	From question number 8, the following information is available: - Ramon conducted a survey on Transjakarta passengers and collected data related to preferences regarding stirred or unstirred porridge. - The survey table shows the number of men and women, but some parts are still blank. - The total number of people surveyed is 100, of which 58 people like stirred porridge and 23 people like unstirred porridge. - The question is about the probability of Mr. Eko Bramantyo liking unstirred porridge. To calculate the probability of Mr. Eko Bramantyo liking unstirred porridge: - The total number of people who like unstirred porridge is 23. - The total number of people surveyed is 100. Therefore, the probability of Mr. Eko Bramantyo liking unstirred porridge is: **P = 23/100 = 0.23**

Figure 8. ChatGPT's answers when uploading questions or data & uncertainty questions with optional options

4. Algebra

The figure shows a ChatGPT conversation (in Indonesian on the left and English translation on the right):
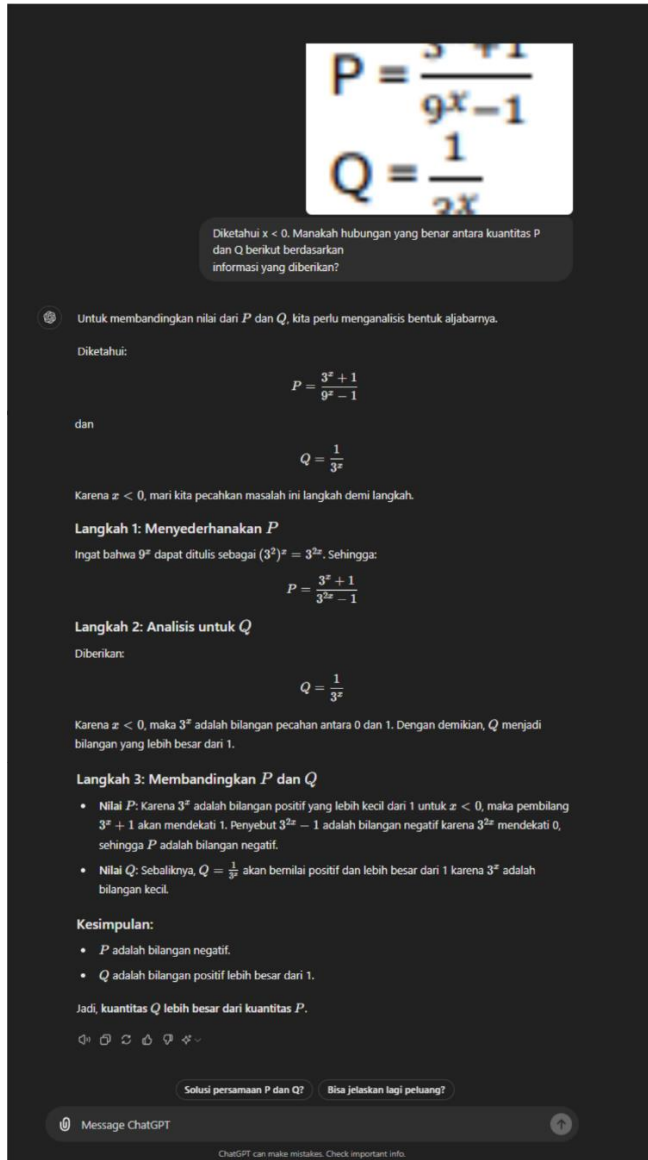
$$P = \frac{3^x + 1}{9^x - 1}$$

$$Q = \frac{1}{3^x}$$

Diketahui x < 0. Manakah hubungan yang benar antara kuantitas P dan Q berikut berdasarkan informasi yang diberikan?

Untuk membandingkan nilai dari P dan Q, kita perlu menganalisis bentuk aljabarnya.

Diketahui:

$$P = \frac{3^x + 1}{9^x - 1}$$

dan

$$Q = \frac{1}{3^x}$$

Karena $x < 0$, mari kita pecahkan masalah ini langkah demi langkah.

Langkah 1: Menyederhanakan P

Ingat bahwa 9^x dapat ditulis sebagai $(3^2)^x = 3^{2x}$. Sehingga:

$$P = \frac{3^x + 1}{3^{2x} - 1}$$

Langkah 2: Analisis untuk Q

Diberikan:

$$Q = \frac{1}{3^x}$$

Karena $x < 0$, maka 3^x adalah bilangan pecahan antara 0 dan 1. Dengan demikian, Q menjadi bilangan yang lebih besar dari 1.

Langkah 3: Membandingkan P dan Q

- **Nilai P:** Karena 3^x adalah bilangan positif yang lebih kecil dari 1 untuk $x < 0$, maka pembilang $3^x + 1$ akan mendekati 1. Penyebut $3^{2x} - 1$ adalah bilangan negatif karena 3^{2x} mendekati 0, sehingga P adalah bilangan negatif.
- **Nilai Q:** Sebaliknya, $Q = \frac{1}{3^x}$ akan bernilai positif dan lebih besar dari 1 karena 3^x adalah bilangan kecil.

Kesimpulan:

- P adalah bilangan negatif.
- Q adalah bilangan positif lebih besar dari 1.

Jadi, **kuantitas Q lebih besar dari kuantitas P.**

Solusi persamaan P dan Q?   Bisa jelaskan lagi peluang?

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Given P = (3^x + 1) / (9^x - 1) and Q = 1 / (2x), where x < 0, which of the following relationships between P and Q is correct based on the given information?

To compare the values of P and Q, we need to analyze the algebraic form.

Given:

P = (3^x + 1) / (9^x - 1)

and

Q = 1 / (2x)

Step 1: Simplifying P

Recall that 9^x can be written as (3^2)^x = 3^(2x). Therefore:

P = (3^x + 1) / (3^(2x) - 1)

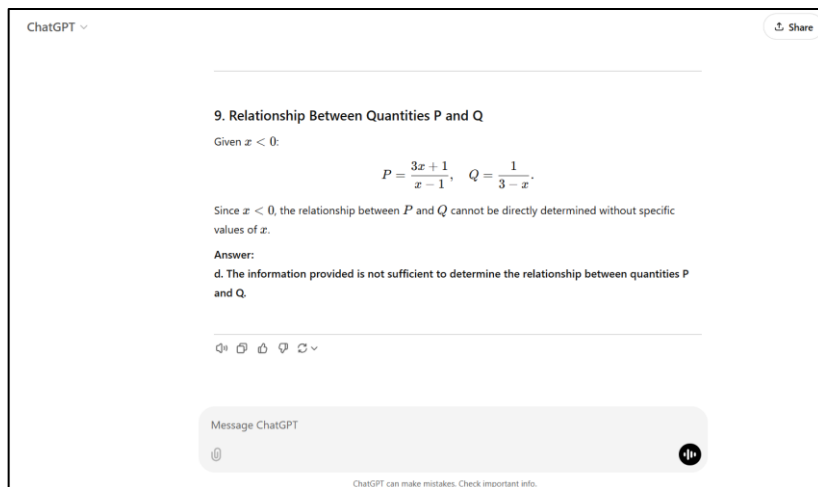**Step 2: Analysis for Q**

Given:

Q = 1 / (2x)

Since x < 0, 3^x is a fraction between 0 and 1. Thus, Q becomes a number greater than 1.

Step 3: Comparing P and Q

- Value of P: Because x < 0, the numerator (3^x + 1) is less than 1, and the denominator (3^(2x) - 1) is negative. Therefore, P is negative.
- Comparison: Since P is negative and Q is greater than 1, we can conclude that Q > P.

Therefore, the correct relationship between P and Q is Q > P.

Figure 9. ChatGPT's answer when uploading an algebra question or question without an option

The figure shows a ChatGPT conversation:

9. Relationship Between Quantities P and Q

Given $x < 0$:

$$P = \frac{3x + 1}{x - 1}, \quad Q = \frac{1}{3 - x}.$$

Since $x < 0$, the relationship between P and Q cannot be directly determined without specific values of x.

Answer:

d. The information provided is not sufficient to determine the relationship between quantities P and Q.

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Figure 10. ChatGPT's answer when uploading an algebra question or problem with optional options