Computer Algebra Independent Differential Equations Tests

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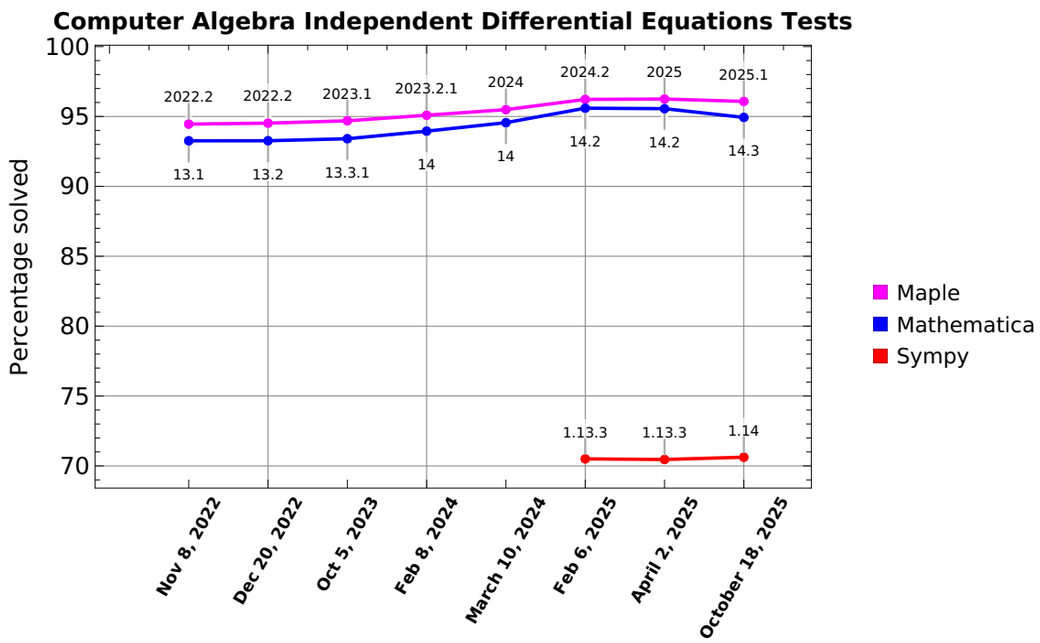
Contents

1 Snap shot of current results



This is the Mathematica notebook used to generate the above plot.

This table summarizes the data used to generate the above plot

Test date	Maple	Mathematica	Sympy	# ODE's
October 18, 2025	2025.1 (96.077%)	14.3 (94.932%)	1.14 (70.621%)	25,416
April 2, 2025	2025 (96.246%)	14.2 (95.558%)	1.13.3 (70.458%)	19,474
March 14, 2025	2024.2 (96.219%)	14.2 (95.592%)	1.13.3 (70.502%)	19,466
March 9, 2024	2024.0 (95.489%)	14.0 (94.577%)	N/A	15,472
February 8, 2024	2023.2.1 (95.089%)	14.0 (93.979%)	N/A	13,784
October 5, 2023	2023.1 (94.689%)	13.3.1 (93.407%)	N/A	10,997
December 20, 2022	2022.2 (94.521%)	13.2 (93.264%)	N/A	10,258
November 8, 2022	2022.2 (94.454%)	13.1 (93.260%)	N/A	10,044

Table 1: Data summary of all tests

2 Links to test reports

These reports show the result of running Maple and Mathematica and Sympy on my large collection of differential equations. Diagram illustrating the test system is below. Sympy was added on March 2025.

1. Maple 2025.1, Mathematica 14.3 and Sympy 1.14. Current version. Oct. 18, 2025.
2. Maple 2025, Mathematica 14.2 and Sympy 1.13.3. April 2, 2025.
3. Maple 2024.2, Mathematica 14.2 and Sympy 1.13.3. March 15, 2025.
4. Maple 2024 and Mathematica 14. March 9, 2024.
5. Maple 2023.2.1 and Mathematica 14. February 8, 2024.
6. Maple 2023.1 and Mathematica 13.3.1. October 5, 2023.
7. Maple 2022.2 and Mathematica 13.2. December 20, 2022.
8. Maple 2022.2 and Mathematica 13.1. November 8, 2022.

The command used for Maple is

```
dsolve(ode,y(x), singsol=all)
```

The command used for Mathematica is

```
DSolve[ode,y[x],x,IncludeSingularSolutions -> True]
```

The commands for sympy are also given in plain text for each problem in the report.

Each command was given 3 minutes of CPU time (not real time). If the command does not complete within this time it is counted as failed. in Mathematica TimeConstrained is used and in Maple timelimit is used. For sympy, timelimit is implemented using `subprocess` as shown here

3 Text books used

The text books used are listed on the page of my own ODE solver at this link ODE solver.

4 Design of the test program

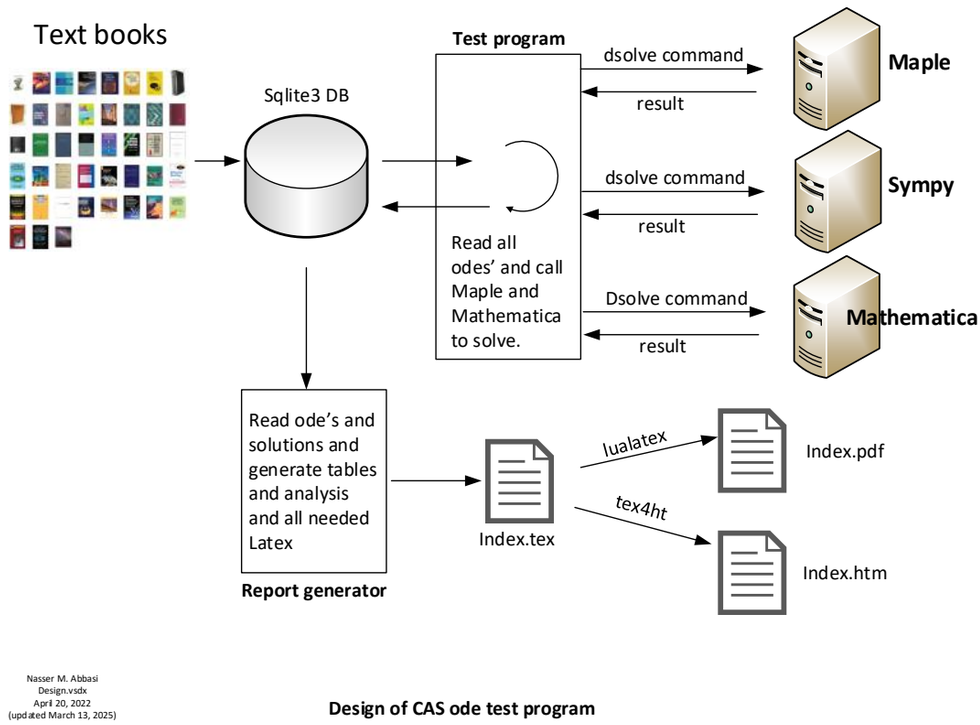


Figure 1: Design of the test program