

Name: _____

Instructions: All solutions should be prepared carefully and neatly. All solution sets shall be completed on this packet and submitted by uploading a scan or picture of your written work to D2L by 11:59 PM on the due date below. **Submit only a single pdf file of your entire packet. Submit any Excel or Python files as well.** The mobile app called *Genius Scan* works well. Use a PENCIL and if you make a mistake, use an eraser. Careless presentation (e.g. bad handwriting, pen scribbles, doodles, wasted space, etc) will result in a deduction of points at my discretion. Submitted work that does not demonstrate clearly the process by which one arrived at the answer will not receive credit of any kind. Academic dishonesty will not be tolerated.

PROBLEM SET IV

MAT 362-010 – OPERATIONS RESEARCH II

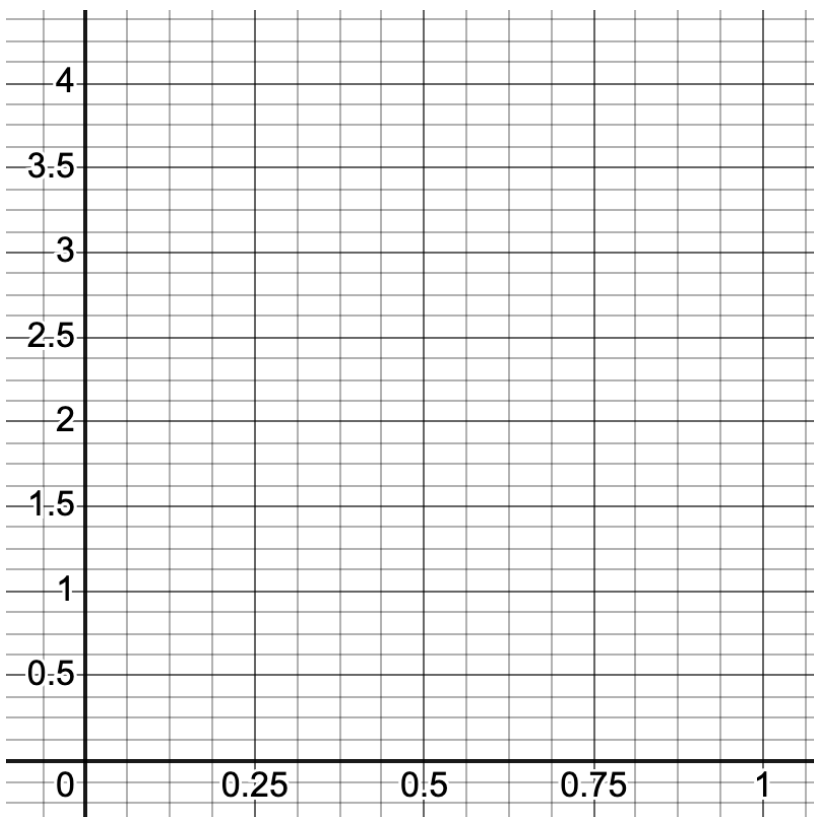
DUE: FRIDAY, APRIL 19 BY 11:59 PM ON D2L

READ: SECTIONS 14.1–14.3

Problem Number	Available Points	Your Points
1	8	
2	4	
3	8	
Total	20	

1. Graphically solve the following zero-sum game. The reward matrix is in terms of Player A . Once you found one player's strategy determine the strategy of the other player. [(8)]

	B_1	B_2
A_1	4	0
A_2	3	1
A_3	1	2



2. Two companies promote two competing products. Currently, each product controls 50% of the market. Because of recent improvements in the two products, each company plans to launch an advertising campaign. If neither company advertises, equal market shares will continue. If either company launches a stronger campaign, the other company is certain to lose a proportional percentage of its customers. A survey of the market shows that 50% of potential customers can be reached through television, 30% through newspapers, and 20% through radio. [(4)]
- (a) Formulate the problem as a two-person zero-sum game, and determine the advertising media for each company.
- (b) Determine a range for the value of the game. Can each company operate with a single pure strategy?

3. Consider the following reward matrix for Player A for a zero-sum game. Formulate an LP for both players and solve both of them in Excel. Include your formulations and the solutions in the space below. Who wins the game?

[(8)]

	B_1	B_2	B_3	B_4	B_5
A_1	1	-3	2	-2	1
A_2	2	3	0	3	-2
A_3	0	4	-1	-3	2
A_4	-4	0	-2	2	-1