

Exercises

- (1) [20 points] Construct an explicit example for each of the following cases:
 - (a) Both of the primal linear program and its dual problem have a non-empty bounded feasible domain.
 - (b) Both of the primal linear program and its dual problem are feasible, but one has a bounded feasible domain while the other has an unbounded feasible domain.
 - (c) Both of the primal linear program and its dual problem are infeasible.
 - (d) One of the primal linear program and its dual problem is feasible while the other is infeasible.
- (2) [10 points] Prove that “if a primal linear program has more than one optimal solutions, then its dual problem must be degenerate.”
- (3) [20 points] Textbook Exercise 4.10.
- (4) [10 points] Textbook Exercise 5.1.
- (5) [15 points] Textbook Exercise 7.1.
- (6) [25 points] Please go to page 147 of our textbook. Prove that the affine scaling transformation T_k indeed has the properties (T1) – (T6) as stated in the textbook.