

10 Tasks On Math Modeling

Introducing MATLAB into High School Mathematics

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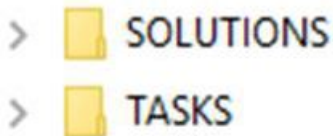
Course Details

Description

This curriculum package contains a collection of high school mathematics tasks. The 10 tasks are designed to be engaging for high school students and are relevant to secondary school curriculum. They have been used as assessment tasks for students in Years 11 and 12 in line with the Queensland Senior Mathematics Syllabus. The tasks provide a gentle introduction to the use of MATLAB in high school mathematics. MATLAB is the language of technical computing that is used in STEM courses in universities throughout the world. It makes good sense to give students experience in the MATLAB environment while they are still at high school.

Original Course Documents

The curriculum package contains content that is organised into 2 folders - a TASKS folder and a SOLUTIONS folder.



- The TASKS folder:
 - This folder contains all of the content that is intended for both **students and teachers**.
- The SOLUTIONS folder
 - This folder contains all of the content that is intended for **teachers only**. It contains the solutions to the tasks that the students are asked to do.

The TASKS folder:

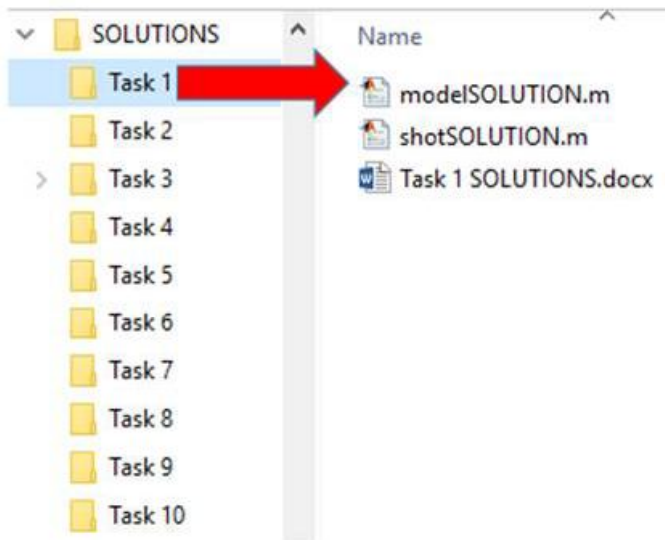
The TASKS folder contains content that is intended for both students and teachers. Inside the TASKS folder you will find a “[task booklet](#)” – this is a WORD document that contains the description of the 10 tasks (questions) that the students can work on.



The TASKS folder also contain the resources that the students will need for each of the 10 tasks introduced in the task booklet. These resources are stored in subfolders called “Task 1”, “Task 2”, etc. These folder contain a combination of slides, videos and MATLAB files that students can use as "starting points".

The SOLUTIONS folder:

The SOLUTIONS folder contains content that is intended for **teachers only**. It contains the solutions to the tasks that the students are asked to do. These solution resources are stored in subfolders called “Task 1”, “Task 2”, etc, and contain the MATLAB solution files for each Task. For example, the solution files for “Task 1” are shown below.



Course Contents

The mathematical topics covered in each of the 10 tasks are summarised below. Alongside each of these mathematical topics (in brackets), is the corresponding category in the [Australian Curriculum](#) (Senior secondary) that the mathematical topic connects to.

Task 1: Striving for Accuracy

- Functions and graphs (Mathematical Methods Unit 1 Topic 1)
- Introduction to differential calculus (Mathematical Methods Unit 2 Topic 3)

Task 2: Measuring Inequality

- Functions and graphs (Mathematical Methods Unit 1 Topic 1)
- Integrals (Mathematical Methods Unit 3 Topic 2)

Task 3: Cracking the Code

- Probability and relative frequency (Essential Mathematics Unit 4 Topic 1)
- Algebra and matrices (General Mathematics Unit 1 Topic 1)
- Discrete random variables (Mathematical Methods Unit 3 Topic 3)
- Matrices (Specialist Mathematics Unit 2 Topic 2)

Task 4: Uncle Albert's Legacy - A Tale of Growth and Diversity

- Functions and graphs (Mathematical Methods Unit 1 Topic 1)
- Matrices (Specialist Mathematics Unit 2 Topic 2)

Task 5: Bring Him Home

- Functions and graphs (Mathematical Methods Unit 1 Topic 1)
- Introduction to differential calculus (Mathematical Methods Unit 2 Topic 3)
- Matrices (Specialist Mathematics Unit 2 Topic 2)

Task 6: Caught in a Rip!

- Functions and graphs (Mathematical Methods Unit 1 Topic 1)
- Introduction to differential calculus (Mathematical Methods Unit 2 Topic 3)

Task 7: Flying high

- Functions and graphs (Mathematical Methods Unit 1 Topic 1)
- Introduction to differential calculus (Mathematical Methods Unit 2 Topic 3)

Task 8: Foolin' around with Fibonacci

- Growth and decay in sequences (General Mathematics Unit 3)
- Arithmetic and geometric sequences and series (Mathematical Methods Unit 2 Topic 2)

Task 9: Toyin' around with Triangles

- Growth and decay in sequences (General Mathematics Unit 3)
- Arithmetic and geometric sequences and series (Mathematical Methods Unit 2 Topic 2)

Task 10: Function Families

- Functions and graphs (Mathematical Methods Unit 1 Topic 1)



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