

TOPIC 12: FACILITY LAYOUT AND LOCATION

Practice Problems

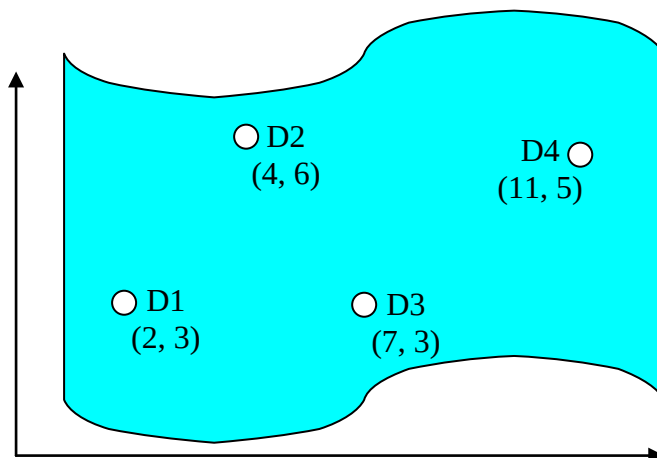
1. The items listed below are stored in a one-dock warehouse. Find the best warehouse layout to minimize average traveling distance.

<u>Item</u>	<u>Trips</u>	<u>Area Needed (blocks)</u>
A	60	10
B	72	4
C	300	5
D	240	3
E	77	1

2. John operates a one-dock warehouse in downtown Spokane. The warehouse receives items at the dock and moves them to a storage area. Later, the workers withdraw inventory to fulfill customer orders. For example, the following table shows that 50 trips per week are made between the dock and storage area for PS2 system package. Find the best warehouse layout so the average traveling distance is minimized.

<u>System Package</u>	<u>Trips</u>	<u>Area Needed (blocks)</u>
PS2	50	10
Game Cube	22	8
X-box	40	12
Gameboy Color	21	3
Gameboy Advance	58	5

3. A toy manufacturer produces toys at four locations in Mexico. Raw materials (primarily barrels of powdered plastic) will be shipped from a new, centralized warehouse whose location is to be determined. The weekly quantities to be shipped to each location are the same. A coordinate system has been established as shown in the following figure. Determine the coordinates of the centralized warehouse.



4. A furniture manufacturer sells furniture in five locations throughout the country. Relative locations have been determined, as shown in the table below. The location of a central manufacturing point for furniture must now be determined. Monthly quantities to be shipped are shown below. Determine the coordinates of the location that will minimize transportation costs.

Location	(x, y)	Monthly Quantity
A	(5, 7)	100
B	(10, 10)	50
C	(6, 8)	75
D	(1, 9)	10
E	(4, 8)	30

5. A manufacturer of automobile carburetors is considering the following three locations for a new plant.

Location	(x, y)
A	(30, 20)
B	(15, 30)
C	(50, 25)

The plant will ship 100 units per day to a customer at coordinates (10, 30), 500 units to a second customer at (50, 10), and 200 per day to a third customer at (20, 20). Calculate the load-distance score for each of the three potential locations, assuming that the mode of transportation is by car over roads that primarily go North-South and East-West. Which location should be chosen?

6. Consider the data in Problem 5. If the mode of transportation is by airplane, which location should be chosen?