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PROBLEM-SOLVING IN JOB SEEKING

Learning Package – AIMlearning Project

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INTRODUCTION

Imagine the following situation:

You are running late for an important meeting, such as a job interview. Your phone battery is low, and the bus you were planning to take has been cancelled due to a flat tire. What do you do?

In situations like this, what matters is not only the situation itself, but how you respond to it. Problem-solving skills help you make decisions, find alternative solutions, and cope with unexpected situations in your studies, working life, and everyday life.

Problem solving is one of the most important skills for the future. It enables you to operate in a constantly changing world, develop your own thinking, and find solutions to situations where ready-made answers may not exist.

With this material, developed as part of the AIMlearning project, you will have the opportunity to explore your own ways of solving problems and practice skills that are useful in different areas of life.

AIMlearning is a project co-funded by the European Union. Its goal is to support young people under the age of 29 living in Central Ostrobothnia, students and unemployed job seekers, on their path toward working life and further education. The project also aims to support the development of their skills through learning packets related to sustainability, artificial intelligence, data analytics, cybersecurity, and well-being.

The project is implemented in cooperation between Centria University of Applied Sciences and The Federation of Education in Central Ostrobothnia, Kpedu during the period 01.04.2024 – 30.04.2027. More information about the project and other learning packets can be found at https://aimlearning.fi/en/.

This material utilises AI in the search for sources, the drafting of the text, and the translation of the text.

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WHAT ARE PROBLEM-SOLVING SKILLS?

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Problem-solving skills refer to the ability to face different kinds of challenges, examine them from multiple perspectives, and find effective solutions.

Problem solving is not just a single skill, but a broader set of abilities that includes thinking, action, information gathering, and interaction skills. These are essential competencies that young people will need in their everyday lives, in their studies, and in their future careers.

For example, planning how to use time effectively, making decisions, or resolving conflicts are all situations where problem-solving skills play a key role. Problem-solving skills consist of several interconnected abilities.

GEORGE PÓLYA'S PROBLEM-SOLVING MODEL

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One of the most well-known problem-solving models was developed by the Hungarian mathematician **George Pólya** (1887–1985). The model is based on the idea that problems can be solved systematically by progressing step by step.

Pólya's model is not limited to mathematics; it can also be applied in fields such as design and other areas where complex and difficult problems are encountered.

Often, the most challenging part of problem solving is not finding the solution itself but clearly understanding and defining the problem. For this reason, Pólya's model emphasizes that a successful solution begins with a careful analysis and understanding of the problem.

Pólya's model is still widely used across different fields, such as education, design, and working life.

Pólya's Problem-Solving Process

Pólya's model is divided into four main phases:

1. Understand the problem

» In this phase, the goal is to understand what the problem is about.
» You can reflect on questions such as:
  ◦ What do you already know about the situation?
  ◦ What do you need to find out?
  ◦ What additional information do you need?
  ◦ Is any important information missing?
» Understanding the problem is essential, because without it, finding a solution can be difficult. Problems often seem challenging simply because they have not been defined clearly enough.

2. Devise a plan

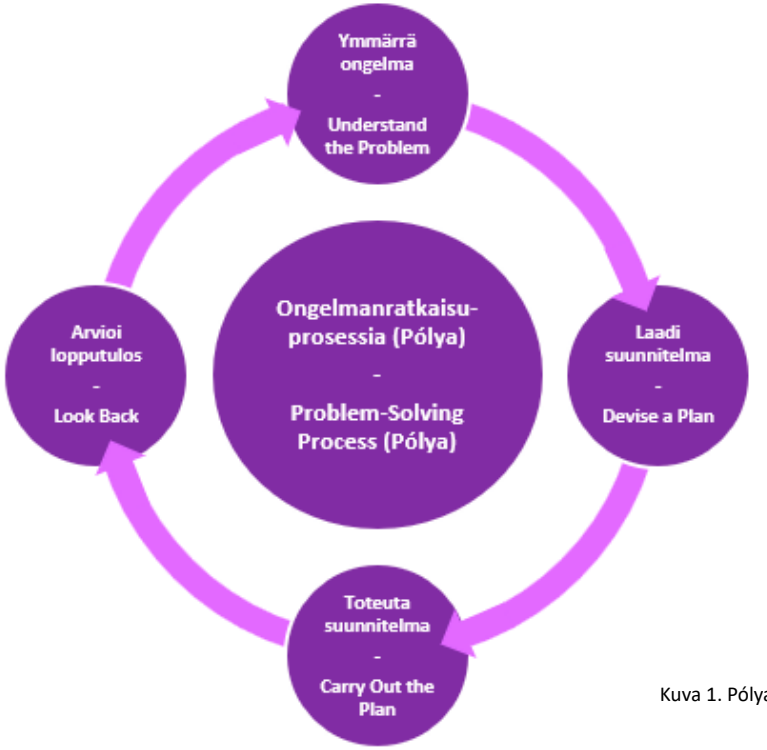
» Once the problem has been understood, the next step is to think about how it could be solved.
» At this stage, you aim to:
  ◦ identify possible solutions
  ◦ make use of previous experiences and solutions
  ◦ break the problem into smaller parts
  ◦ create a solution plan by moving from known information toward the unknown through reasoning and connections
» The goal is to find an approach that helps you move toward a solution.

3. Carry out the plan

» In this phase, the plan created earlier is put into action.
» This includes:
  ◦ working step by step
  ◦ ensuring that the solution works
  ◦ modifying the plan if necessary
» Often, the solution becomes clearer only during implementation, and your understanding of the problem may deepen as the process progresses.

4. Look back (evaluation)

» Finally, you evaluate how well the solution works.
» You can reflect on questions such as:
  ◦ Was the problem solved?
  ◦ Could the solution be improved?
  ◦ Can the same approach be used in other situations?
» Evaluation helps you learn from the situation and develop your problem-solving skills.



Kuva 1. Pólyan ongelmanratkaisuprosessi.

Successful problem solving requires going through all four phases. Even if a solution seems to appear quickly, it is important to verify its effectiveness by systematically working through each step. This helps ensure that the solution addresses the right problem.

Often, the challenge is not a poor solution, but rather a problem that has been defined too narrowly. Defining the problem and developing the solution therefore go hand in hand, and a good solution is often the result of several iterative cycles of refinement.

Writing down your ideas in a visible form makes it easier to examine and develop them further, especially in group settings. In addition, motivation plays an important role in problem solving: a task that is suitably challenging and interesting supports learning and helps maintain engagement. Problems that are too easy or too difficult, on the other hand, may reduce motivation to try.

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GRAHAM WALLAS' PROBLEM-SOLVING MODEL

Another well-known problem-solving model, and one of the most recognized models emphasizing creative thinking, was developed by the British psychologist **Graham Wallas** (1858–1932). In this model, he describes creative problem solving as a process consisting of several successive stages.

Wallas' model focuses particularly on how ideas emerge in the human mind. Unlike more structured approaches, it highlights that problem solving is not always linear. Instead, it involves thinking, pauses, and gradually developing insights. The model is based on the idea that creativity does not arise solely from momentary inspiration but is a complex process that involves both conscious thinking and unconscious mental processes.

Wallas also emphasizes that finding a solution can take time. Ideas do not always appear immediately; they may develop gradually or emerge suddenly as a so-called "aha moment." For this reason, taking breaks and allowing ideas to "incubate" are an essential part of creative problem solving.

Wallas' Problem Solving Process

In Wallas' model, problem solving is seen as a creative process. The process is not always linear; it also involves pauses, reflection, and insights.

Wallas' model is divided into four phases:

1. Preparation

» The problem is examined, and efforts are made to gather relevant information
  ◦ What is the problem?
  ◦ What is already known about it?
  ◦ What additional information is needed?
» The aim is to understand the situation as thoroughly as possible. The better the problem is understood, the better the chances of finding an effective solution.

2. Incuvation

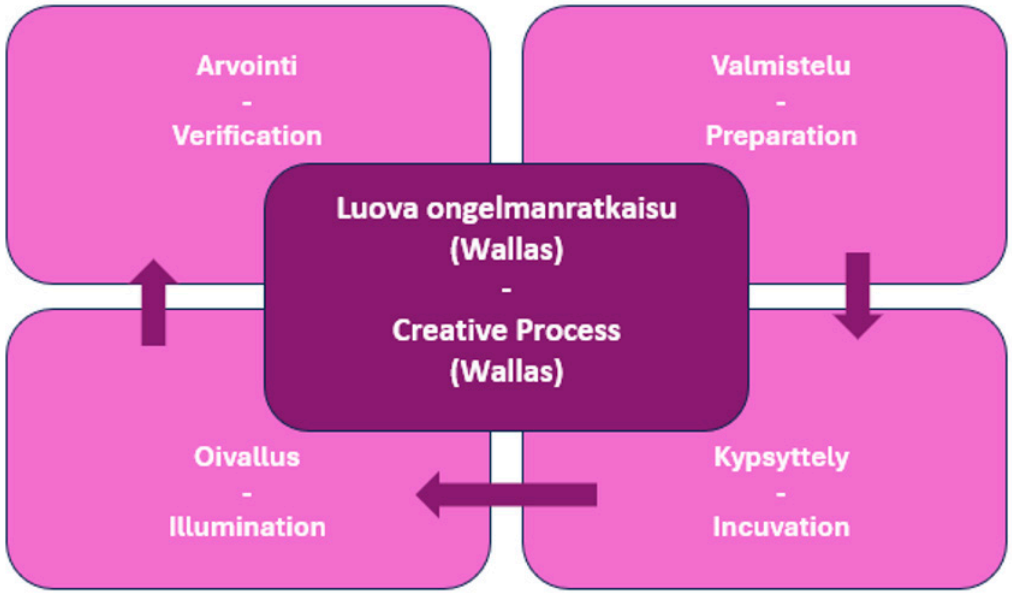
» Next, some distance is taken from the problem. Instead of actively working on it, the mind is allowed to "incubate" ideas.
» This may involve:
  ◦ taking a break
  ◦ focusing on something else
  ◦ resting or engaging in physical activity
» Even though the problem is not consciously considered, the subconscious mind continues working on it in the background.

3. Illumination

» In this phase, a solution or idea begins to emerge.
» It may appear suddenly, even while doing something completely unrelated
  ◦ This is often described as an "aha" or "eureka" moment
» However, insight does not come out of nowhere—it is based on the thinking and information processing that occurred in earlier phases.
» This phase is often the most rewarding, as it is associated with a strong sense of success and satisfaction. It can feel like a reward for the effort and thinking that has been invested.
» What makes this stage especially meaningful is that the solution has been discovered through one's own thought process—often in a completely new way that has not been tried before.

4. Verification / Evaluation

» In the final phase, the solution is examined critically.
  ◦ Does the solution work in practice?
  ◦ Did it address the original problem?
  ◦ Can it be improved further?
» At this stage, the solution is tested and, if necessary, refined. It may also be rejected if it turns out not to be effective.



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SIMILARITIES AND DIFFERENCES BETWEEN PÓLYA'S AND WALLAS' MODELS

Both Pólya's and Wallas' models describe problem solving as a process, but they approach it from slightly different perspectives.

Similarities

In both models, problem solving is seen as a step-by-step process in which you gradually move toward a solution. Although the names and emphasis of the phases differ, similar stages can be identified in both models, such as::

- becoming familiar with and understanding the problem
- developing a solution
- evaluating the solution

In addition, both models emphasize that:

- solving a problem requires time and careful thinking
- the first solution is not necessarily the best one
- it is important to evaluate how well the solution works

Overall, both models help structure thinking and support effective problem solving.

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Differences

Pólya's Model

» emphasizes systematic and logical progression
» focuses on what is done in practice and in concrete terms
» works well in situations where the problem can be clearly defined

Examples:

» learning tasks
» everyday decision-making situations
» technical or clearly defined problems

Walla's Model

» emphasizes creative thinking and insights
» focuses on how ideas are formed in the mind
» takes into account the role of the subconscious and the importance of breaks

Examples:

» ideation and development work
» creative projects
» situations where there is no single correct solution

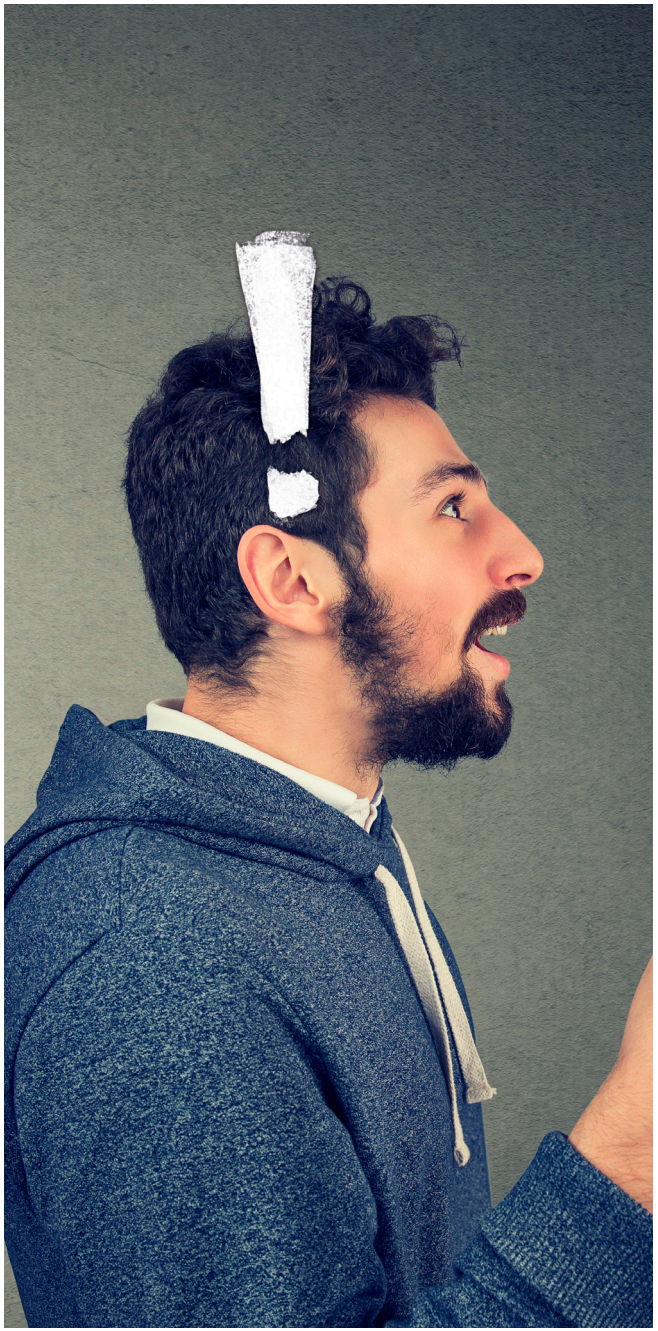
In what situations do these models work best?

In practice, the models do not exclude each other, instead, they complement one another.

Pólya's model is well suited for situations where a clear structure and a concrete solution are needed. Wallas' model, in turn, helps to understand creative thinking and supports the generation of new ideas.

In many cases, the best outcome is achieved by combining both approaches: creative thinking can first be used to generate ideas, after which the solutions can be structured and developed in a more systematic way.

The most important thing is to confidently try out different methods and find the approaches to problem solving that work best for you.



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THREE-STEP APPROACH TO PROBLEM-SOLVING

Problem solving can also be approached using a simpler model. One way is to divide it into three key components:

1. Initial state

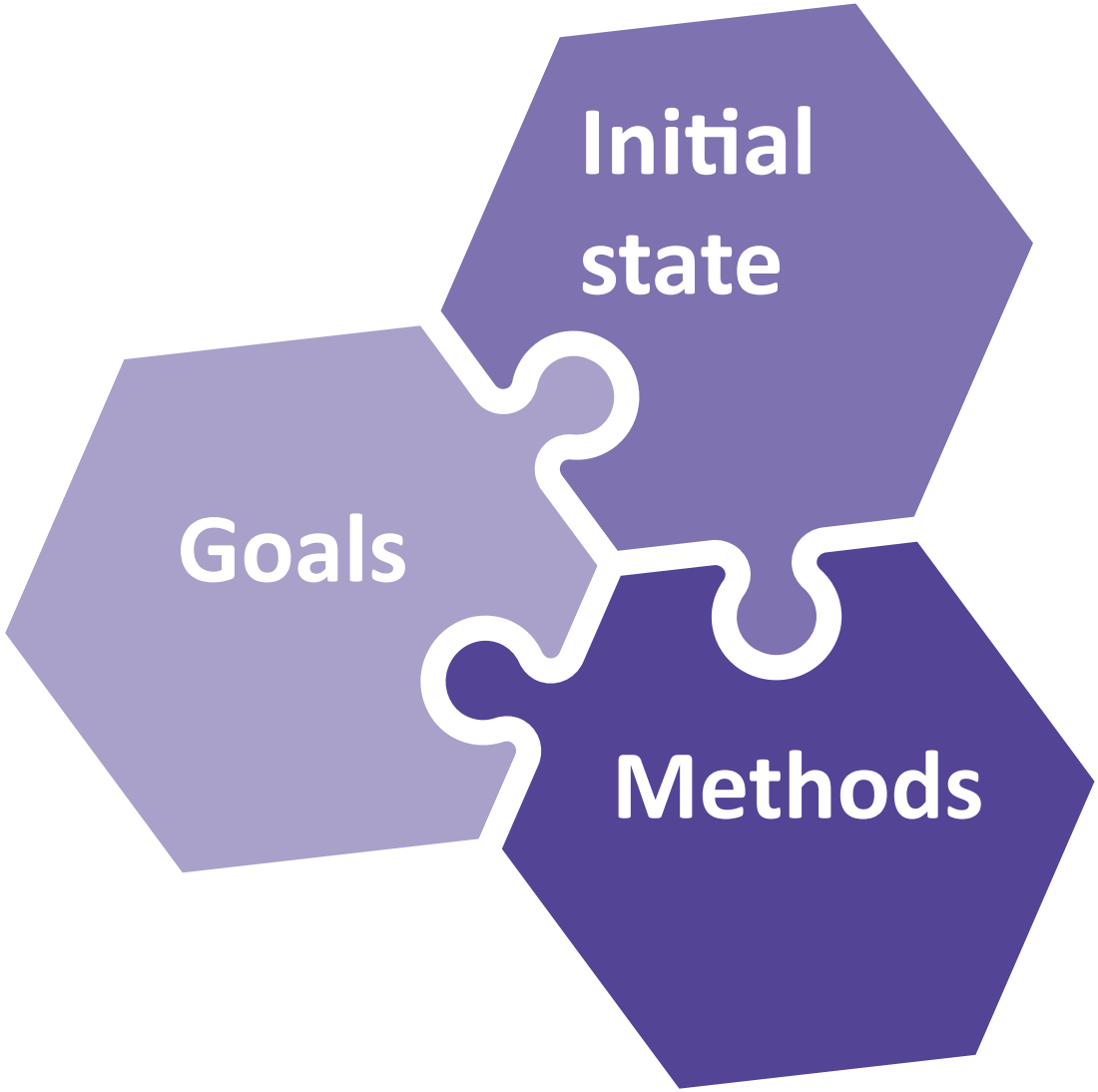
» Define the problem (What is the issue?)
» The goal is to understand what the situation is about and what is preventing the desired outcome from being achieved.
» It is essential to identify the starting point of the problem as clearly as possible.

2. Methods

» Identify ways to solve the problem (How can the problem be solved?)
» This stage involves considering different alternatives and choosing suitable approaches

3. Goals

» Once effective solutions have been identified, you can move toward the desired outcome, where the problem is solved or the situation has improved.



STRATEGIC PROBLEM-SOLVING

Problem solving can also be approached from a strategic perspective.

Strategic problem solving means that problems are not addressed randomly, but are approached in a goal-oriented and systematic way.

Strategic problem solving is based on three key stages:

1. Defining the problem

» The problem is defined clearly and precisely.
» Before searching for a solution, it is important to understand what the problem is really about.
» You can reflect on questions such as:
  ◦ What does the problem involve?
  ◦ Where and when does it occur?
  ◦ What is the underlying cause?
» Carefully defining the problem is essential, because an incorrectly defined problem can easily lead to ineffective solutions.

2. Setting the goal

» Once the problem has been understood, the next step is to define the goal.
» The focus is not only on the problem but also on what kind of outcome is desired.
» For example:
  ◦ What do I want to change in this situation?
  ◦ What would be a good outcome?
» A clear goal helps guide your actions and increases motivation. It can also help keep stress levels lower.

3. Taking action / Implementing the solution

» A suitable approach is chosen, and action is taken to solve the problem.
  ◦ selecting a strategy that leads toward the best outcome
  ◦ trying out different solutions
  ◦ progressing toward the goal
» The key is to find an approach that fits the situation and helps achieve the desired outcome.

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EXERCISES AND ACTIVITIES TO STRENGTHEN PROBLEM-SOLVING SKILLS

Exercise 1

Create a mind map or a diagram that shows how the problem-solving process progresses in your opinion. The aim of this task is to help you understand how problem solving develops step by step. Use a real-life example, like job seeking, studying or an everyday problem

You can create your diagram on paper, or using digital tools (e.g. Paint, PowerPoint, Visual Studio)

Use both Pólya's and Wallas' models to support your planning.

Exercise 2

Now for a task that requires a bit of logical thinking.

What is the parking space number of the purple car?

The correct answer can be found after the references.

This task is based on a logic puzzle from the RyhmäRenki website, which has been modified for this learning material. The original task is available at: https://ryhmarenki.fi/paattelypahkinat/.

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Exercise 3

Find a job advertisement online that interests you (e.g. on Duunitori or Työmarkkinatori).

If needed, you may also create a suitable job advertisement using AI.

Based on the advertisement, identify what kind of problem the employer is trying to solve (i.e. why they are hiring a new employee).

Examples:

- Customers are not being served sufficiently (staff shortage)
- The team needs specific skills that they currently lack or do not have enough of
- The organization is expanding

Consider how you could help the company solve this problem.

Examples:

- I have experience in their field as well as in customer service
- I can provide the programming skills they are looking for

After these, start write a short job application text (3–5 sentences), such as a cover letter or CV profile text. In your text, describe your skills and experience, connect them to the employer's needs and explain how you can help solve their problem

Example:

- *I have several years of experience in customer service and I'm used to working in fast-paced environments. I can provide friendly and efficient service, supporting your company's goal of delivering high-quality customer experiences. I am also highly motivated to learn more about your field and further develop my skills.*

Include the following in your response

- The job advertisement you chose
- The problem the company is trying to solve
- Your response: how your skills and experience help solve that problem

Don't just list your skills. explain how you plan to use them

Think about your answer from the perspective of how it might benefit your potential employer.

Concrete examples are also better than general statements, so be sure to include them. Also, remember to write clearly and accurately.

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Exercise 4

Below you will find a few example scenarios. Your task is to consider which of the problem-solving models presented earlier (Pólya and Wallas) is better suited to solving the problem in question. As a reminder:

- Pólya's model -> Systematic approach
- Wallas's model -> Creative thinking and brainstorming

Below are examples of job-search situations.

- A. I'm not getting any job interview invitations, even though I've sent the same application to several different places.
- B. I don't know where to find a job that suits me
- C. My applications don't stand out enough from other applicants.
- D. Job interviews make me nervous.
- E. Writing a resume is challenging for me; I want to make it more appealing.

In your answer,

- which problem-solving model you would use, and explain why you chose that model and how it would help in this situation.
  - Why did you choose that model?
  - How does it help solve the problem?
- Describe how you would apply this model in practice (to solve the problem).
  - What would you do step by step?

Also consider whether a three-step / simplified model might be suitable for solving the problem.

Image: Adobe Stock

SOURCES

Cathcart, D. 2007. Polya's problem solving methods. Salisbury University. Saatavissa: https://faculty.salisbury.edu/~dccathcart/MathReasoning/Polya.html.

GIOCT. 2023. Thinking outside the box. Saatavissa: https://gioct.org/thinking-outside-the-box/.

Laine, A., Vessonen, T., Väisänen, E. & Hellstrand, H. 2024. Opas ongelmanratkaisuun. Helsinki: Helsingin yliopisto. Saatavissa: https://www.helsinki.fi/assets/drupal/2024-12/Opas%20ongelmanratkaisuun%2013.11.%20versio.pdf.

Mielen Ihmeet. 2021. Graham Wallas ja luovan prosessin neljä vaihetta.

Saatavissa: https://mielenihmeet.fi/graham-wallas-ja-luovan-prosessin-nelja-vaihetta/.

Mielen Ihmeet. 2021. Strategioita ongelmanratkaisuun.

Saatavissa: https://mielenihmeet.fi/strategioita-ongelmanratkaisuun/.

Nuori.fi. 2024. Ongelmanratkaisutaidot. Saatavissa: https://nuori.fi/tet-oppimateriaalit/tet-ongelmanratkaisutaidot/.

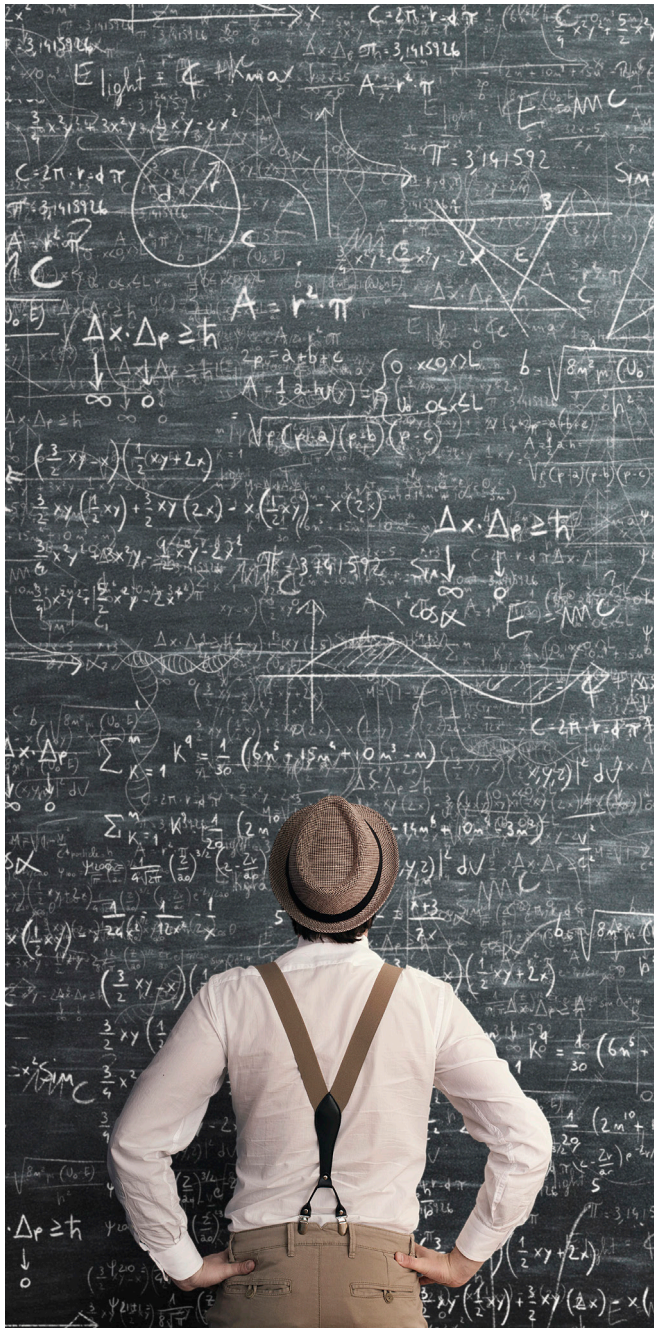
Nyyti ry. 2024. Ongelmanratkaisu. Saatavissa: https://www.nyyti.fi/ongelmanratkaisu/.

Polut-julkaisu (Media Lab Helsinki). 2017. Ongelmanratkaisu. Saatavissa: https://mlab.taik.fi/polut/Design/tyokalu_ongelmanratkaisu.html.

RyhmäRenki. 2026. Päättelypähkinät. Saatavissa: https://ryhmarenki.fi/paattelypahkinat/.

TET.fi. 2024. Ongelmanratkaisutaidot. Saatavissa: https://tet.fi/nuorille/ongelmanratkaisutaidot/.

Answer to Exercise 2: 87



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