## **1. Prompt Design**

### **1.1 Objective**

To generate a **college-level mathematics quiz** with **10 multiple-choice questions (MCQs)**, including correct answers, suitable for academic use.

### **1.2 Prompt Components**

The prompt provided to the model had four clearly defined elements:

* **Subject**: Mathematics
* **Level**: College students
* **Format**: MCQs
* **Length**: 10 questions

**User Input Prompt:**

*"subject: maths, level: college students, format: mcqs, length: 10"*

This structured input allowed the model to interpret constraints effectively.

### **1.3 Prompt Design Considerations**

* **Clarity**: The subject and target audience (college students) were explicitly stated, avoiding ambiguity.
* **Specificity**: The format (MCQs) and length (10 questions) were fixed, guiding the model to avoid generating open-ended or mismatched question types.
* **Scope Control**: Limiting to 10 questions ensured depth and variety without overwhelming content.

## **2. Output Evaluation**

### **2.1 Criteria for Evaluation**

The generated quiz was evaluated against the following dimensions:

1. **Relevance** – Are the questions appropriate for college-level mathematics?
2. **Accuracy** – Are the answers correct and mathematically valid?
3. **Variety** – Does the quiz cover different topics within mathematics?
4. **Clarity** – Are the questions and options clearly worded?
5. **Usability** – Is the format suitable for direct academic or practice use?

### **2.2 Evaluation of Generated Quiz**

* **Relevance** ✅  
  + Questions included key college-level math topics: linear algebra, calculus, probability, complex numbers, series, Laplace transform, and differential equations.
* **Accuracy** ✅  
  + All provided answers were mathematically correct (e.g., det⁡(A)=−2\det(A) = -2det(A)=−2, ∣3+4i∣=5|3+4i|=5∣3+4i∣=5, integral of sin⁡(x)\sin(x)sin(x) = 2).
* **Variety** ✅  
  + Covered **8 different areas** of mathematics instead of focusing only on one (balanced coverage).
* **Clarity** ✅  
  + Each question was concise, options were well-structured, and formatting was consistent.
* **Usability** ✅  
  + The output is ready-to-use in exams, assignments, or practice sessions.

### **2.3 Identified Strengths**

* **Balanced difficulty**: Not too easy (like high-school level) but approachable for undergrads.
* **Self-contained**: Each question has complete information; no missing context.
* **Answer key included**: Saves time for instructors.

### **2.4 Areas for Improvement**

* **Difficulty variation**: Could include at least 2–3 challenging questions for higher rigor (e.g., proofs, applied problems).
* **Randomization**: Current order is predictable (linear topics first → applied topics later). Could shuffle topics for variety.
* **Explanations**: Providing short explanations for answers would enhance the learning value.

## **3. Conclusion**

The designed prompt successfully generated a **high-quality 10-question college-level math quiz** in MCQ format. The output met expectations in terms of **accuracy, relevance, and usability**. With slight refinements (adding detailed solutions or randomized sequencing), this output can be directly integrated into **classroom quizzes, online practice platforms, or exam prep resources**.