

Econ 172A, Fall 2012: Quiz 2, Answers

Comment: 5 points for each correct answer. 40 points possible. Median 23. (Students who followed directions and remained seated until the class was over received two bonus points.)

FORM 1 SOLUTION

1. True. (Part of Duality Theorem.)
2. True.
3. True. $x = 0$ satisfies the constraints.
4. True. (D) is not feasible by duality and (D') has the same feasible set as (D) .
5. True. (D) has a solution if and only if (D') has a solution (because the only difference is that the objective functions differ by multiplication by a positive constant). Hence (P) has a solution by Duality.
6. True. If (D') is not feasible, then (D) is not feasible, so (P) cannot have a solution.
7. False. ($A = 0$ but $c > 0$ is possible.)
8. True. (P) has the same objective function and a smaller feasible set.

FORM 2 SOLUTION

1. True. (Part of Duality Theorem.)
2. True.
3. False.
4. True. (P') has a larger feasible set since $\alpha b \geq b$.
5. True. (D) has a solution if and only if (D') has a solution (because the only difference is that the objective functions differ by multiplication by a positive constant). Hence (P) has a solution by Duality.
6. True. If (D') is not feasible, then (D) is not feasible, so (P) cannot have a solution.
7. False. (Like 3.)
8. True. (P) has the same objective function and a smaller feasible set.

FORM 3 SOLUTION

1. True. (Part of Duality Theorem.)
2. False. $y \geq 0$ constraint missing.
3. True. (D') has larger feasible set (because $y \geq 0$ is missing in (D')).
4. False. (P') need not have a larger feasible set (need $b \geq 0$ for statement to be true).
5. True. (D) has a nonempty feasible set by duality and (D') has a bigger feasible set than (D) .
6. True. If (D') is not feasible, then (D) is not feasible, no (P) cannot have a solution.
7. True. (P') has solution implies dual of (P') has a solution. The feasible set of the dual of (P') is the same as the feasible set of (D) .
8. False. (This would be true if $b \geq 0$.)