Math 414 Hw 29 Name _____Score____/12

1(5) The supply vector is ⟨10, 40, 30⟩, The demand vector is ⟨20, 20, 30, 10⟩ and the shipping costs (objective coefficients) are

5 3 5 6
6 2 2 5
3 6 9 2

Enter the supply vector in the rightmost border.
Enter the demand vector in the bottom border.
Enter the objective coefficients in the upper left corner of each interior square.
Use the greedy algorithm to mark parameter squares with zeros and, in basic squares, to mark and [circle] the basic variable values.
This will be the initial transportation matrix.

	P_1	P_2	P_3	P_4	Supply
S_1					10
S_2		2 [20]			
S_3		6 0			
Demand	20				

For this initial matrix, shipping cost (objective value) is

2(7) The supply vector is ⟨120 140 100⟩, the demand vector is ⟨100 60 80 120⟩ and the shipping costs (objective coefficients) are

5 7 9 6
6 7 10 5
7 6 8 1

Then the initial transportation matrix is.

					Supply
	5 [100]	7 [20]	9 0	6 0	120 ... 0
	6 0	7 [40]	10 [80]	5 [20]	140 ... 0
	7 0	6 0	8 0	1 [100]	100 ... 0
Demand	100 ... 0	60 ... 0	80 ... 0	120 ... 0	

Now fill in the first transportation tableau as follows:

- First copy the shipping cost coefficients to the upper left corners of their squares as in the initial matrix.
- The 6 x_{ij}'s with circled values in the initial matrix are the basic variables. Copy their values from the initial matrix to their squares in the initial transportation tableau below and circle them.
- Use the facts below to write the values of the supply dual variables p_1, p_2, p_3 in the supply column and the values $w_1, ..., w_4$ of the demand dual variables in the demand row.

- For a basic variable, the objective row entry $o_{ij}=0$.
  Thus $c_{ij}-p_i-w_j=0$.
  Thus we have 6 equations: $p_i+w_j=c_{ij}$.
- There are 7 dual variables but only 6 equations: arbitrarily set one, pick p_1 to 0. Thus write 0 in the top right square. For consistency, always choose p_1 to be 0.
- Use the 6 equations $p_i+w_j=c_{ij}$ to solve for the remaining dual variables $p_2, p_3, w_1, ..., w_4$.
- Write their values in their supply column or demand row squares.

For example, $p_1+w_1=c_{11}$. $\therefore$ $0+w_1=5$, $\therefore$ $w_1=5$

- For parameters squares, $o_{ij}=c_{ij}-p_i-w_j$.
  Use these equations to solve for the o_{ij}'s.
  Write o_{ij}'s in the parameter squares.

Note we don't write the 0 we used in the initial matrix. Uncircled squares are parameter squares and x_{ij} a parameter implies $x_{ij}=0$.

- To choose the next entering basic variable, pick the parameter x_{ij} with the most negative o_{ij}. Shade or put an outline around its square.

	P_1	P_2	P_3	P_4	p_i
S_1	5 [100]				0
S_2					
S_3					
w_j	5				