

# USING A PROBLEM SOLVING PROCESS

# FUN-DAMENTALS

In George Palya's book, *How To Solve It*, he teaches four basic principles of problem solving. Using these basic steps is how mathematicians do their work. Remember to be fearless when problem solving. Take risks. Even professional mathematicians make mistakes. Mistakes will help you learn and ultimately will help you be successful as you continue to grow and learn.

## STEP 5 — UTILIZE YOUR SKILLS

Now that you've effectively solved the problem, continue to use your skills. You can do this by starting another problem, explaining how you got your solution to a peer, or working through past problems that gave you trouble. The point is you want to keep practicing what you've done to solidify your learning because it's likely you'll be tested on this stuff. Learn it to the point that you can't get it wrong.

## STEP 4 — REFLECT

After you've reached a solution, it's time to look back on your problem-solving process. Examine your answer. Think about what worked and what didn't while you were working through it. Taking the time to do this will set you up with information that can help you predict what strategy to use as you go to solve future problems.

Adapted from "Polya's Problem Solving Techniques," (2012), which was retrieved from <http://math.berkeley.edu/~qmelvin/polya.pdf> and which references the following: Polya, G. (1957). *How to solve it: a new aspect of mathematical method* (2nd ed.). Princeton, NJ: Princeton University Press.

## STEP 1 — UNDERSTAND THE PROBLEM

The first step to problem-solving is making sure that you understand the problem. Ask yourself: Do I understand all the words used in the problem? What am I being asked to find or show? What might the answer look like? Can I restate the problem in my own words? Is there a picture or diagram that will help me understand the problem?

## STEP 2 — DEVISE A PLAN

Make a plan to help you find a solution. To do this, find the connection between the information you have and what you don't know. Have you seen a problem like this before? Can you think of a theorem that could be useful? What might the answer look like when you're done? Consider using the strategies of guess and check, solving a simpler problem, finding a similar problem to start from, working backwards, etc.

## STEP 3 — CARRY OUT THE PLAN

Use the plan you've chosen. Be patient with yourself and pause at each step. Can you see that your answer is headed in the right direction? If so, carry on, and if not, try to determine why/choose another plan. Use what you learn as you're working to inform your next choice

