FULL NAME	

ID NUMBER

SIGNATURE

Resit Exam January 28, 2014

Questions

1. [20 points] Consider the following optimization problem:

$$\max_{x \ge 0} \ \pi(x) \equiv qx^{2/3} - 2x$$

Here, q > 0 is a fixed parameter. Explain in detail why $x^* = 0$ is not a solution to this problem.

2. [10 points] Consider the following optimization problem:

$$\min_{y \in \mathbb{R}} f(y) \equiv \alpha - 2y^3$$

Here, $\alpha>0$ is a fixed parameter. Explain in detail why this problem does not have a solution.

3. [20 points] Consider the following system of linear equations:

$$Ax = 0$$

Here, 0 is the null vector and A is a square matrix of order $n \times n$ such that

$$a_{ij} = 0$$
 if $i \neq j$

and

 $a_{ij} = i$ if i = j

where $i, j \in \{1, 2, ..., n\}$ index rows and columns. Explain in detail why this system does not have a nontrivial solution $x^* \neq 0$.