

The background of the slide is a faded image of the Jiaotong University gate. The gate is a large, white, curved structure with the university's name in English, "JIAOTONG UNIVERSITY", on the right side and in Chinese, "交通大学", on the left side. The gate is flanked by trees and a building with a red roof. A large, dark purple rectangular box is superimposed over the center of the image, containing the title "作业5" in yellow text.

作业5

2021-2022学年第2学期

作业5

1. 设:

$$f(\mathbf{x}) = \frac{3}{2}x_1^2 + \frac{1}{2}x_2^2 - x_1x_2 - 2x_1$$

令初始点 $\mathbf{x}^{(1)} = (-2, 4)^T$, 分别用最速下降法和牛顿法求出一步迭代后的 $\mathbf{x}^{(2)}$ 。

2. (教材89页, 习题第3题) 用最速下降法求解问题:

$$\min f(\mathbf{x}) = x_1^2 + 2x_2^2 + 4x_1 + 4x_2$$

设 $\mathbf{x}^{(1)} = (0, 0)^T$, 证明:

$$\mathbf{x}^{(k+1)} = \left(\frac{2}{3^k} - 2, \left(-\frac{1}{3} \right)^k - 1 \right)^T.$$