



Sapientia
Academy

Sapientia Practice Worksheets

Secondary 5 – SO Mathematics

Overview Document (English Version)

Introducing Sapienta Practice Worksheets

What are Sapienta Practice Worksheets ?

Sapienta Practice Worksheets are designed to build and refine the *skills* students need in mathematics through a carefully structured collection of problems. These worksheets do not replace conceptual learning—they *strengthen* it by providing the practice necessary to turn understanding into mastery.

Each worksheet set includes :

- A **micro-classified sequence** of problems
- Gradual skill progression from simple to multi-step tasks
- Targeted exercises that isolate key techniques
- High-quality, exam-aligned questions designed by expert educators

Every problem is intentional : no clutter, no filler—only the skills students truly need to excel.

Who should use these worksheets ?

- **Students** who want focused, structured practice to improve fluency
- **Tutors** who need ready-to-use problem sets for efficient sessions
- **Teachers** who want supplemental material aligned with QEP expectations

These sheets are also ideal for in-class practice, homework reinforcement, or targeted skill development.

How to Use This Document

Sapienta worksheets are built around one simple idea : **Skills grow through deliberate practice, not random repetition.**

For Students

- Start with early problems to warm up your skills
- Move to intermediate steps once you feel confident
- Finish with multi-step and challenge problems to build mastery
- If you're stuck, use **DiaLogos** to think through the steps—never to get the final answer

For Tutors and Teachers

- Use micro-classified topics to target the exact skill your student needs
- Combine basic and advanced problems to create differentiated instruction
- Encourage verbal reasoning before symbolic manipulation

Structure of each worksheet

1. Key skill introduction
2. Gradual build-up of techniques
3. Mixed problems
4. Multi-step and context problems

These worksheets help learners see the details, patterns, and strategies that appear in real evaluations.

Meet DiaLogos : Your Thought Partner in Math



When students are alone with their math thoughts, without a teacher, tutor, or classmate, learning can stall. That's where **DiaLogos** steps in.

What is DiaLogos?

DiaLogos is Sapienta's intelligent, dialogue-based, AI tutor assistant, designed to think *with* students, not for them.

Unlike regular chatbots, DiaLogos :

- **Doesn't give away the answers**
- **Asks questions that ignite student thinking**
- **Encourages reasoning, self-explanation, and curiosity**
- **Supports students when a human guide isn't around**

DiaLogos is developed by a team of Quebec-certified educators, mathematicians, and professional programmers. Its mission is to expand students' *cognitive boundaries* through meaningful, thought-provoking dialogue.

Unlike traditional chatbots that offer answers too quickly and short-circuit the learning process, **DiaLogos** is designed to foster agency and reflection. It doesn't give answers, it gives students better vision and helps them understand better.

DiaLogos is the first tutoring assistant in Quebec built not to replace real thinking, but to complete the learning process. Whether you're stuck on a concept or trying to deepen your understanding, this AI-powered tool guides you like a curious mentor : never giving too much, always nudging you further.

Use it when you're working independently, between tutoring sessions, or anytime you want to think more clearly, more deeply, and more confidently.

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- Worksheet 1 : Constraints and feasible regions
- Worksheet 2 : Optimization in two variables
- Worksheet 3 : Linear programming in applied contexts
- Worksheet 4 : Mixed problems

Chapter 2 – Real Functions with Basic Operations

- Worksheet 1 : Square root functions and their properties
- Worksheet 2 : Absolute value functions and transformations
- Worksheet 3 : Rational functions – behaviour and restrictions
- Worksheet 4 : Mixed problems

Chapter 3 – Exponential and Logarithmic Functions

- Worksheet 1 : Exponential models in real phenomena
- Worksheet 2 : Logarithms and inverses of exponential functions
- Worksheet 3 : Solving exponential and logarithmic equations
- Worksheet 4 : Mixed problems

Chapter 4 – Trigonometric Functions

- Worksheet 1 : Radian measure and periodicity
- Worksheet 2 : Sine, cosine, and tangent functions
- Worksheet 3 : Transformations of trigonometric functions
- Worksheet 4 : Solving trigonometric equations
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Chapter 5 – Conic Sections

- Worksheet 1 : Circles, ellipses, parabolas, and hyperbolas
- Worksheet 2 : Algebraic forms and geometric properties
- Worksheet 3 : Applications of conic sections in real contexts
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Chapter 6 – Vectors

- Worksheet 1 : Vector representation in the plane
- Worksheet 2 : Operations with vectors (addition, scalar multiplication)
- Worksheet 3 : Dot product and geometric interpretations
- Worksheet 4 : Applications to displacement and forces
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