Section 1.3: Problem Solving

Polya’s Four-Step Method

**Step One:** Understand the problem.
**Step Two:** Devise a plan.
**Step Three:** Carry out the plan.
**Step Four:** Look back and check.
Step One: Understand the problem. Some examples:

- What are you trying to find?
- Do you understand all the terminology?
- What data is given?
- What limiting conditions must be worked around?
- Can you explain the question to someone else?
- Try to state the problem another way.
Step Two: Devise a plan.

Some strategies:

- Draw a picture or diagram.
- Look for a pattern.
- Make a list
- Use a table.
- Smart guess and check. (Keep notes of what you tried.)
- Solve a smaller similar problem.
- Look for a “catch” if the answer seems too obvious.
Step Three: *Carry out the plan.*

This is where you will solve your problem **and** state the answer.

State your answer as a complete sentence and put it in a box so that it is easy to find.
Step Four: *Look back and check.*

This step involves **more** than just checking your answer, although that’s part of it. Some other things to consider:

- Recheck the result and arguments used.
- Does the answer make sense? If not, recheck the method and the calculations.
- Was there another way to solve this?
- Can you see that your solution is right?
- Can you get the result in a different way?
- Can you use this for another problem?
Example. Solve the following problem using Polya's Four-Step Method. Explain your solution as a step-by-step process, listing each of the four steps in the appropriate place and describing briefly how you applied each step to the problem. Answer using complete sentences.

How many fenceposts are needed to support a 100-meter long fence, if a fencepost must be used every 2 meters?
Understand the Problem:
Devise a Plan:
Carry out the plan:
Look back and check:
Example. Solve the following problem using Polya's Four-Step Method. Explain your solution as a step-by-step process, listing each of the four steps in the appropriate place and describing briefly how you applied each step to the problem. Answer using complete sentences.

A zookeeper is moving penguins and polar bears into their new exhibit. He counts 20 heads and 58 feet. How many penguins and how many polar bears are in the exhibit?
Understand the Problem:
Devise a Plan:
Carry out the plan:
Look back and check: