Worksheet #17 (2017/12/18)

Name: ID:

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Note: We will collect this worksheet at the end of the lecture.

- We plan to cover Sections 6.1–6.2.1 (exclusive) today.
- We use Chapter 06 slides 1–9.
- This is corresponding to the textbook pages 256–260.

1) Write two sample optimization problems: one unconstrained and one constrained.

2) What are the linear and nonlinear programming problems?

3) Write down the dual problem of: minimize the cost of diet subject to nutritional constraints.

4) Are the following functions coercive? If yes, what is the minimum for each of them?

   a) $f(x) = x^2$ on $\mathbb{R}$.

   b) $f(x) = x^3$ on $\mathbb{R}$.

   c) $f(x) = e^x$ on $\mathbb{R}$.

   d) $f(x_1, x_2) = x_1^4 - 4x_1x_2 + x_2^4$ on $\mathbb{R}^2$.