Applied Mathematics Report 1

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Deadline 23:59 on May 24
Submission Solve the following two problems, write the answers in word or pdf format, make a folder of your ID number like `XL15000` in the folder of `kadai1` in the folder of `Submission` in the folder of `Applied Mathematics`, which can be accessed on the computers in this institute, and put the file in the folder you made.
Note Write the date when you made the file, your ID number, and your name in the file. As for the graphs, use some drawing software like gnuplot to make graphs and embed them in the file of the report. Write the process of calculation. You may hand-write the process of calculation and scan it, but even in that case use some drawing software to make graphs. If you submit the report after the deadline, I do not guarantee the point of the report to be included in the total score.

Problem 1 Fit a straight line (a linear function) to the following four points so that (the half of) the sum of the squares of the distances of those points from the straight line is minimum, where the distance is measured in the vertical direction (the y-direction). Write the process of the fitting, and depict the graph with the four points.

$$(-1, 2), (0, 1), (1, -1), (2, -2)$$

Problem 2 Fit a parabola (a square function) to the following four points so that (the half of) the sum of the squares of the distances of those points from the parabola is minimum, where the distance is measured in the vertical direction (the y-direction). Write the process of the fitting, and depict the graph with the four points.

$$(-1, 0), (0, -1), (1, 0), (2, 4)$$