

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 banner with the text "作业1" is overlaid on the gate.

作业1

2021-2022学年第2学期

作业1

教材习题：

- P36 – 1, 4(2), 7(1)

补充习题：

1. 试证明平面上的椭圆：

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

所包围的区域是凸集。

2. 判断以下函数的凸凹性，并说明理由：

- 函数1：

$$f(x) = \frac{1}{x}, x < 0$$

- 函数2：

$$f(\mathbf{x}) = x_1^2 + 2x_2^2 + x_3^2 + x_1x_2 - 7x_1 - 2x_3 + 12$$