

Art of Problem Solving Problem Sets

Purpose, Structure, and Expectations

Why We Use These Sets

These problem sets are designed to help you become a stronger, more independent mathematical thinker. They are **not** simply extra pages of routine practice. The goal is to learn how to begin when a method is not obvious, make connections, test ideas, and explain why a solution works.

Some problems should feel challenging. Productive struggle is part of the assignment: you may need to try an example, draw a diagram, organize information, revise an approach, or return to a problem later. Getting stuck does not mean that you are failing. It means that you have reached the part where problem solving begins.

How Each Set Is Structured

The problems follow the topic we are studying, but they become more demanding as the set progresses.

- **Build access.** Early problems help you enter the topic and notice useful relationships.
- **Develop structure.** Middle problems require you to connect ideas, choose a strategy, or solve in more than one step.
- **Extend your thinking.** Later problems may ask you to generalize, justify, find an efficient method, or solve an unfamiliar application.

A set is meant to be worked on over time. Your teacher may select particular problems for classwork, homework, discussion, or continued work in your binder. Finishing quickly is less important than developing a clear and thoughtful solution.

A Productive Way to Work

1. **Understand the problem.** Identify what is known, what is unknown, and what the question is asking.
2. **Make a real first attempt.** Try a case, create a table, draw a picture, work backward, or connect the problem to something you already know.
3. **Record your thinking.** Show organized work on the page or on labeled graph paper. Keep useful false starts; they are evidence of your reasoning.
4. **Ask a focused question.** After a serious attempt, explain where your reasoning stopped instead of asking only, “How do I do this?”
5. **Revise and reflect.** Compare approaches, correct errors, and be ready to explain why your final method works.

What Success Looks Like

Persistence	You stay with a difficult problem and try more than one approach.
Clear reasoning	Your work allows another person to follow your mathematical thinking.
Good questions	You identify the specific idea, step, or assumption that needs attention.
Growth	You revisit problems and can solve more independently over time.

The goal is not to know the path immediately. The goal is to learn how to find one.