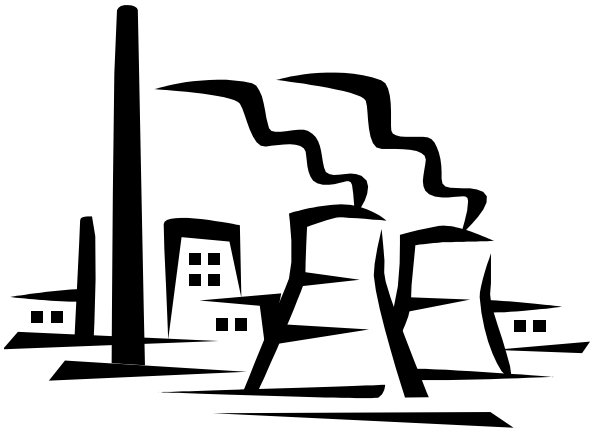
Location Options

- Expand existing facility
- Add new location and retain the existing one
- Close down existing facility -- and move to a new location
- Do nothing

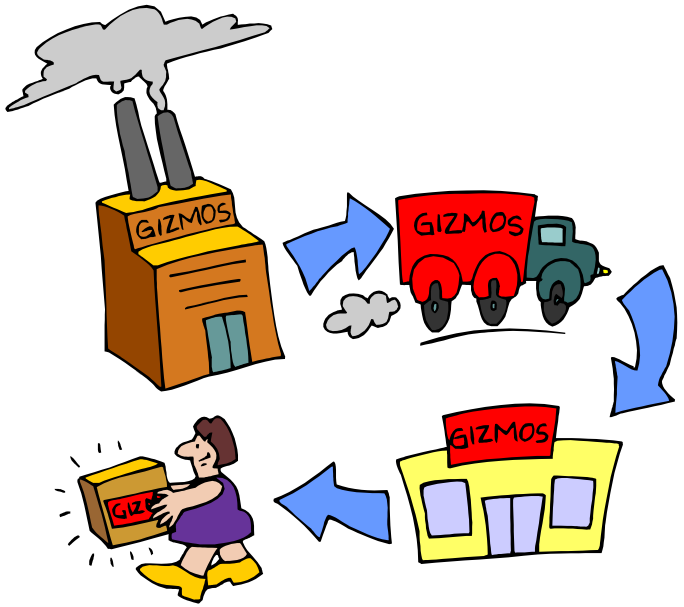


Location Process

- Determine criteria
- Identify critical factors
- Develop location alternatives
- Evaluate alternatives and make the decision

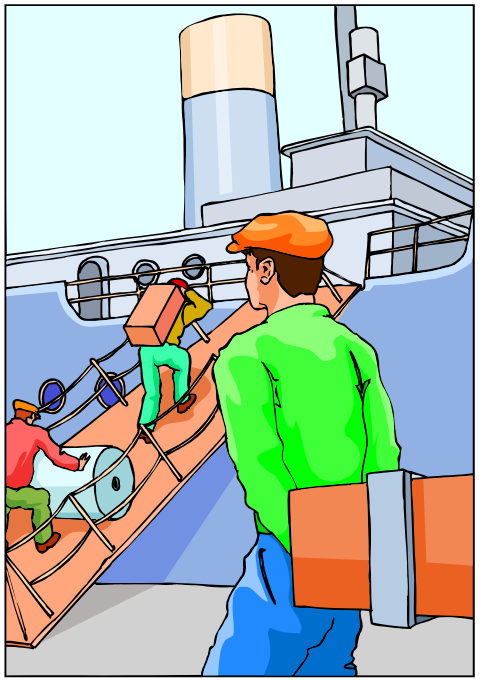
Regional Factors

- raw materials (manufacturing)
  - customers (service)
- markets either final products or customers
- resources



Labor Factors

- Cost
- Availability
- Productivity
- Union Strength



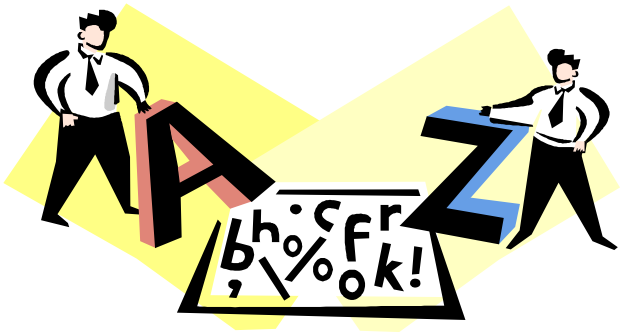
Robert Kaplan

- **Author of**
- **Relevance Lost:**

  The Rise and Fall of Management Accounting

Components of Cost

- 1920-1930
- Raw Material 45-50%
- Direct Labor 45-50%
- Overhead <10%

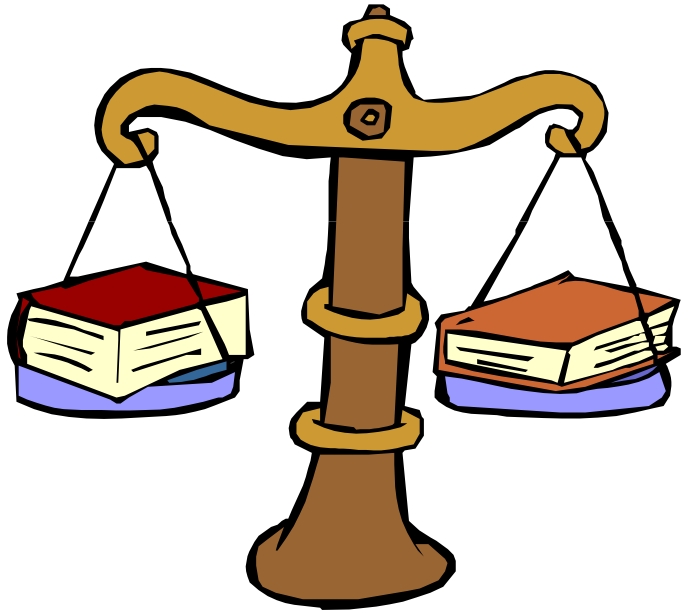


Components of Cost

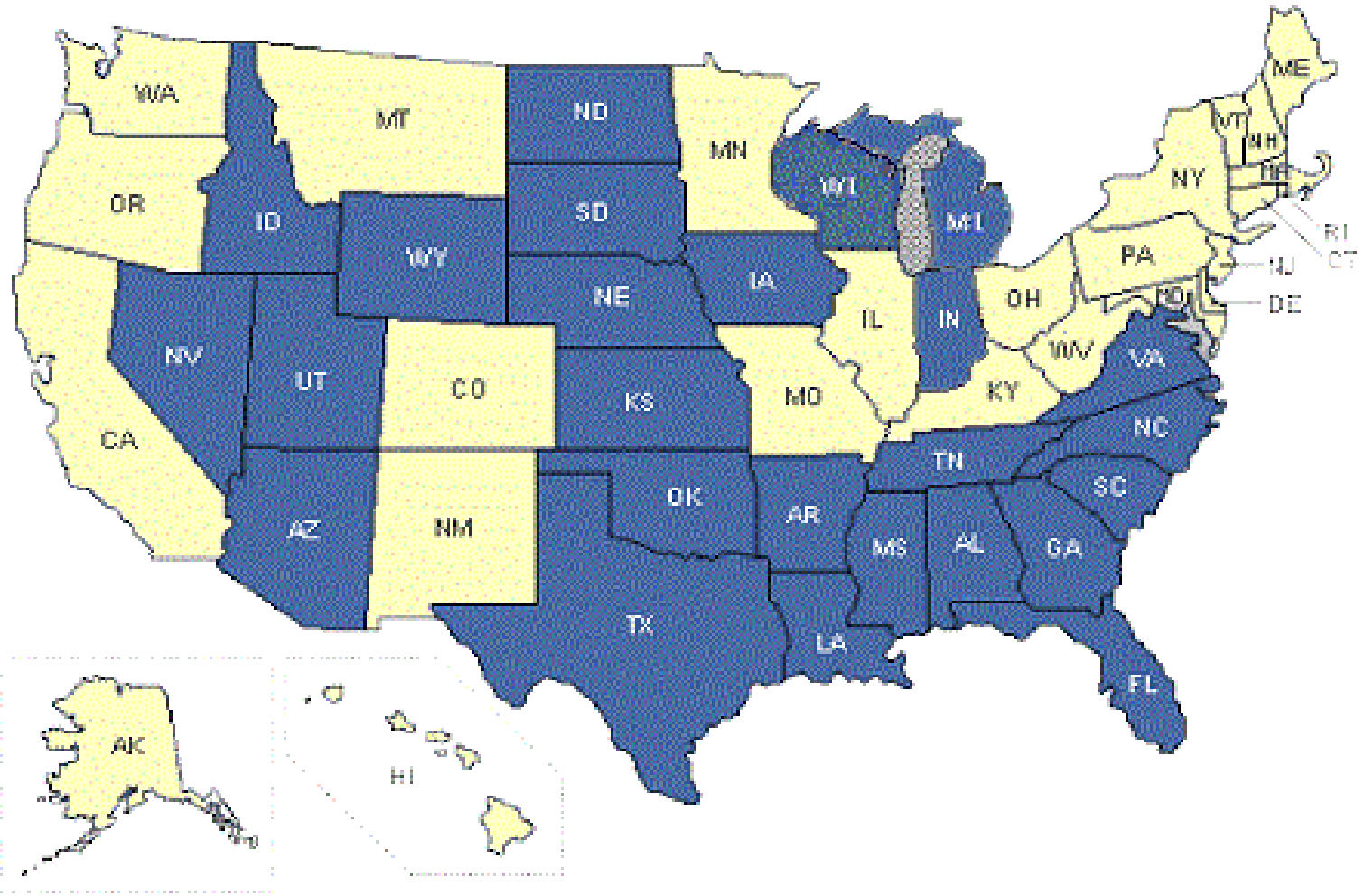
- Today
- Raw Material 35-40%
- Direct Labor <10%
- Overhead 50-55%

Taft-Hartley Act 1947

- Section 14B
  - Authorized states to enact “right-to-work” laws
- Supporters
  - Freedom of Choice
- Opponents
  - Free Rider

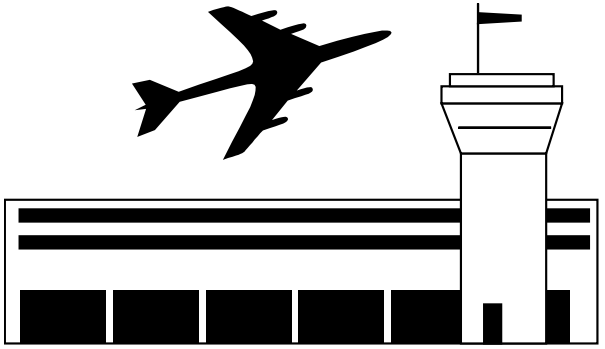


27 States Right to Work (Dark Blue)
23 States Non- Right to Work (Light)



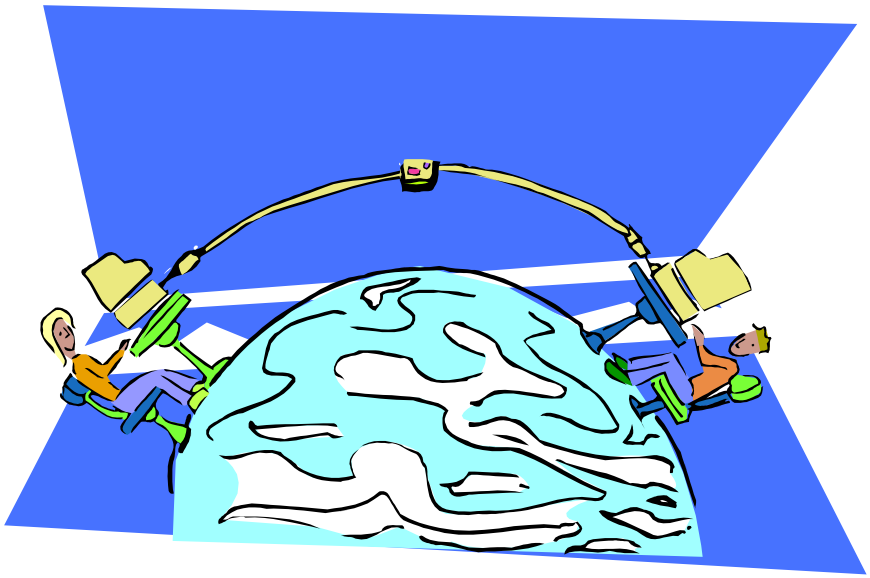
Other Regional Factors

- climate
- taxes
- energy
- transportation



Multinational Company

- A company that has facilities in more than 1 country.
- Facilities could include
- Production
- Sales
- Administrative



International Trade Issues

- Tariffs and Quotas
- Both serve the purpose of controlling the number of foreign products that can enter the domestic market.
- Tariff A tax imposed by a country on an imported good.
- Quota A limit imposed by a country on the quantity of a good which may be imported.
- Both tariffs and quotas will in general raise prices and result in fewer options for consumers.

Multi-National Locations

- Free-Trade
  - NAFTA -- Mexico and Canada
- Long Term Movement
- Toward Free Trade – Worldwide
- Free Trade Based on Economics Principle
- of Comparative Advantage
- Which States that All Trading Partners Benefit from Free Trade
- Other Short to Intermediate Term Considerations
- Exchange Rates
- Political Stability
- Tax System

- Markets Markets Markets

Community Factors

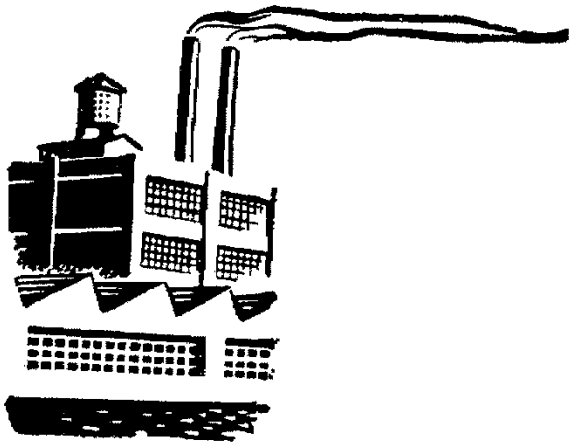
1. **taxes**
2. **zoning**
3. **education public vs. private**
   higher education opportunities
4. **transportation**
   - **air facilities**
   - **truck**
   - **railroad**
   - **water**
5. **religious diversity**
6. **quality of police and fire protection**
7. **size of community**
8. **site availability**

Site-related Factors

- land cost
- transportation
- environmental/ zoning/ legal

Industrial Parks

- Segregating industry from residential areas
- Gives a community an advantage in recruiting industry

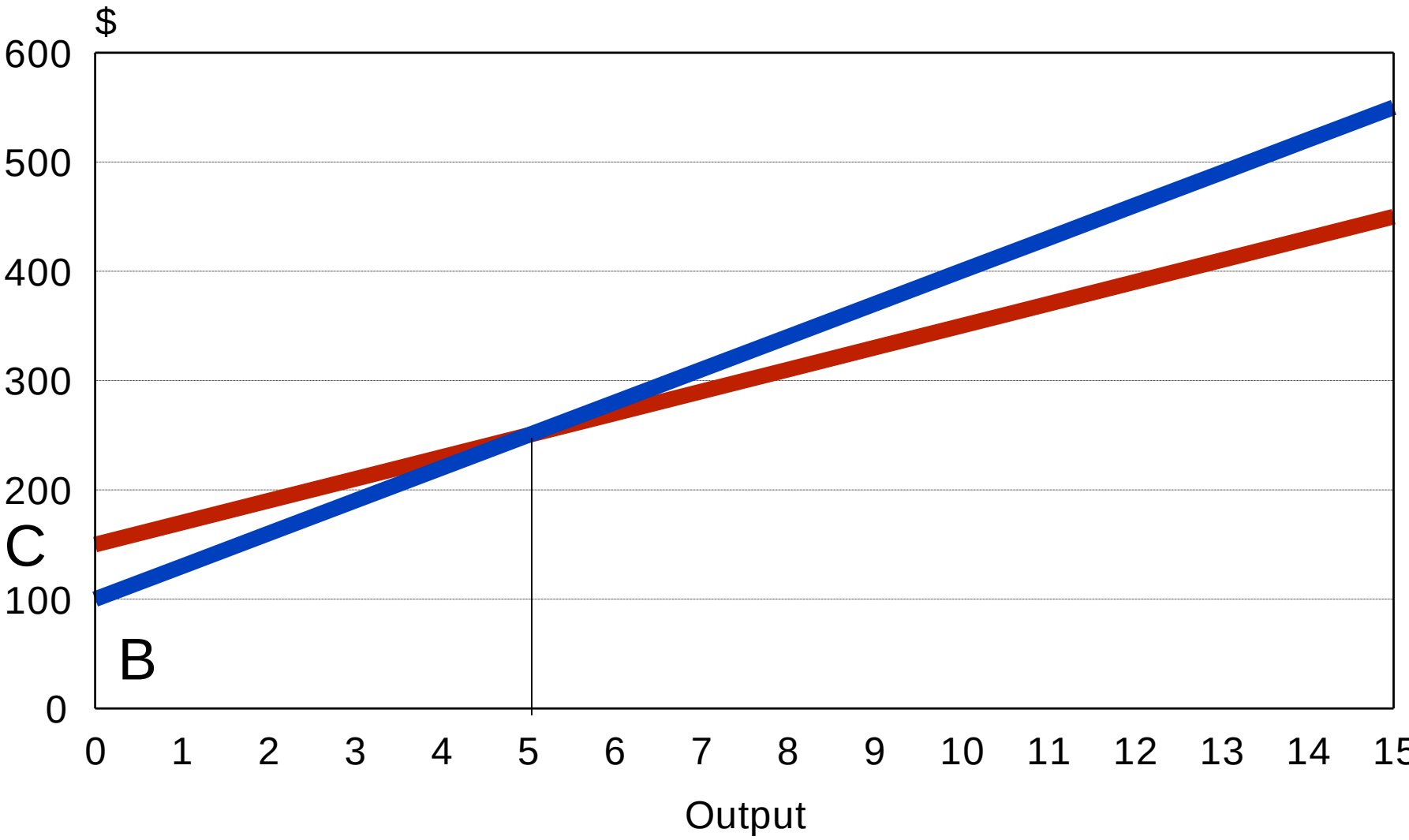


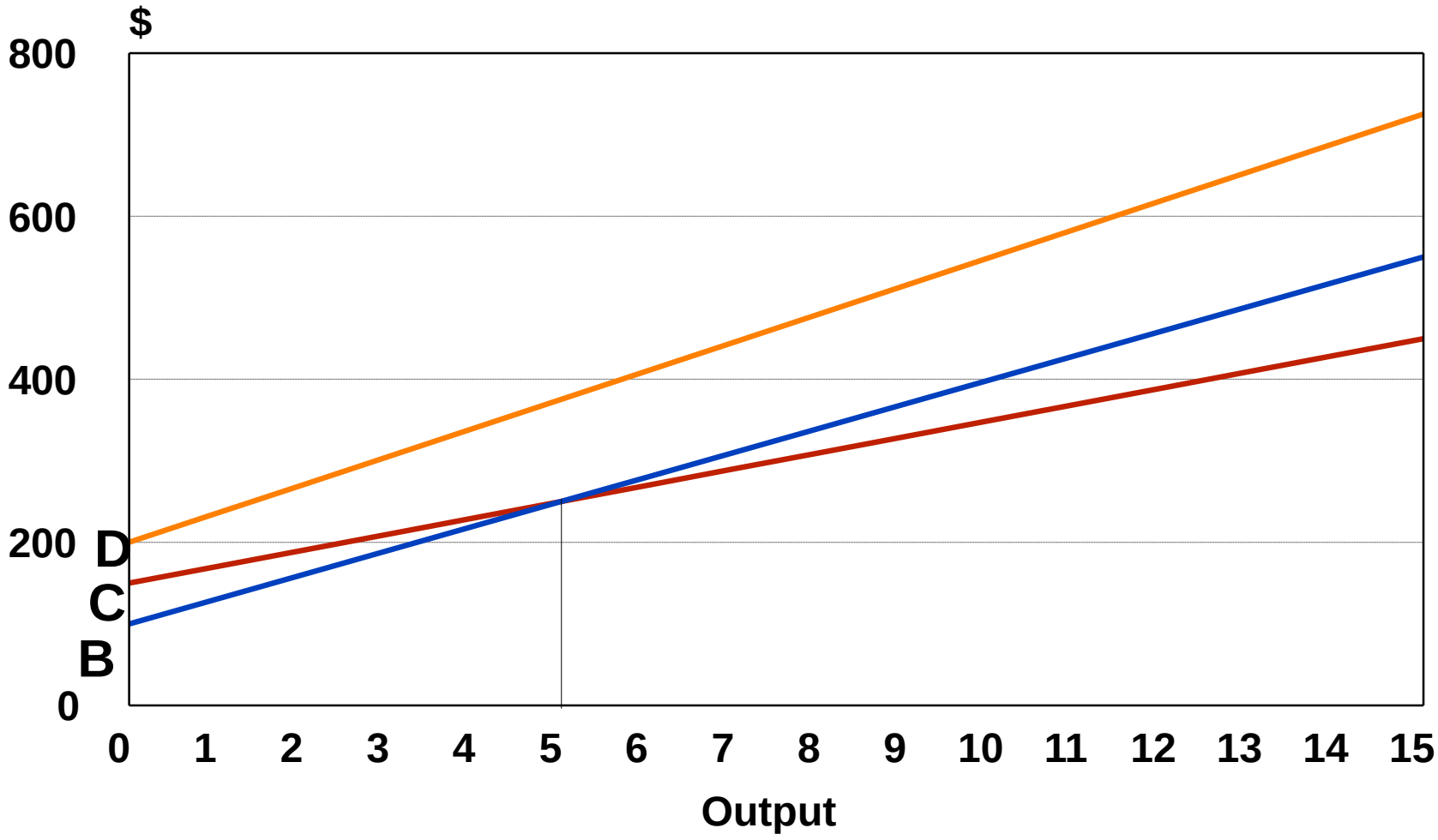
Break-Even Analysis

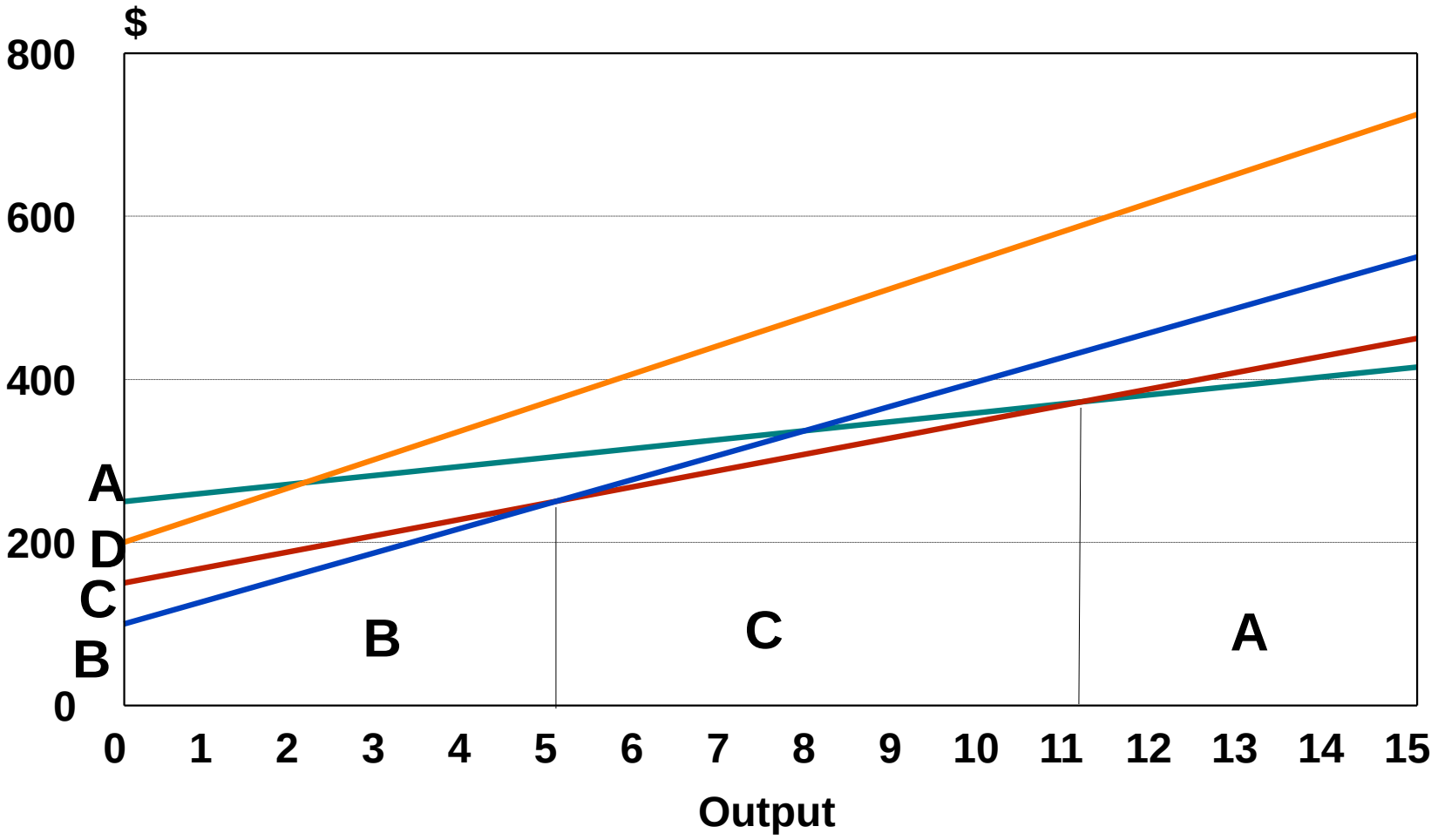
Location	Total Fixed Cost	Variable Cost (Per Unit)
A	250,000	11
B	100,000	30
C	150,000	20
D	200,000	35

Cost with Output of 10,000 Units

Location	TFC($)	TVC($) (10,000*VC)	TC($)
A	250,000	110,000	360,000
B	100,000	300,000	400,000
C	150,000	200,000	350,000
D	200,000	350,000	550,000


$
600
500
400
300
200
C
100
B
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Output


$
800
600
400
200
D
C
B
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Output


$
800
600
400
200
0
A
D
C
B
B
C
A
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Output

Indifference Point

$$B = C$$

$$100{,}000+30X = 150{,}000+20X$$

$$X = 5{,}000$$

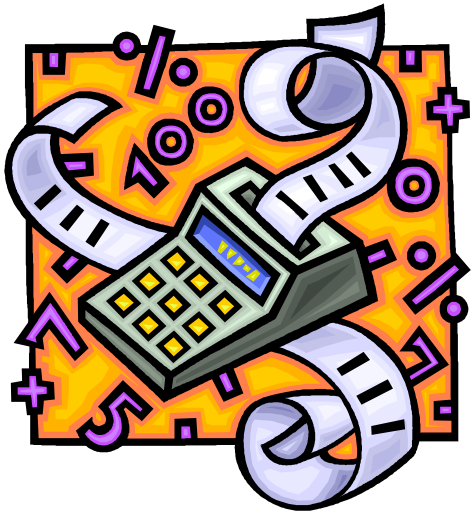
Indifference Point

C = D

150,000+20X = 200,000+35X

X=-3,333

How Do You Interpret The Negative Number?

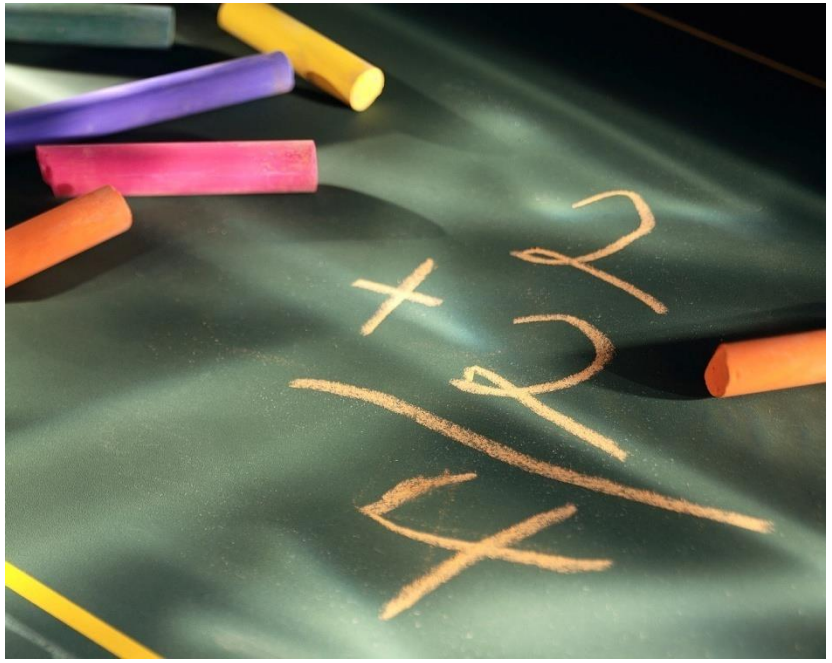


Indifference Point

C = A

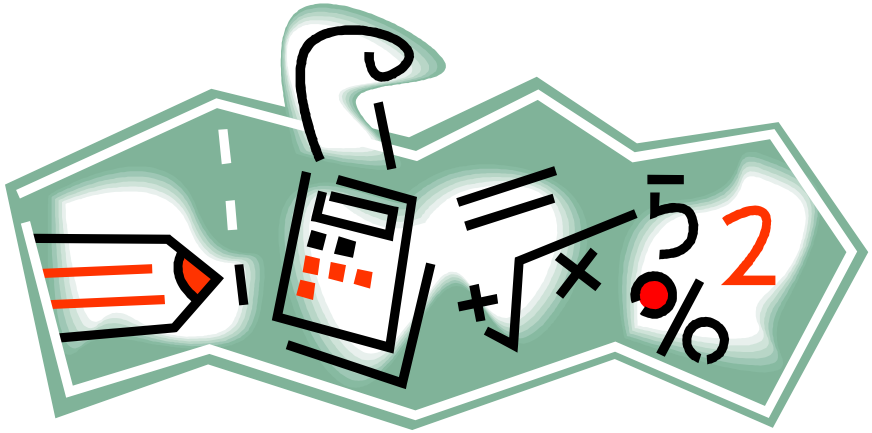
150,000+20X = 250,000+11X

X = 11,111



Summary

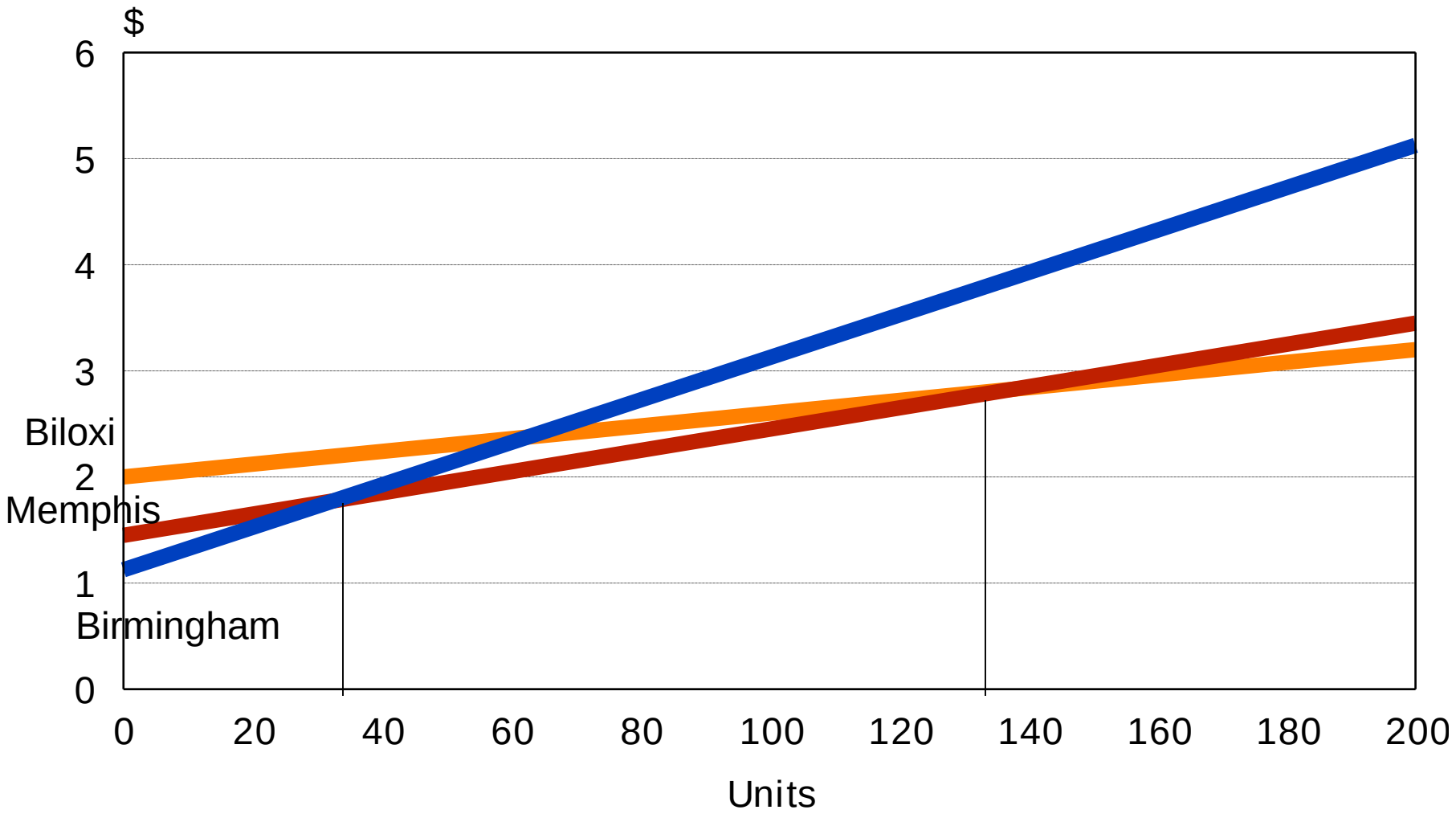
<5,000	B
>5,000 & < 11,111	C
>11,111	A



Homework Problem 4

- A firm that has recently experienced an enormous growth rate is seeking to lease a small plant in either Memphis, Biloxi, or Birmingham. Prepare an economic analysis of the three locations given the following information:

- Annual costs for building, equipment, and administration would be $1,400,000 for Memphis, $1,940,000 for Biloxi, and $1,100,000 for Birmingham. Labor and material are expected to be $10 per unit in Memphis, $6 per unit in Biloxi, and $20 per unit in Birmingham. The Memphis location would increase system transportation costs by $50,000 per year, the Biloxi location would increase them by $60,000 per year, and the Birmingham location would increase those costs by $25,000 per year. Expected annual volume is 60,000 units.


$
6
5
4
3
Biloxi
2
Memphis
1
Birmingham
0
0
20
40
60
80
100
120
140
160
180
200
Units

Homework Problem 5

- A retired auto mechanic hopes to open his own rust-proofing shop. Customers would be area new car dealers. Two locations are being considered, one in the center of the city and one on the outskirts of the city. The in-city location would involve fixed monthly costs of $7,000 and labor,materials and transportation costs of $10 per car. The outside location would have fixed monthly costs of $4,800 and labor, materials, and transportation costs of $18 per car. Dealer price at either location will be $90
- per car.
- a. Which location will yield the greatest profit if monthly demand is
- (1) 200 cars?
- (2) 300 cars?
- b. At what volume of output will the two sites yield the same monthly profit?

Calculate Profit

- Total Revenue
- Minus Total Variable Cost
- = Total Contribution
- Minus Total Fixed Cost
- = Net Profit

Four Possible Options

In City Outside

- 200
- 300

Four Possible Options

	In City	Outside
• 200		Best
• 300	Best	

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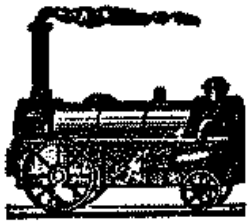
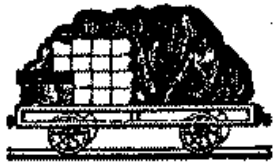
From\To	E	F	G	H	Supply
A	25	35	36	60	15
B	55	30	25	25	6
C	40	50	80	90	14
D	30	40	66	75	11
Demand	10	12	15	9	46\46





Optimal Solution

COST $1,835

D-H 3 units

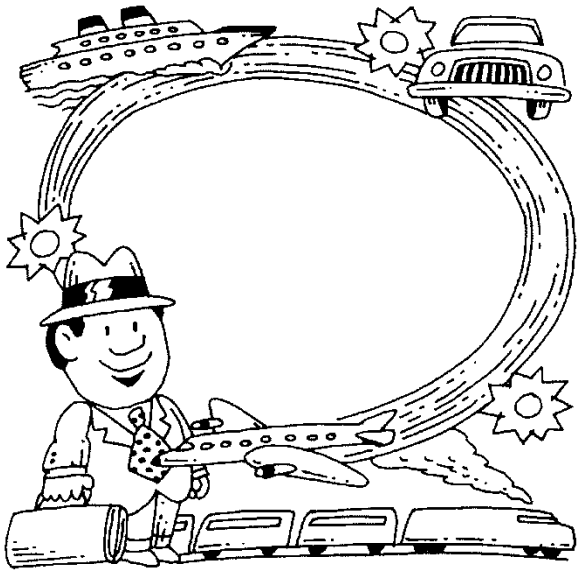
D-E 8 units

C-F 12 units

B-H 6 units

C-E 2 units

A-G 15 units



Operation Homework # 6

- Solve the following transportation problem.

From\To	A	B	C	D	Supply
1	10	10	9	15	360
2	9	8	5	10	250
3	8	5	13	7	300
Demand	260	400	250	300	1210/910

From\To	A	B	C	D	Supply
1	10	10	9	15	360
2	9	8	5	10	250
3	8	5	13	7	300
DUMMY	0	0	0	0	300
DEMAND	260	400	250	300	1210\1210

Note Supply=Demand

Balanced Problem

Final Cost = 6,350

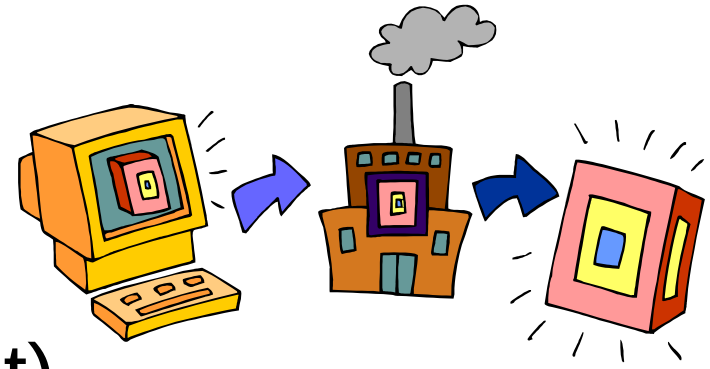
Dummy – D 300

Operations Homework # 7

From\To	D	E	F	G	H	Supply
A	10	40	10.4	17	10.3	520
B	8.5	25	7.5	2.5	4	200
C	10.5	10	9	8.4	3.5	200
Demand	150	200	250	190	130	920\920

- Note: Problem is Balanced

3 Possible Conditions



Demand=Supply Balanced

Demand>Supply

Add a Dummy Row (Plant)

Some Demand will be Un-Filled

Demand<Supply

Add a Dummy Column (Customer)

Build Inventory for the Future

Or Don’t Produce to Capacity