❌ Concept Question 1.3

What is the major difference in focus between a location decision in the service sector vs. the manufacturing sector?

❌ A. The focus in manufacturing is on revenue maximization, while the focus in service is on cost minimization.
⭐ B. The focus in service is on revenue maximization, while the focus in manufacturing is on cost minimization.
○ C. There is no difference in focus.
○ D. The focus in manufacturing is on labor, while the focus in service is on raw materials.

✅ Concept Question 1.4

Which of the following statements is NOT true regarding location decisions?

○ A. Location decisions are important because location has a major impact on the overall risk and profit of the company.
○ B. Location decisions to support a low-cost strategy require particularly careful consideration.
✔ C. Once management is committed to a specific location, many costs become relatively easy to reduce.
○ D. Location often has the power to make or break a company's business strategy.

✅ Concept Question 2.2

Which of the following is NOT a key success factor in the country location decision?

○ A. government rules
○ B. labor productivity
✔ C. zoning restrictions
○ D. location of markets

✅ Concept Question 2.3

What term refers to the location of competing companies near each other?

○ A. neighboring
○ B. battling
○ C. centralizing
✔ D. clustering

✅ Concept Question 2.4

Which of the following is NOT an example of tangible costs?

○ A. labor
✔ B. public transportation facilities
○ C. utilities
○ D. depreciation

✓ Concept Question 3.3

Which of the following methods is a mathematical technique used for finding the best location for a single distribution point that services several stores or areas?

- ○ A. factor-rating method
- ○ B. transportation model
- ○ C. locational cost-volume analysis
- ● D. center-of-gravity method

✓ Concept Question 3.4

The transportation model

- ○ A. uses both qualitative and quantitative factors.
- ○ B. finds the location of a single distribution center that minimizes distribution costs.
- ○ C. determines the crossover point between two different locations.
- ● D. determines the best pattern of shipments from several points of supply to several points of demand.

✓ Concept Question 4.3

Which of the following techniques might a service or retail organization use to make a location decision?

- ○ A. crossover charts
- ● B. traffic counts
- ○ C. locational cost-volume analysis
- ○ D. transportation method

✓ Concept Question 4.2

Question Help

Which of the following is NOT identified in the text as one of the eight major determinants of volume and revenue for the service firm?

- ○ A. competition in the area
- ○ B. quality of management
- ● C. level of advertising expenditures
- ○ D. operating policies of the firm

✓ Concept Question 4.4

A goods-producing location decision would likely emphasize the importance of which of the following?

- ○ A. security and lighting
- ○ B. parking and access
- ◉ C. utility and labor costs
- ○ D. appearance and image

✓ Concept Question 5.1

What is a system that stores and displays information that can be linked to a geographic location?

- ○ A. RFID
- ◉ B. GIS
- ○ C. CIM
- ○ D. ASRS

✓ Concept Question 5.2

Which of the following is NOT one of the five elements for each city that geographic information systems use to analyze location decision factors?

- ○ A. cultural and entertainment centers
- ○ B. transportation options
- ◉ C. rivers, mountains, lakes, and forests
- ○ D. residential areas

✖ Problem 8.1

In Myanmar, five laborers, each making the equivalent of $3.00 per day, can produce 38 units per day. In China, eleven laborers, each making the equivalent of $1.75 per day, can produce 48 units. In Billings, Montana, four laborers, each making $57.00 per day, can make 102 units.

Based on labor cost per unit only, the most economical location to produce the item is Myanmar , with a labor cost per unit of $ 0.39 . (Enter your response rounded to two decimal places.)

	Myanmar	China	Montana
laborers	5	11	4
cost	3.00	1.75	57.00
units per day	38	48	102
	0.39	0.40	2.24
Myanmar	(3*5)/38=0.39		
China	(11*1.75)/48=0.40		
Montana	(4*57)/102=0.40		

✔ Problem 8.16

The fixed and variable costs for three potential manufacturing plant sites for a rattan chair weaver are shown:

Site	Fixed Cost Per Year	Variable Cost per Unit
1	$700	$10.00
2	$1,100	$6.00
3	$2,100	$4.00

a) After rounding to the nearest whole number, site 1 is best below 100 units.

After rounding to the nearest whole number, site 2 is best between 100 and 500 units.

After rounding to the nearest whole number, site 3 is best above 500 units.

b) If the demand is 510 units, then the best location for the potential manufacturing plant is SITE 3 .

site	fixed cost	variable cost	
1	700	10.00	700+10x=1100+6x==>x=100
2	1100	6.00	700+10x=2100+4x==>x=233.33
3	2100	4.00	1100+6x=2100+4x==>x=500

⊗ Problem 8.17

Peter Billington Stereo, Inc., supplies car radios to auto manufacturers and is going to open a new plant. The company is undecided between Detroit and Dallas as the site. The fixed costs in Dallas are lower due to cheaper land costs, but the variable costs in Dallas are higher because shipping distances would increase.

	Dallas	Detroit
Fixed costs	$600,000	$800,000
Variable costs	$28/radio	$24/radio

a) Based on the analysis of the volume, after rounding the numbers to the nearest whole number, Dallas is best below and Detroit is best above 50,000 radios.

b) Dallas's fixed costs have increased by 10%. Based on the analysis of the volume, after rounding the numbers to the nearest whole number, Dallas is best below and Detroit is best above 35,000 radios.

	Dallas	Detroit		
Fixed cost	600,000	800,000		
Variable cost	$28/radio	$24/radio		
Dallas	600,000+28x=800,000+24x==>x=**50,000**			
Detroit	660,000+28x=800,000+24x==>x=**35,000**			

⊗ Problem 8.2

In Myanmar, seven laborers, each making the equivalent of $3.00 per day, can produce 40 units per day. In China, ten laborers, each making the equivalent of $2.00 per day, can produce 45 units. In Billings, Montana, two laborers, each making $57.00 per day, can make 100 units.

Shipping cost from Myanmar to Denver, Colorado, the final destination, is $1.50 per unit. Shipping cost from China to Denver is $1.25 per unit, while the shipping cost from Billings, Montana to Denver is $0.30 per unit.

Based on total costs (labor and transportation) per unit, the most economical location to produce the item is Billings, Montana , with a total cost (labor and transportation) per unit of $ 1.44 . (Enter your response rounded to two decimal places.)

	Myanmar	China	Montana	
laborers	7	10	2	
cost per day	3.00	2.00	57.00	
units per day	40	45	100	
shipping per unit	1.5	1.25	0.30	
Myanmar	2.03 ((7*3)+(40*1.5))/40=**2.03**			
China	1.69 ((10*2)+(45*1.25))/45=**1.69**			
Montana	1.44 ((2*57)+(100*0.3))/100=**1.44**			

⊗ Problem 8.20

The following table gives the map coordinates and the shipping loads for a set of cities that we wish to connect through a central hub.

City	Map Coordinates (x,y)	Shipping Load
A	(5,12)	6
B	(6,8)	10
C	(5,7)	14
D	(8,6)	5
E	(6,8)	14
F	(2,2)	10
G	(1,5)	6

a) For the location of the proposed new central hub, the coordinates should be near:

x = 4.77 *(round your response to two decimal places).*

y = 6.80 *(round your response to two decimal places).*

b) If the shipments from city A double, for the location of the proposed new central hub, the coordinates should be near:

x = 4.79 *(round your response to two decimal places).*

y = 7.24 *(round your response to two decimal places).*

City	shipping load	x	y
A	6	5	12
B	10	6	8
C	14	5	7
D	5	8	6
E	14	6	8
F	10	2	2
G	6	1	5

x=	4.77	((6*5)+(10*6)+(14*5)+(5*8)+(14*6)+(10*2)+(6*1))/(6+10+14+5+14+10+6)=4.77
y=	6.80	((6*12)+(10*8)+(14*7)+(5*6)+(14*8)+(10*2)+(6*5))/(6+10+14+5+14+10+6)=6.80

City	shipping load	x	y
A	12	5	12
B	10	6	8
C	14	5	7
D	5	8	6
E	14	6	8
F	10	2	2
G	6	1	5

x=	4.79	((12*5)+(10*6)+(14*5)+(5*8)+(14*6)+(10*2)+(6*1))/(12+10+14+5+14+10+6)=4.79
y=	7.24	((12*12)+(10*8)+(14*7)+(5*6)+(14*8)+(10*2)+(6*5))/(12+10+14+5+14+10+6)=7.24

Todd's Direct, a major TV sales chain headquartered in New Orleans, is about to open its first outlet in Mobile, Alabama, and wants to select a site that will place the new outlet in the center of Mobile's population base. Todd examines the seven census tracts in Mobile, plots the coordinates of the center of each from a map, and looks up the population base in each to use as a weighting. The information gathered appears in the following table.

Census Tract	Population in Census Tract	X, Y Map Coordinates
101	1,800	(25,45)
102	5,000	(26,25)
103	10,000	(57,48)
104	6,800	(50,22)
105	10,200	(80,52)
106	21,000	(68,18)
107	14,000	(96,25)

a) The center-of-gravity coordinates for the location of the proposed outlet in Mobile, Alabama should be:

x = 67.92 (round your response to two decimal places).

y = 30.44 (round your response to two decimal places).

b) Census tracts 103 and 105 are each projected to grow by 20% in the next year. The new center-of-gravity coordinates for the location of the proposed outlet in Mobile, Alabama should be:

x = 67.96 (round your response to two decimal places).

y = 31.52 (round your response to two decimal places).

Census Tract	pop. In census tract	x	y					
101	1,800	25	45					
102	5,000	26	25					
103	10,000	57	48					
104	6,800	50	22					
105	10,200	80	52					
106	21,000	68	18					
107	14,000	96	25					
x=		67.92	((1800*25)+(5000*26)+(10000*57)+(6800*50)+(10200*80)+(21000*68)+(14000*96))/(1800+5000+10000+6800+10200+21000+14000)=**67.92**					
y=		30.44	((1800*45)+(5000*25)+(10000*48)+(6800*22)+(10200*52)+(21000*18)+(14000*25))/(1800+5000+10000+6800+10200+21000+14000)=**30.44**					

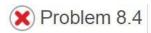| Census Tract	pop. In census tract	x	y					
101	1,800	25	45					
102	5,000	26	25					
103	12,000	57	48					
104	6,800	50	22					
105	12,240	80	52					
106	21,000	68	18					
107	14,000	96	25					
x=		67.96	((1800*25)+(5000*26)+(12000*57)+(6800*50)+(12240*80)+(21000*68)+(14000*96))/(1800+5000+12000+6800+12240+21000+14000)=**67.96**					
y=		31.52	((1800*45)+(5000*25)+(12000*48)+(6800*22)+(12240*52)+(21000*18)+(14000*25))/(1800+5000+12000+6800+12240+21000+14000)=**31.52**					

You have been asked to analyze the bids for 200 polished disks used in solar panels. These bids have been submitted by three suppliers: Thailand Polishing, India Shine, and Sacramento Glow. Thailand Polishing has submitted a bid of 2,000 baht. India Shine has submitted a bid of 2,000 rupee. Sacramento Glow has submitted a bid of $200. You check with your local bank and find that $1 = 10 baht and $1 = 8 rupee.

The price per unit for Thailand Polishing = $ 1.00 . *(Enter your response rounded to the nearest penny.)*

The price per unit for India Shine = $ 1.25 . *(Enter your response rounded to the nearest penny.)*

The price per unit for Sacramento Glow = $ 1.00 . *(Enter your response rounded to the nearest penny.)*

	Thailand Polishing	India Shine	Sacramento Glow
Bid	2,000 baht	2,000 rupee	$200
exchange rate	$1=10	$1=8	$1=$1
Bids for 200 disks	1.00	1.25	1.00
Thailand Polishing	(2000/10)/200=1.00		
India Shine	(2000/8)/200=1.25		
Sacramento Glow	(200/1)/200=1.00		

❌ Problem 8.4

You have been asked to analyze the bids for 200 polished disks used in solar panels. These bids have been submitted by three suppliers: Thailand Polishing, India Shine, and Sacramento Glow. Thailand Polishing has submitted a bid of 3,000 ba India Shine has submitted a bid of 3,000 rupee. Sacramento Glow has submitted a bid of $300. You check with your local bank and find that $1 = 10 baht and $1 = 8 rupee. The final destination for the disks is New Delhi, India and there is a 35% import tax. Thailand Polishing and Sacramento Glow are based outside of India and India Shine is based in India.

The price per unit (in dollars), including import tax (if any) for Thailand Polishing = $ 2.03 . *(Enter your response rounded to the nearest penny.)*

The price per unit (in dollars), including import tax (if any) for India Shine = $ 1.88 . *(Enter your response rounded to the nearest penny.)*

The price per unit (in dollars), including import tax (if any) for Sacramento Glow = $ 2.03 . *(Enter your response rounded to the nearest penny.)*

	Thailand Polishing	India Shine	Sacramento Glow
Bid	3,000 baht	3,000 rupee	$300
exchange rate	$1=10	$1=8	$1=$1
import tax 35%			
Bids for 200 disks	1.50	1.88	1.50
Thailand Polishing	(2000/10)/200=1.50	2.03	1.5*1.35=1.35
India Shine	(3000/8)/300=1.88	1.88 since already in india	
Sacramento Glow	(300/1)/200=1.50	2.03	1.5*1.35=2.03

✓ Problem 8.5

Subway, with more than 20,000 outlets in the U.S., is planning for a new restaurant in Buffalo, New York. Three locations are being considered. The following table gives the factors for each site.

Factor	Weight	Maitland	Baptist Church	Northside Mall
Space	0.35	55	70	75
Costs	0.25	45	80	30
Traffic density	0.20	50	80	60
Neighborhood income	0.15	45	75	40
Zoning laws	0.05	80	15	95

a) Based on the given information, the best location in Buffalo for Subway to open the new restaurant is Baptist Church ,
with a total weighted score of 72.5 . *(Enter your response rounded to two decimal places.)*

b) If the weights for Space and Traffic density are reversed, the best location in Buffalo for Subway to open the new
restaurant will be Baptist Church , with a total weighted score of 74.00 . *(Enter your response rounded to two decimal
places.)*

factor	weight	maitland	baptist church	northside mall
space	0.35	55	70	75
costs	0.25	45	80	30
traffic density	0.20	50	80	60
neighborhood income	0.15	45	75	40
zoning laws	0.05	80	15	95
TOTAL		19.25	24.5	26.25
		11.25	20	7.5
		10	16	12
		6.75	11.25	6
		4	0.75	4.75
	SUM	**51.25**	**72.5**	**56.5**
factor	weight	maitland	baptist church	northside mall
space	0.20	55	70	75
costs	0.25	45	80	30
traffic density	0.35	50	80	60
neighborhood income	0.15	45	75	40
zoning laws	0.05	80	15	95
TOTAL		11	14	15
		11.25	20	7.5
		17.5	28	21
		6.75	11.25	6
		4	0.75	4.75
	SUM	**50.50**	**74.00**	**54.25**

✓x Problem 8.6

Ken Gilbert owns the Knoxville Warriors, a minor league baseball team in Tennessee. He wishes to move the Warriors south, to either Mobile (Alabama) or Jackson (Mississippi). The table below gives the factors that Ken thinks are important, their weights, and the scores for Mobile and Jackson.

Factor	Weight	Mobile	Jackson
Incentive	0.40	75	55
Player satisfaction	0.30	15	50
Sports interest	0.20	40	85
Size of city	0.10	70	25

a) Based on the given information, the best location for the Warriors to relocate to is Jackson , with a total weighted score of 56.50 . *(Enter your response rounded to two decimal places.)*

b) Jackson just raised its incentive package, and the new score is 75. Why doesn't this impact your decision in part (a)?

- ✗ A. Even if the score is 75, Jackson will stay as the second choice.
- ○ B. Even if the score is 75, Jackson's total weighted score drops to 55, just ahead of Mobile.
- ★ C. Because Jackson is already the better site.

Factor	Weight	Mobile	Jackson	
incentive	0.40	75	55	
player satisfaction	0.30	15	50	
sports interest	0.20	40	85	
size of city	0.10	70	25	
Mobile		49.50	(0.4*75)+(0.3*15)+(0.2*40)+(0.1*70)=49.50	
Jackson		56.50	(0.4*55)+(0.3*50)+(0.2*85)+(0.1*25)=56.50	

Marilyn Helm Retailers is attempting to decide on a location for a new retail outlet. At the moment, the firm has three alternatives: stay where it is but enlarge the facility; locate along the main street in nearby Newbury; or locate in a new shopping mall in Hyde Park. The company has selected the four factors listed in the following table as the basis for evaluation and has assigned weights as shown:

Factor	Factor Description	Weight	Present Location	Newbury	Hyde Park
1	Average community income	0.30	45	65	55
2	Community growth potential	0.15	15	20	80
3	Availability of public transportation	0.20	30	65	55
4	Labor availability, attitude, and cost	0.35	80	55	45

a) Based on the given information, the best location for Marilyn Helm Retailers is to open the new retail outlet in Hyde Park , with a total weighted score of 55.25 . *(Enter your response rounded to two decimal places.)*

b) A new subway station is scheduled to open across the street from the present location in about a month, so its third factor score should be raised to 40.

Then, the best location for Marilyn Helm Retailers is to open the new retail outlet in Hyde Park , with a total weighted score of 55.25 . *(Enter your response rounded to two decimal places.)*

Factor Description	Weight	Present Location	Newbury	Hyde Park
Average community income	0.3	45	65	55
Community growth potential	0.15	15	20	80
Availability of public transportation	0.2	30	65	55
Labor availability, attitude, and cost	0.35	80	55	45
	TOTAL	13.5	19.5	16.5
		2.25	3	12
		6	13	11
		28	19.25	15.75
	SUM	**49.75**	**54.75**	**55.25**

Factor Description	Weight	Present Location	Newbury	Hyde Park
Average community income	0.3	45	65	55
Community growth potential	0.15	15	20	80
Availability of public transportation	0.2	40	65	55
Labor availability, attitude, and cost	0.35	80	55	45
	TOTAL	13.5	19.5	16.5
		2.25	3	12
		8	13	11
		28	19.25	15.75
	SUM	**51.75**	**54.75**	**55.25**