TECHNICAL UNIVERSITY OF DENMARK (DTU)

Course: Automated Reasoning

Course number: 02256

Exam duration: 2 hours

Aid allowed: All Aid — There will be no internet access during the exam.

Weighting: Stated for each problem

Isabelle2025 must be used. The files `MainProof.thy`, `MiniCalc.thy` and `Pure_HOL.thy` are the same as in the assignments in the course. Do not modify these 3 files in any way. Please do not hand in these 3 files (`MainProof.thy`, `MiniCalc.thy` and `Pure_HOL.thy`).

Note that use of Isabelle commands like "sorry" is a partial answer only. It is optional to hand in a PDF file. However, a PDF file may contain screenshots and other graphics, also of partial answers, but it can be omitted if the Isabelle files contain the full answers.

Problem 1 (30%)

Consider the following Isabelle file available together with the present PDF file:

`Exam_file_1_of_3.thy`

Answer the questions in the file by making changes to it and hand in the changed file.

Problem 2 (30%)

Consider the following Isabelle file available together with the present PDF file:

`Exam_file_2_of_3.thy`

Answer the questions in the file by making changes to it and hand in the changed file.

Problem 3 (40%)

Consider the following Isabelle file available together with the present PDF file:

`Exam_file_3_of_3.thy`

Answer the questions in the file by making changes to it and hand in the changed file.