( In each of the following problems use Maple commands for all operations )

1 / Solve the IVP and plot the solution in the interval [0.1, 6]

\[ y' + \csc(t)y = \sec(t/2), \quad y(\pi/2) = 0 \]

( Compare with the solution obtained directly by formula 33 section 2.1 and explain the problem at \( t = \pi \) and \( t = 2\pi \) )

2 / Solve the IVP and plot the solution in the interval [ -10, 1.9]

\[ y' = (3t^2 - 1)y^2, \quad y(0) = 6^{-0.5} \]

3 / Solve the IVP and plot the solution in the interval [0, 40]

\[ y'' + 0.1y' + 4y = 0, \quad y(0) = 3, \quad y'(0) = 0 \]

4 / Solve the IVP and plot the solution in the interval [0, 10]

\[ y'' + y' + 0.25y = 0, \quad y(0) = 2, \quad y'(0) = -2 \]