



Preview Test: Mid Term Exam

Instructions

Name Mid Term Exam

Instructions

Multiple Attempts This Test allows multiple attempts.

Force Completion This Test can be saved and resumed later.

Save All Answers

Close Window

Save and Submit

Question 1

2 points

Save Answer

A dual problem has no constraints on two non-negative variables, w_1 and w_2 . The objective of the dual problem is to maximize the function:

$$z' = 2w_1 - 3w_2$$

What is an optimal solution of the primal (minimization) problem?

- Empty solution (infeasible region)
- Alternative optimal solution with the value $z = 0$ and two arbitrary decision variables x_1 and x_2
- Unbounded objective function
- Unique optimal solution with the value $z = 0$

Question 2

2 points (Extra Credit)

Save Answer

Prove that the intersection of two convex sets is convex.

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Normal 3 Arial | **B** *I* U abc | x_1 x^2 | [List Icons] [Link Icon] [Image Icon]

Path: body

Question 3

2 points

Save Answer

SUMPRODUCT command of excel can be used for multiplying elements of two arrays of unequal lengths, though it is usually used for arrays of equal length.

- True
- False

2 points

Save Answer

Question 4

Given the transportation problem

a

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Test/Survey Status

	29	28	36	40
b	39	3	18	

One of the terms in the objective function will be ____x₂₁

Question 5

2 points [Save Answer](#)

All linear programming problems with only two variables may be solved using graphical method.

- True
 False

Question 6

2 points [Save Answer](#)

The problem is to maximize the function:

$$z = 2x_1 - 3x_2$$

subject to the constraints:

$$\begin{aligned} x_1 + x_2 &= 4 \\ x_1 + x_3 &= 3 \\ x_1 &\geq 0, x_2 \geq 0, x_3 \geq 0 \end{aligned}$$

The final simplex tableau is

	x ₁	x ₂	x ₃	
x ₂	0	1	-1	1
x ₁	1	0	1	3
z	0	0	5	3

Find values of the dual variables w₁ and w₂ associated with the first and second constraints, respectively.

- w₁ = 0 and w₂ = -5
 w₁ = 0 and w₂ = 0
 w₁ = -3 and w₂ = -5
 w₁ = 3 and w₂ = -5

Question 7

2 points [Save Answer](#)

All Transprtation basic matrices are _____ triangular matrices.

Question 8

In using **Solver** package for solving a **linear** programming problem, circle the option that should be ticked.

2 points [Save Answer](#)

Solver Options ✕

Max Time: seconds OK

Iterations: Cancel

Precision: Load Model...

Tolerance: % Save Model...

Convergence: Help

Assume Linear Model Use Automatic Scaling

Assume Non-Negative Show Iteration Results

Estimates	Derivatives	Search
<input checked="" type="radio"/> Tangent	<input checked="" type="radio"/> Forward	<input checked="" type="radio"/> Newton
<input type="radio"/> Quadratic	<input type="radio"/> Central	<input type="radio"/> Conjugate

Selected Coordinates

Question 9

2 points

Click on the correct answer

Identify the type of the feasible region given by the set of inequalities

$$\begin{aligned} x - y &\leq 1 \\ x - y &\geq 2 \end{aligned}$$

where both x and y are positive.

A triangle

An unbounded region

A rectangle

An empty region

Selected Coordinates

Question 10

2 points

Save Answer

Given the transportation problem

a

23	18	9	31
18	31	34	12
27	14	2	

b

The element a_{34} of the corresponding transportation matrix is

Question 11

2 points

Save Answer

Given the transportation problem

a

5	10	36	20
29	28	36	40
39	3	18	

b

One of the terms in the objective function will be $\text{---} \times x_{12}$

Question 12

2 points

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Save Answer

البرنامج الخطي

خوارزمية بلاند

المصفوفة الأحادية كليا

- Define
- Convex set
- Linear program
- Bland's rule
- A totally unimodular matrix

Visual Editor: ON

Normal 3 Arial **B** *I* U x_2 x^2

Path: body

Question 13

2 points

Save Answer

In using **Solver** package for solving a **linear** programming problem. Non negativity conditions should not be included in the constraints set as they can be dealt with in the options of the Solver. Click on the option that should be ticked to include the non negativity conditions.

Solver Options

Max Time: 100 seconds

Iterations: 100

Precision: 0.000001

Tolerance: 5 %

Convergence: 0.0001

Assume Linear Model

Assume Non-Negative

Use Automatic Scaling

Show Iteration Results

Estimates: Tangent, Quadratic

Derivatives: Forward, Central

Search: Newton, Conjugate

Selected Coordinates

Clear

Question 14

2 points

Save Answer

Click on the correct answer

XYZ Inc. produces two types of paper towels, called regular and super-soaker. Marketing has imposed a constraint that the total monthly production of regular should be no more than twice the monthly production of super-soakers. Letting X_1 be the number of units of regular produced per month and X_2 represent the number of units of super-soaker produced per month, the appropriate constraint/s will be

A) $X_1 \leq 2X_2$.	B) $2X_1 \leq X_2$.
C) $X_1 \leq 0.5X_2$.	D) $X_1 - X_2 \leq 0$.
E) $X_1 - 0.5X_2 \geq 0$	

Selected Coordinates

Clear

2 points

Save Answer

Question 15

- True
- False

Question 16

2 points [Save Answer](#)

Which statement describes the Weak Duality Theorem?

- If a primal problem has finite optimal solution, the dual problem has also a finite optimal solution
- Objective function of the minimization problem may not be smaller than that of the maximization problem
- Objective function of the minimization problem may not be greater than that of the maximization problem
- Finite optimal solutions of the primal and dual problems have the same value of objective functions

Question 17

2 points [Save Answer](#)

The problem is to find maximum of the function

$$z = 3x_1 + 4x_2$$

subject to the constraints:

$$\begin{aligned} x_1 - x_2 &\geq 4 \\ x_1 &\leq 0, x_2 \geq 0 \end{aligned}$$

Suppose the dual variable w_1 is associated to the first constraint. Find the feasible region of the dual problem.

- $w_1 \geq 3$
- $3 \leq w_1 \leq 4$
- $w_1 \leq 0$
- $w_1 \geq 0$

Question 18

2 points [Save Answer](#)

Given the transportation problem

		a			
		5	10	36	20
		29	28	36	40
b		39	3	18	

One of the constraints will be

$$x_{12} + x_{22} = \underline{\hspace{2cm}}$$

Question 19

2 points [Save Answer](#)

In using Solver package for solving a linear programming problem, the **decision** variables are assigned to ____ cells.

- constraint
- target
- changing
- variable

Save and Submit