1. Previous Mathematics Teaching and Learning Experiences

Reflect on your past experiences in learning and/or teaching math. Mention specific teaching methods you encountered, such as:

Lecture: Discuss whether lessons were primarily teacher-centered and focused on direct instruction.

Active Learning: Highlight group work, discussions, or problem-solving activities that involved collaboration.

Projects: Mention if you participated in real-world applications or long-term math-related projects.

Drill and Practice: Reflect on exercises aimed at building fluency with concepts or skills.

For example:

"In my past mathematics education, the teaching often relied heavily on lectures and drill-based practice, with minimal opportunities for active learning. However, group work and collaborative problem-solving, when included, helped me better understand complex topics and see different perspectives."

2. Zone of Proximal Development (ZPD)

Define the ZPD as the gap between what a learner can do independently and what they can achieve with guidance. For example:

"The Zone of Proximal Development (ZPD) is the range of tasks that a learner can perform with assistance but cannot yet complete independently. It highlights the importance of providing appropriate support, like hints or scaffolding, to help students progress."

3. Constructivism

Explain constructivism in your own words. For example:

"Constructivism is a learning theory that suggests knowledge is constructed by learners as they actively engage with concepts and ideas, rather than passively receiving information. In mathematics, this means students learn best when they explore, reason, and solve problems in meaningful ways."

4. Strategies to Understand Someone's Thinking

Describe three strategies that provide insight into a person's thinking:

Ask Open-Ended Questions: For example, "Why did you choose this method?" encourages the learner to explain their reasoning.

Analyze Work Samples: Review a student’s problem-solving steps to understand their thought process.

Use Think-Aloud Protocols: Ask the learner to verbalize their thought process while solving a problem.

"These strategies help uncover not only what the learner knows but also how they approach problems, revealing their strengths and misconceptions."

5. Experiences Contributing to Your Mathematics Knowledge

Identify experiences that shaped your understanding of math, such as:

A specific teacher or class that inspired you.

Participation in group discussions or competitions.

Real-world applications of math in projects or daily life.

"For me, participating in math competitions and solving real-world problems in projects significantly shaped my understanding. These experiences showed me the practical side of mathematics and deepened my interest."

6. Demonstrating Constructivism in Tutoring

Explain how you could apply constructivism in tutoring. For example:

"To demonstrate constructivism in tutoring, I would encourage students to solve problems using their own methods first and then guide them to refine their approach. I would use real-life examples to make concepts relevant and promote active participation by asking questions that prompt exploration and critical thinking."