

Assignment 5

- A. Write a MATLAB script `Assignment5A_Groupxx.m`¹ that plots the parametric space curve given by

$$x(t) = 1 + \cos(t), \quad y(t) = \sin(t), \quad z(t) = 2 \sin(t/2), \quad -2\pi \leq t \leq 2\pi$$

as seen from four camera positions:

- (a) $x = 8, y = -14, z = 3$
- (b) $x = 1, y = 0, z = 10$
- (c) $x = 1, y = 10, z = 0$
- (d) $x = 10, y = 0, z = 0$

Put all four plots in a single figure window. Display the camera position in a corner of each plot.

Hint: Use the `cameraposition` property of the `Axes` object to set the camera position. Use the `legend` function to display the camera position. Use the `num2str` function to convert numbers to character vectors.

- B. Write a MATLAB script `Assignment5B_Groupxx.m`² that uses symbolic operations to find the stationary points of the symbolic function

$$f(x, y) = x^4 - x^2 + y^2, \quad x, y \in \mathbb{R}.$$

Use the Hesse matrix of the function to determine the type of the stationary points. Convert the symbolic function to a function handle and compute its values in the rectangle $[-1, 1] \times [-1, 1]$ on a grid of dimension 101×101 . Generate a surface plot and a contour plot for the levels $f(x, y) = -0.25 : 0.05 : 0.25$. Mark the stationary points in the contour plot.

¹xx is your group number