§7.1 (part 2): Formulating Transportation Problems

1.] Three refineries with daily capacities of 6, 5, and 8 million gallons, respectively, supply three distribution areas with daily demands of 4, 8, and 7 million gallons, respectively. Gasoline is transported to the three distribution areas through a network of pipelines. The transportation cost is 10¢ per 1000 gallons per pipeline mile. The table below provides the mileage between the refineries and the distribution areas. Refinery 1 is not connected to distribution area 3. Formulate and solve the transportation LP that will minimize cost.

Mileage Chart

	Distribution Areas		
	1	2	3
Refinery 1	120	180	-
Refinery 2	300	100	80
Refinery 3	200	250	120

2.] Suppose in the previous problem that the capacity of refinery 3 is only 6 million gallons and that distribution area 1 must have its demand met. Additionally, any shortages at areas 2 and 3 will incur a penalty of 5¢ per gallon. Formulate and solve the transportation LP that will minimize cost.