IMPORTANT

1. **READ CAREFULLY. YOUR FORM FOR THIS QUIZ MAY NOT BE THE SAME AS YOUR FORM FOR QUIZ 1.**

   The quiz has 3 forms. You should answer the questions from only one form.

   - If the second number in your student ID is 1, 4, 7 answer the questions from Form 1.
   - If the second number in your student ID is 2, 5, 8, 0 answer the questions from Form 2.
   - If the second number in your student ID is 3, 6, 9, or if you have no student identification number, answer the questions from Form 3.

2. Please read the question carefully.
3. You may not use calculators, books, or notes during this quiz.
4. If you do not know how to interpret a question, then ask me.
5. Please remain in your seat until the exam is over.
6. You will not receive credit unless you put your answers in the spaces below.
7. I will collect the quizzes at 4:50.

RECORD ANSWERS

- NAME:
- STUDENT IDENTIFICATION NUMBER:

  Circle the appropriate choice (only one correct choice per question).

I read the instructions and my answers correspond to the appropriate form, which is:

FORM . **I** **II** **III**

Question 1. **TRUE** **FALSE**

Question 2. **TRUE** **FALSE**

Question 3. **TRUE** **FALSE**

Question 4. **TRUE** **FALSE**

Question 5. **TRUE** **FALSE**

Question 6. **TRUE** **FALSE**

Question 7. **TRUE** **FALSE**

Question 8. **TRUE** **FALSE**

Form I

This is Form 1. Use this form if the **second** number in your student ID number is 1, 4, 7. Otherwise use another form.

For each of the statements below, circle (on the answer sheet) **TRUE** if the statement is always true, circle **FALSE** otherwise. (P) refers to the problem:

$$\max c \cdot x \text{ subject to } Ax \leq b, x \geq 0$$

and (D) is the dual of (P). Assume $A, b \geq 0$. (P') refers to the problem:

$$\max c \cdot x \text{ subject to } Ax \leq \alpha b, x \geq 0$$

where $1 < \alpha$ and (D') refers to the problem:

$$\min \alpha b \cdot y \text{ subject to } yA \geq c, y \geq 0$$

1. If x^* solves (P') and y^* solves (D'), then $c \cdot x^* = y^* A x^*$.

2. (D') is the dual of (P').

3. (P') is feasible.

4. If (P) is unbounded, then (D') is not feasible.

5. If (D') has a solution, then (P) has a solution.

6. If (D') is not feasible, then (P) has no solution.

7. (D') is feasible.

8. If both (P) and (P') have solutions, then the value of (P) is less than or equal to the value of (P').

Form 2

This is Form 2. Use this form if the **second** number in your student ID number is 2, 5, 8, or 0. Otherwise use another form.

For each of the statements below, circle (on the answer sheet) **TRUE** if the statement is always true, circle **FALSE** otherwise. (P) refers to the problem:

$$\max c \cdot x \text{ subject to } Ax \leq b, x \geq 0$$

and (D) is the dual of (P). Assume $b \geq 0$. (P') refers to the problem:

$$\max c \cdot x \text{ subject to } Ax \leq \alpha b, x \geq 0$$

where $1 < \alpha$ and (D') refers to the problem:

$$\min \alpha b \cdot y \text{ subject to } yA \geq c, y \geq 0$$

1. If x^* solves (P') and y^* solves (D'), then $c \cdot x^* = y^* A x^*$.
2. (D') is the dual of (P').
3. If (D') is feasible, then (P') is feasible.
4. If (P) is feasible, then (P') is feasible.
5. If (D') has a solution, then (P) has a solution.
6. If (D') is not feasible, then (P) has no solution.
7. If (P') is feasible, then (D') is feasible.
8. If both (P) and (P') have solutions, then the value of (P) is less than or equal to the value of (P').

Form 3

This is Form 3. Use this form if the **second** number in your student ID number is 3, 6, 9, or if you have no student ID. Otherwise use another form.

For each of the statements below, circle (on the answer sheet) **TRUE** if the statement is always true, circle **FALSE** otherwise. (P) refers to the problem:

$$\max c \cdot x \text{ subject to } Ax \leq b, x \geq 0$$

and (D) is the dual of (P).

(P') refers to the problem:

$$\max c \cdot x \text{ subject to } Ax \leq \alpha b, x \geq 0$$

where $1 < \alpha$ and (D') refers to the problem:

$$\min \alpha b \cdot y \text{ subject to } yA \geq c$$

1. If x^* solves (P) and y^* solves (D), then $c \cdot x^* = y^* A x^*$.

2. (D') is the dual of (P').

3. If (D) is feasible, then (D') is feasible.

4. If (P) is feasible, then (P') is feasible.

5. If (P) has a solution, then (D') is feasible.

6. If (D') is not feasible, then (P) has no solution.

7. If (P') has a solution, then (D) is feasible.

8. If both (P) and (P') have solutions, then the value of (P) is less than or equal to the value of (P').