

Figure 4.1 LOCATIONAL CHOICE USING A MANUAL PRESCRIPTIVE TECHNIQUE

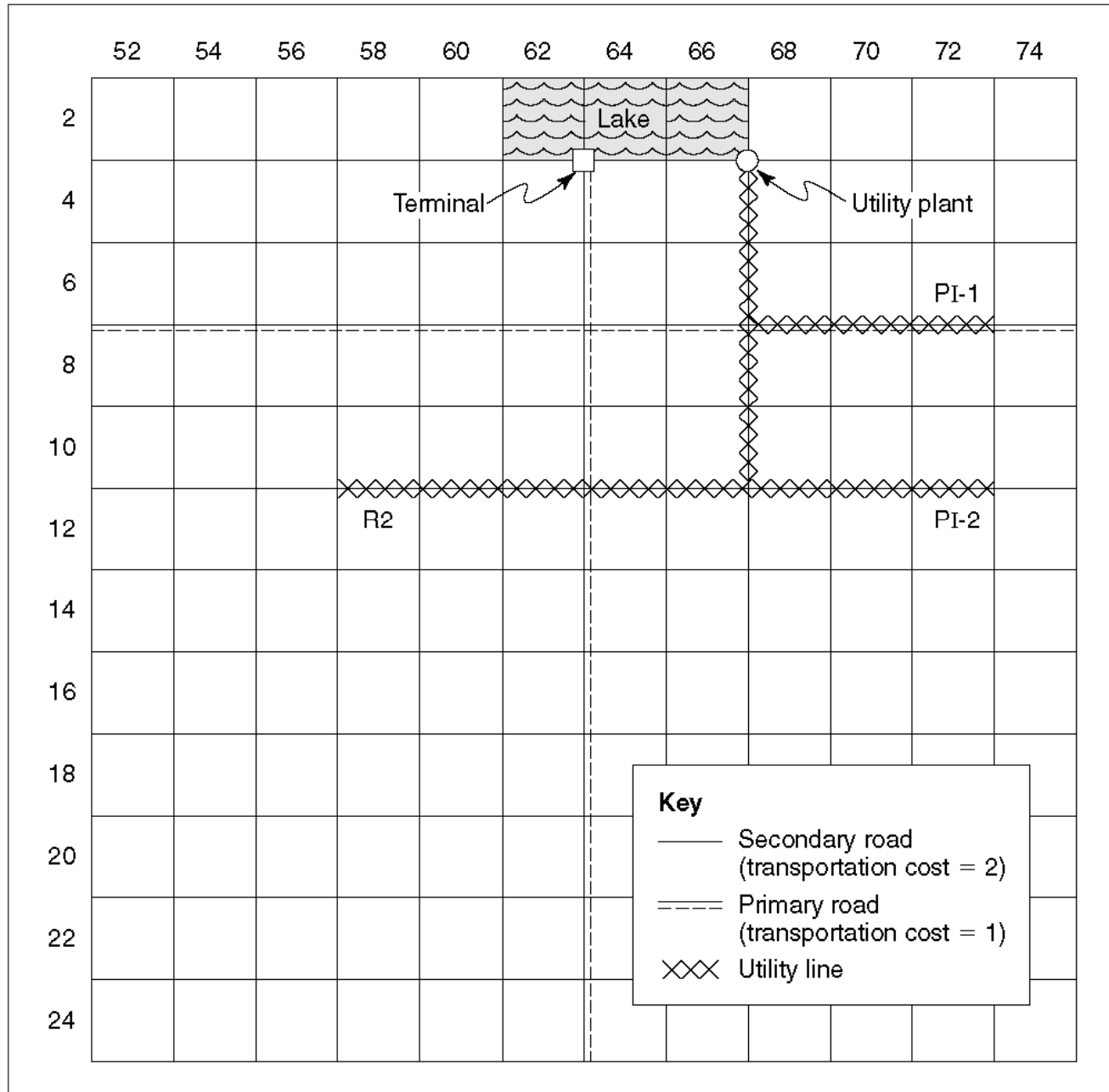
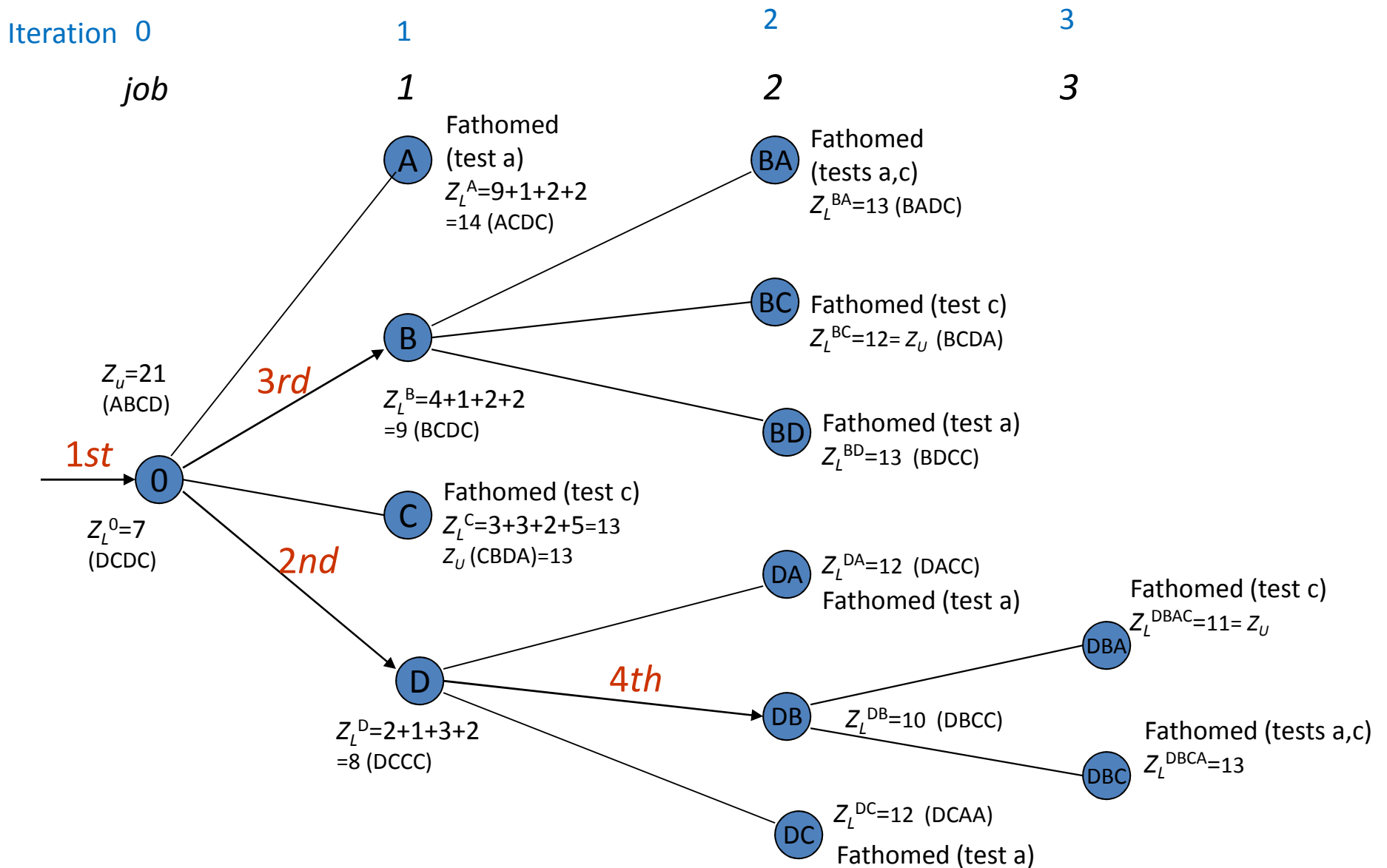


Table 4.1 SITE LOCATION COST OF INDUSTRIAL PLANTS

		Sites			
		1	2	3	4
Plants	A	9	5	4	5
	B	4	3	5	6
	C	3	1	3	2
	D	2	4	2	6

Figure 4.2 Branch-and-bound tree



Bounding concept in B&B

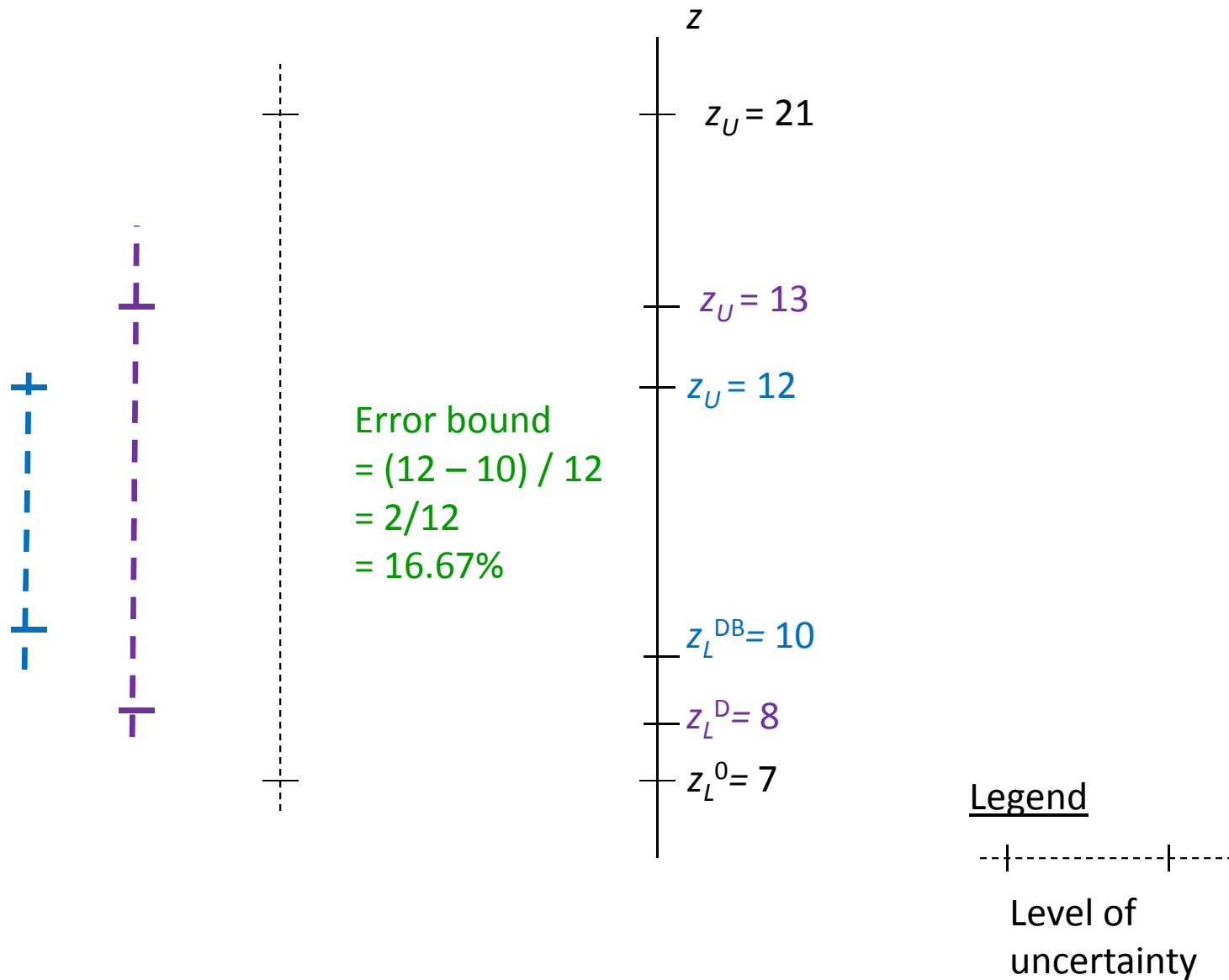
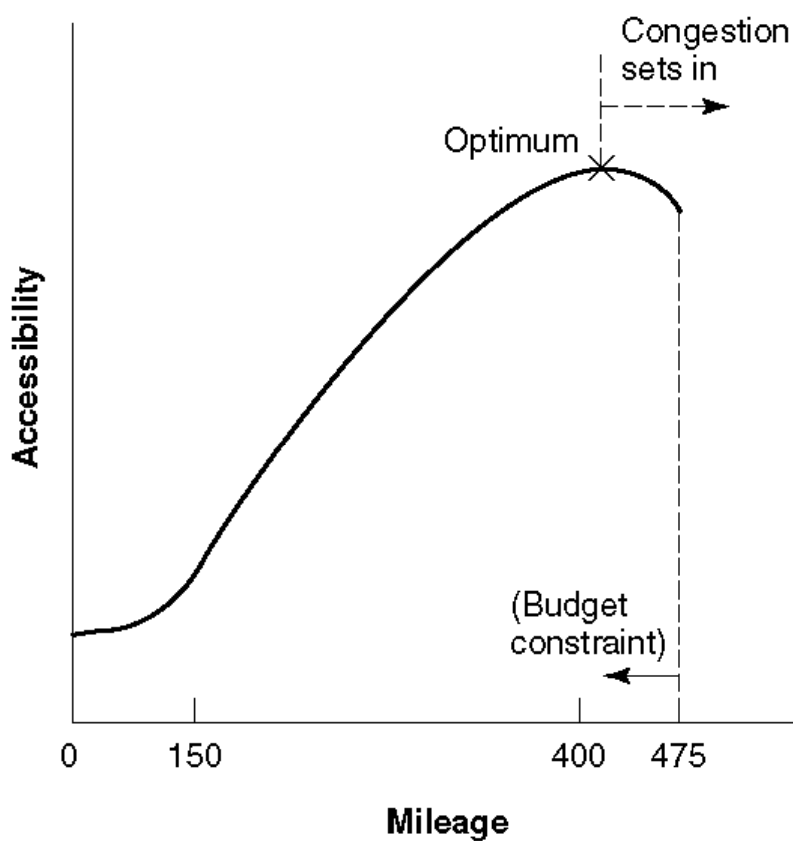


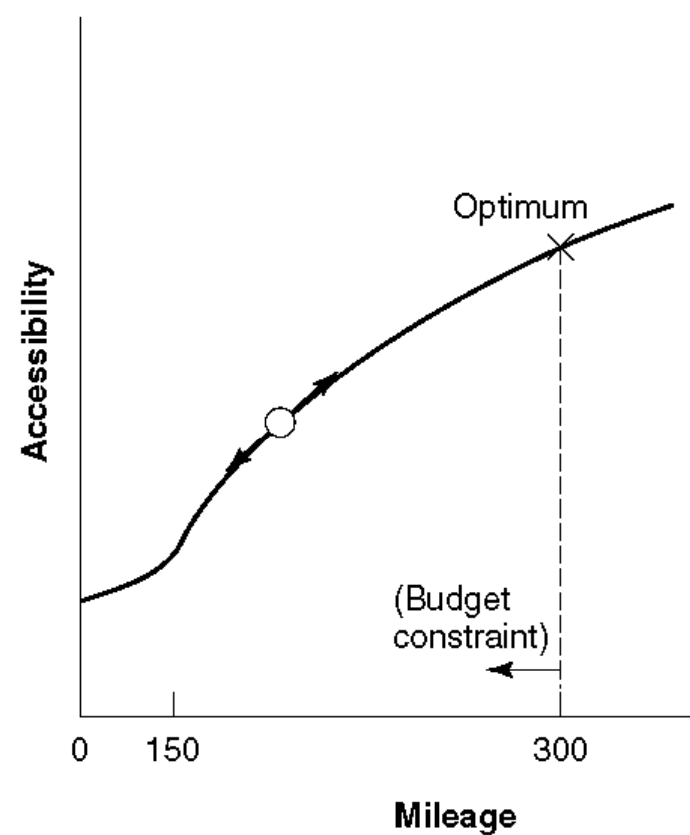
Table 4.2 MODIFIED SITE LOCATION COST DURING BRANCH AND BOUND

		Sites			
		1	2	3	4
Plant	<i>A</i>	(0)	5	4	5
	<i>B</i>	4	3	5	6
	<i>C</i>	3	(1)	3	(2)
	<i>D</i>	2	4	(2)	6

Figure 4.3 A DIRECT SEARCH TECHNIQUE

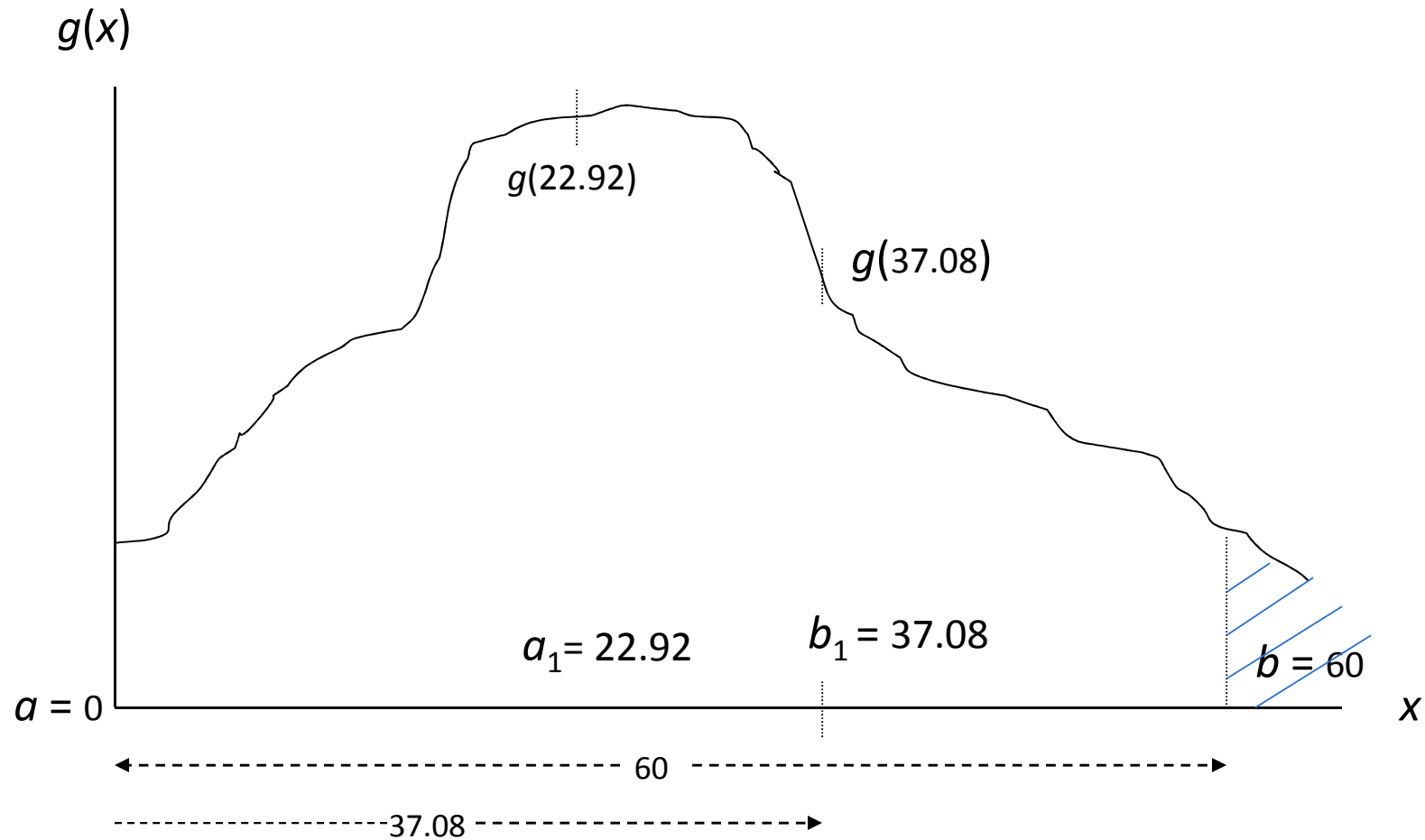


(a) Unconstrained optimization



(b) Constrained optimization

Figure 4.4(a) A unimodal function



Intervals of uncertainty

Figure 4.4(b) Iteration 1

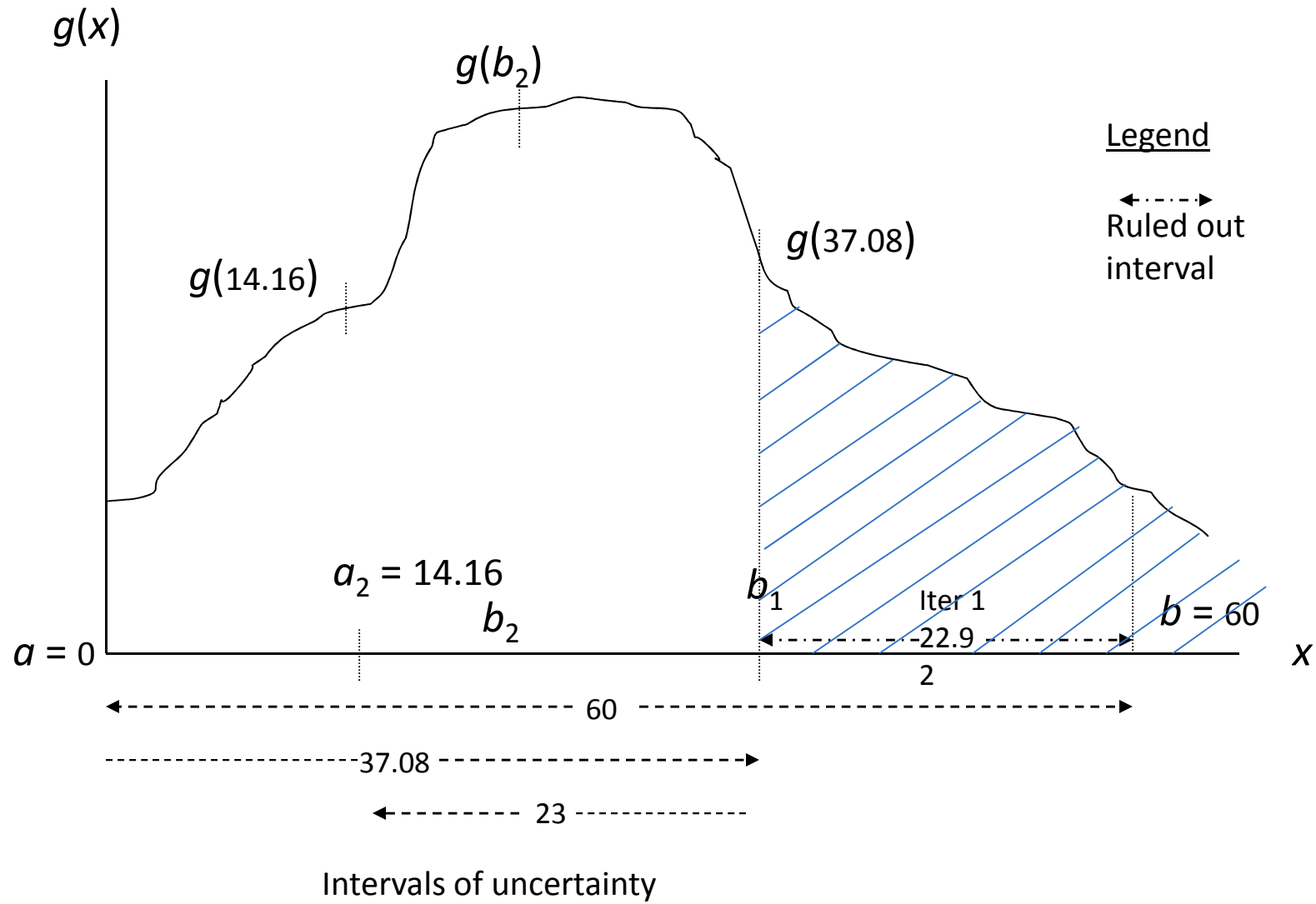


Figure 4.4(c) Iteration 2

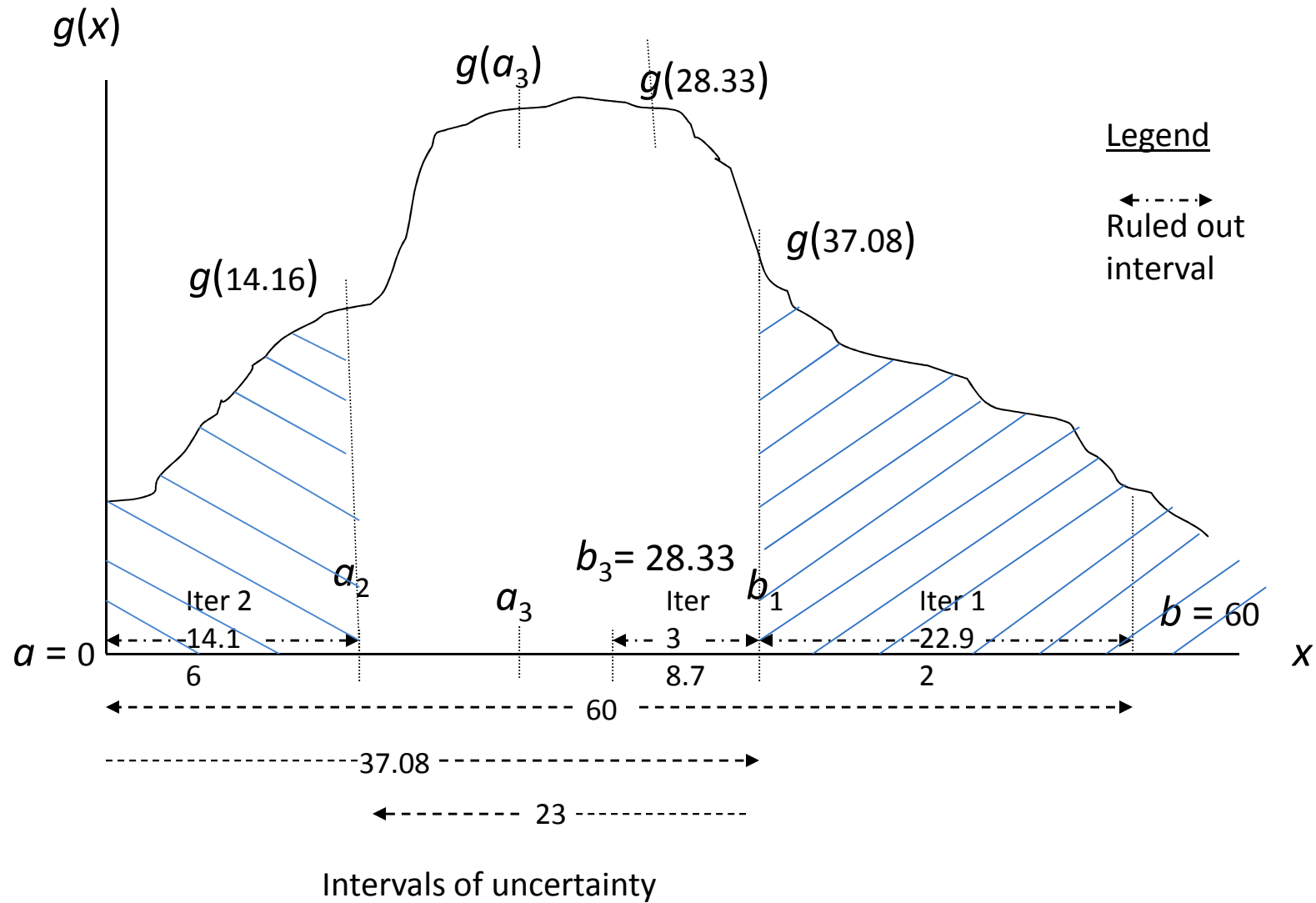


Figure 4.4(d) Iteration 3

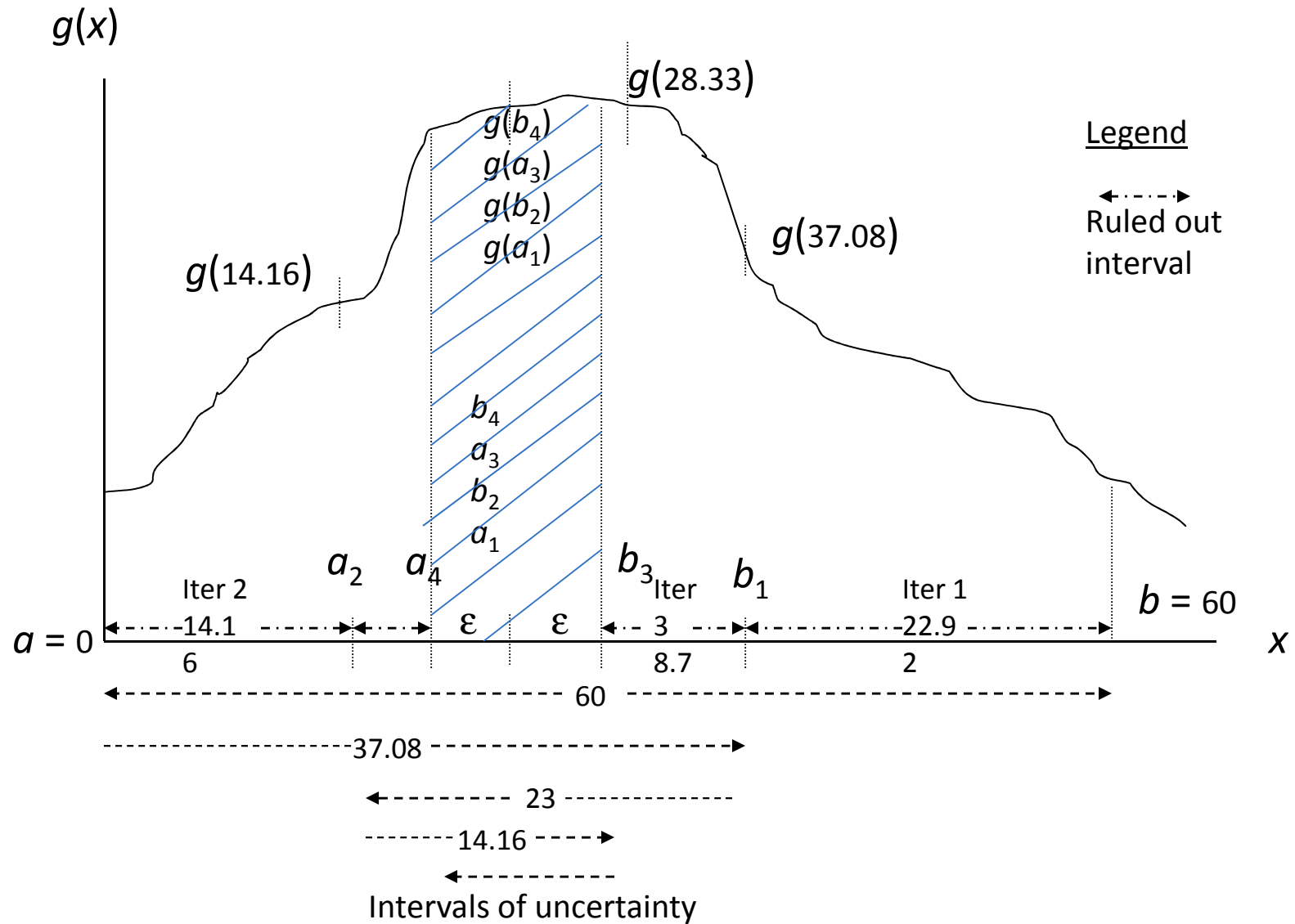


Figure 4.5 - Interval of uncertainty in Fibonacci search

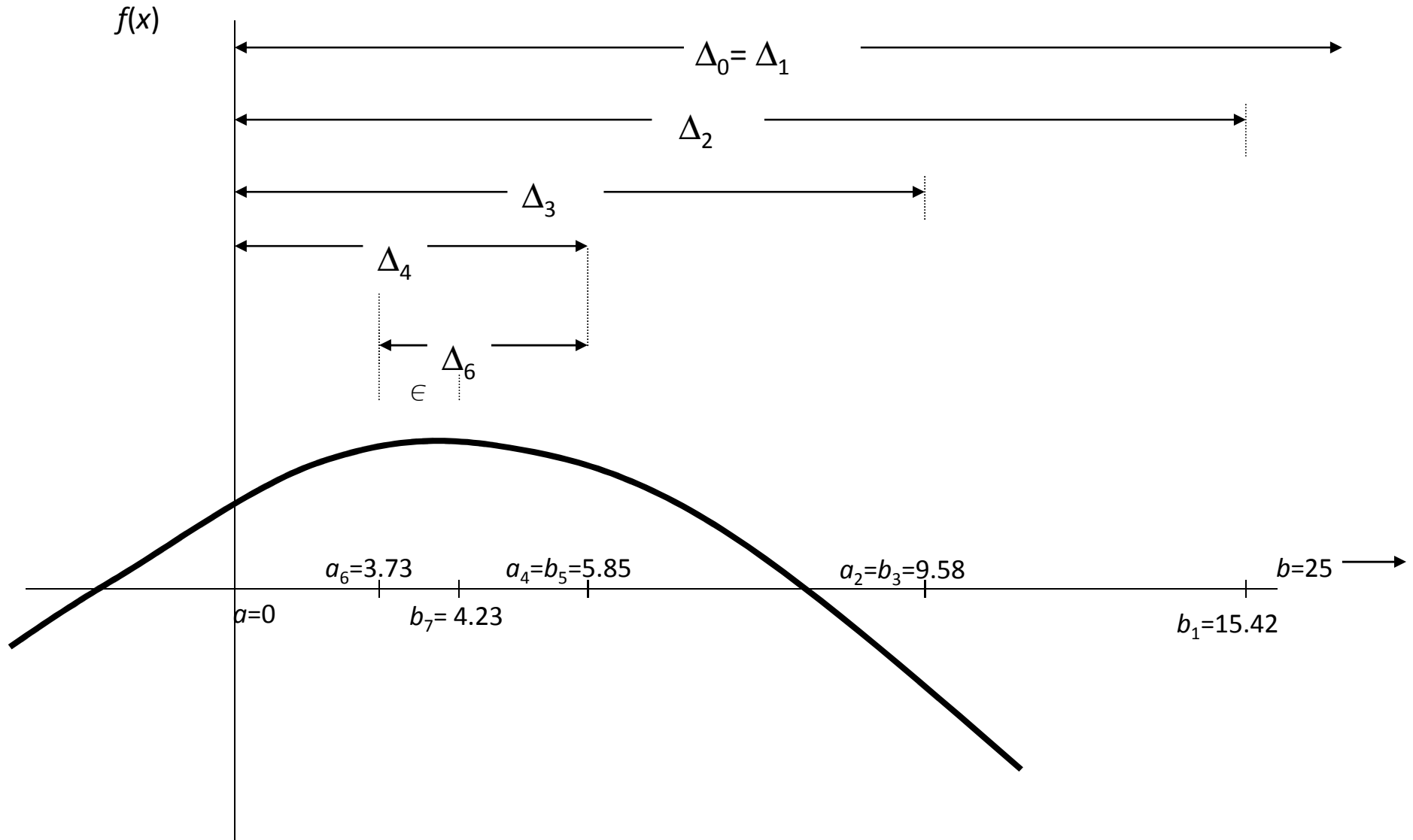


Figure 4.6(a) Roping off an area

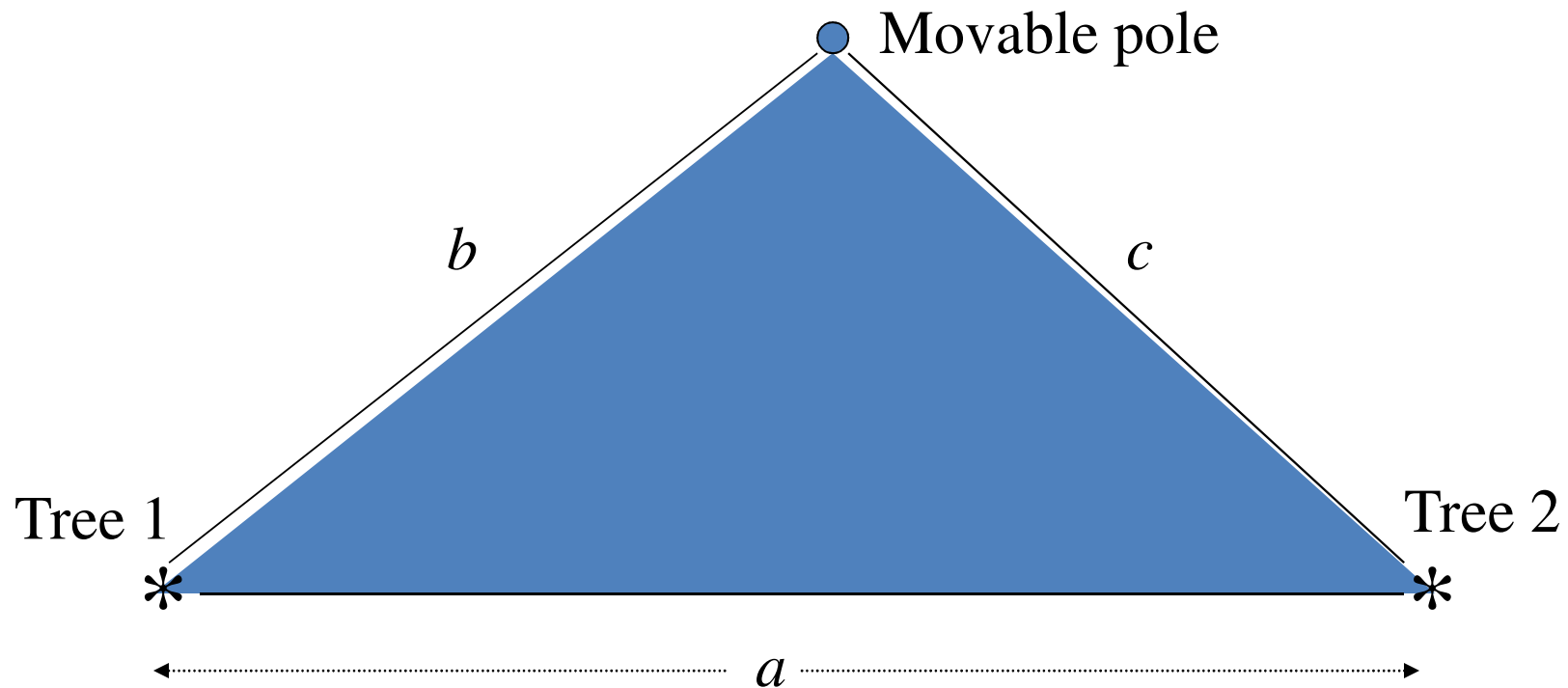


Figure 4.6(b) Roping off an optimal area

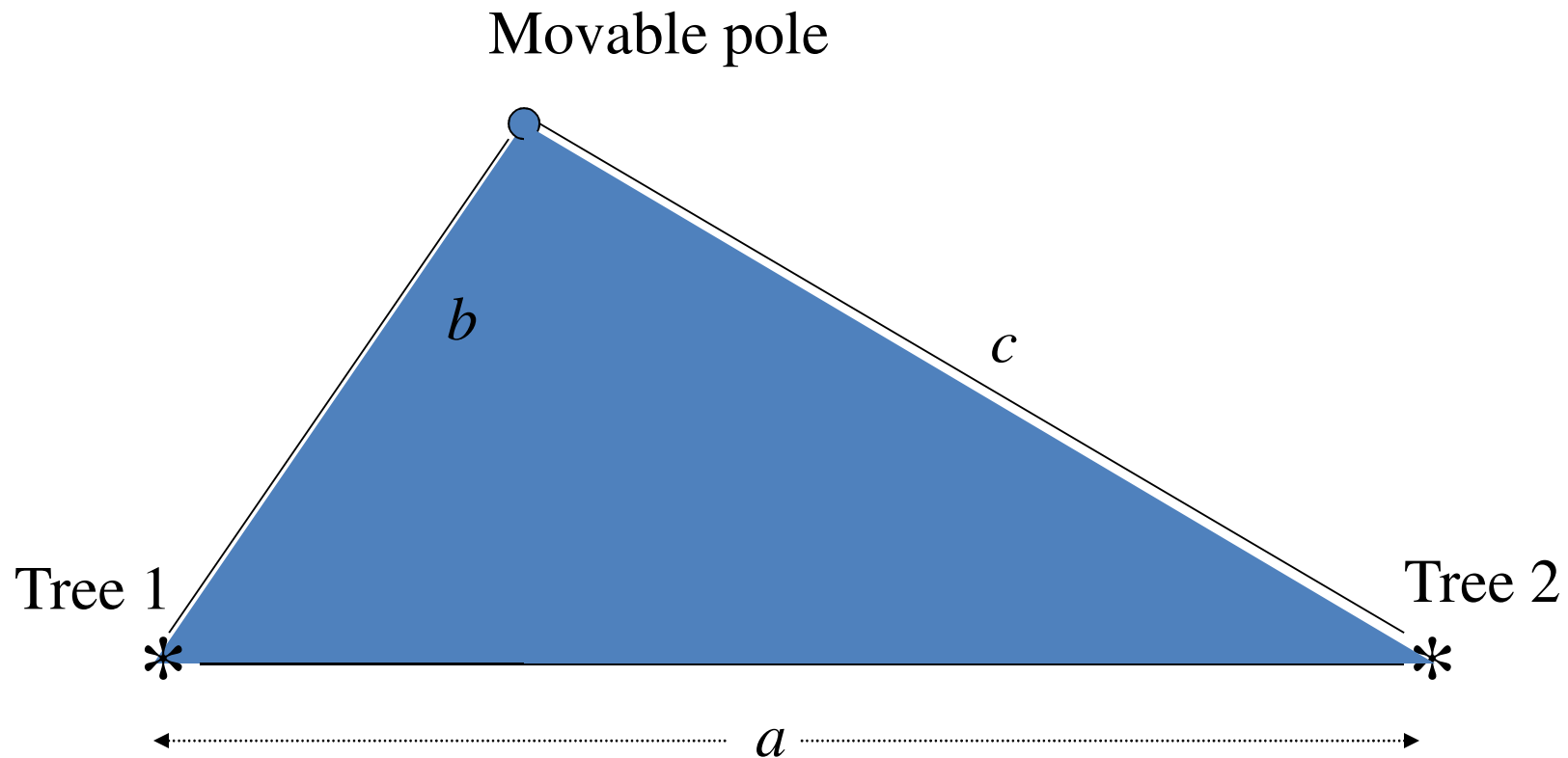


Table 4.3 PRIMAL AND DUAL TABLEAU EXAMPLE

Primal →	x_{11}^1	x_{12}^1	x_{21}^1	x_{22}^1	x_{11}^2	x_{12}^2	x_{21}^2	x_{22}^2	Min ↓
r^1	0.9	0.8	0.6	0.5					≤ 20
r^2					0.9	0.8	0.6	0.5	≤ 15
v_1'	-1	-1			-1	-1			$= -15$
v_2'			-1	-1			-1	-1	$= -10$
Max →	\geq (5 - 4)	\geq (4 - 3)	\geq (3 - 2)	\geq (2 - 1)	\geq (5 - 3)	\geq (4 - 2)	\geq (3 - 1)	\geq (2 - .5)	↑ Dual

Figure 4.7 GRAPHICAL SOLUTION OF AN AIRPORT LOCATION PROBLEM

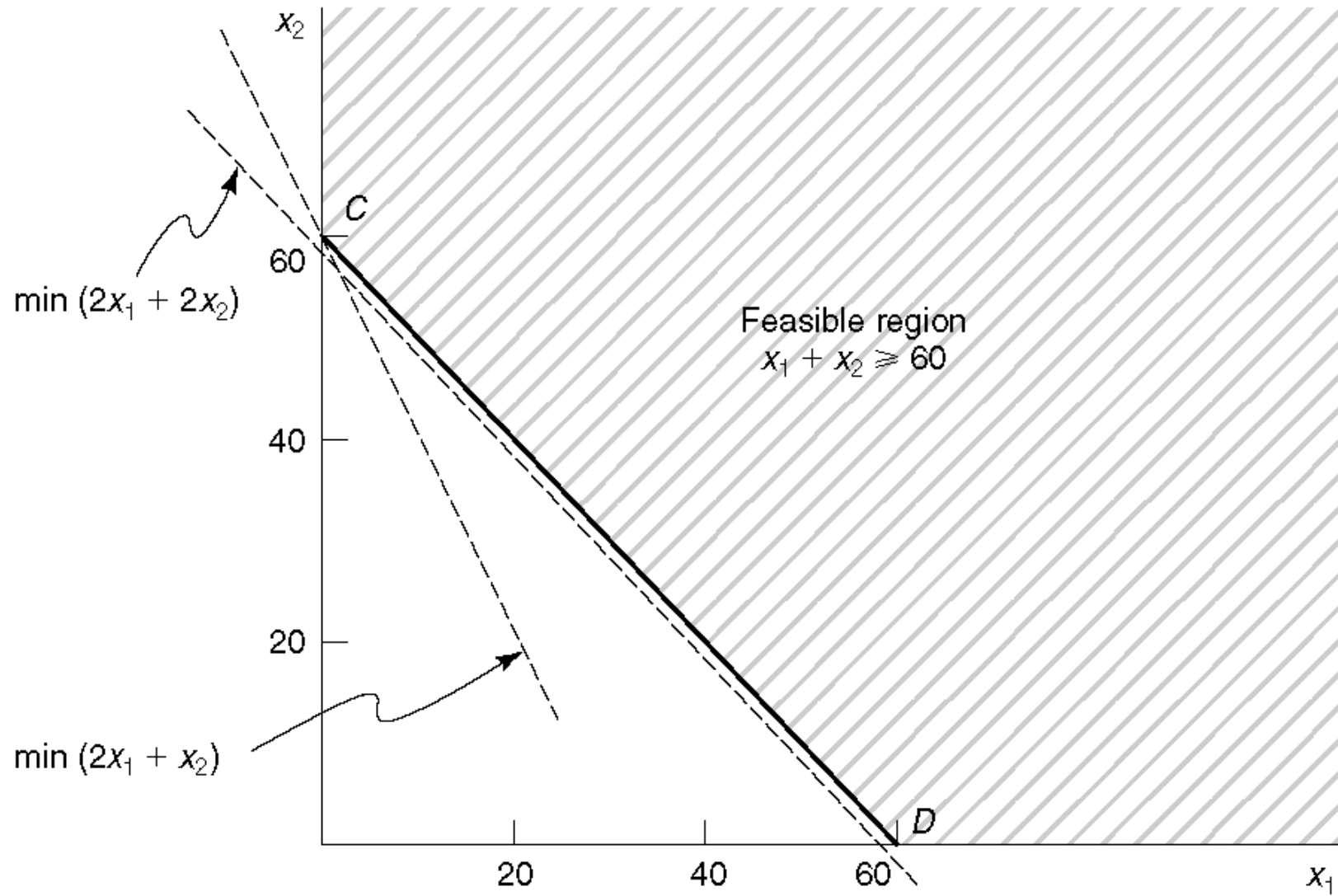


Figure 4.8 THREE- AND FOUR-CITY EXTENSION OF THE AIRPORT LOCATION PROBLEM

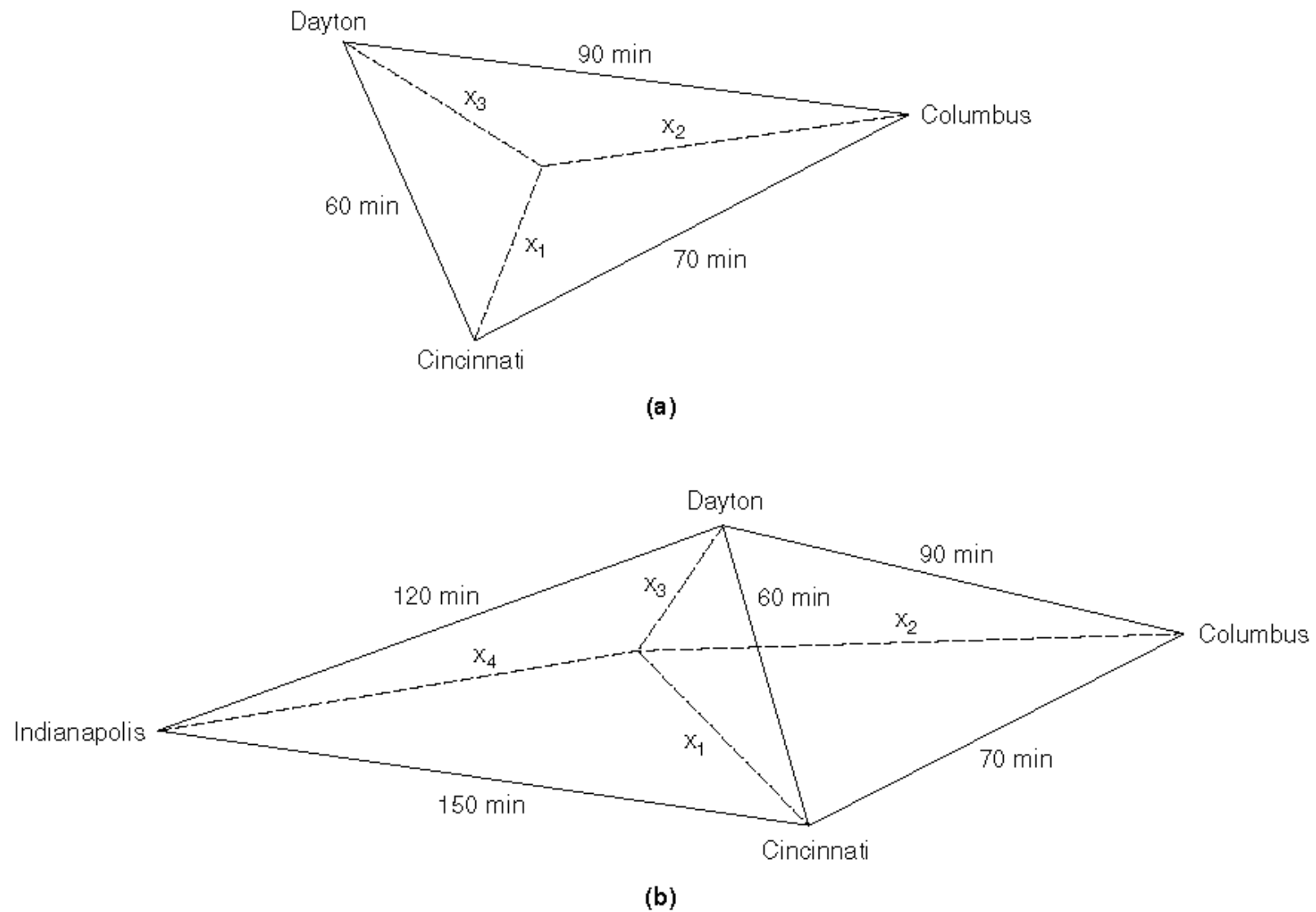


Figure 4.9 SOLUTIONS TO THE THREE-CITY CONFIGURATION

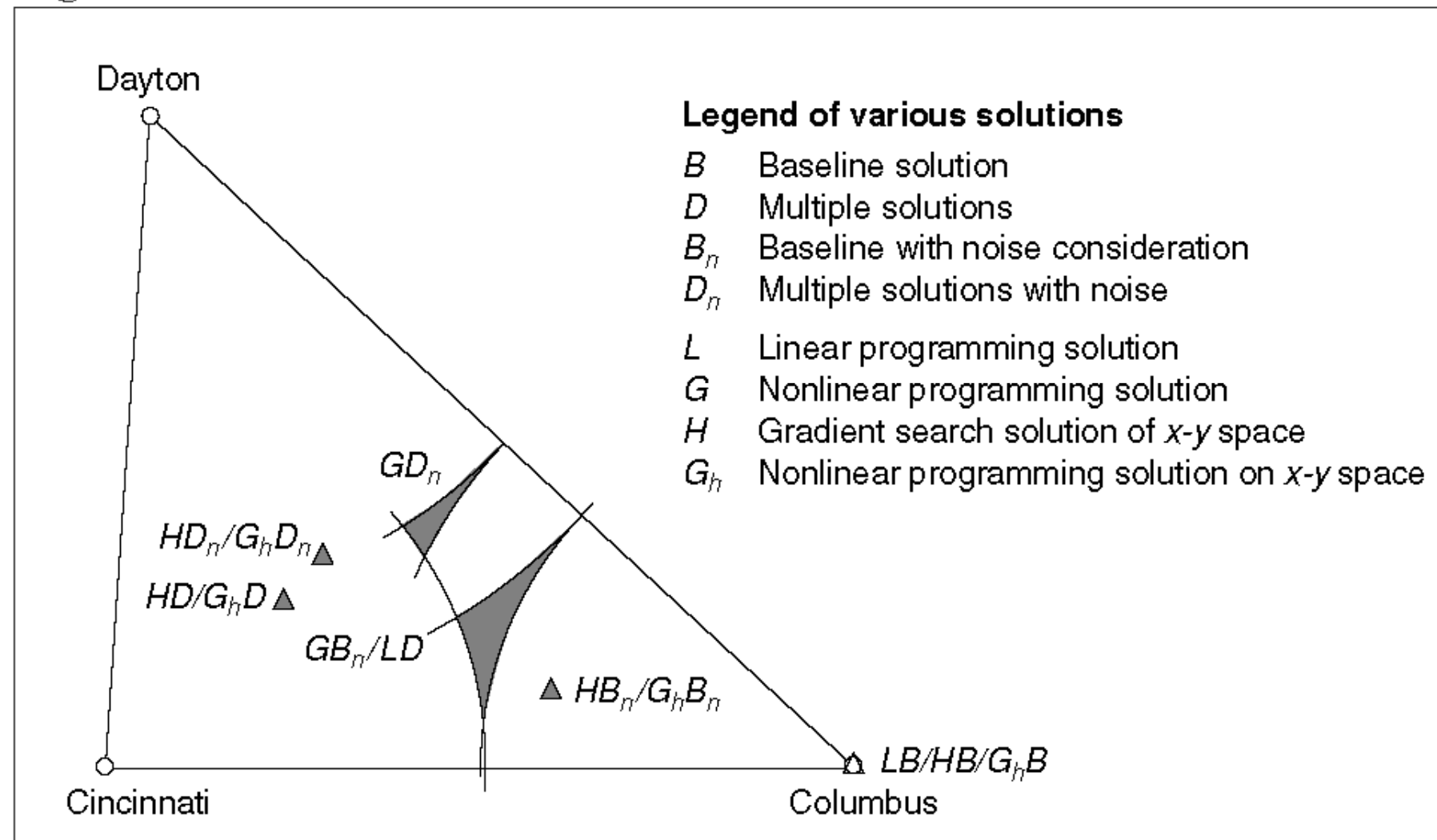


Figure 4.10 SOLUTIONS TO THE FOUR-CITY CONFIGURATION

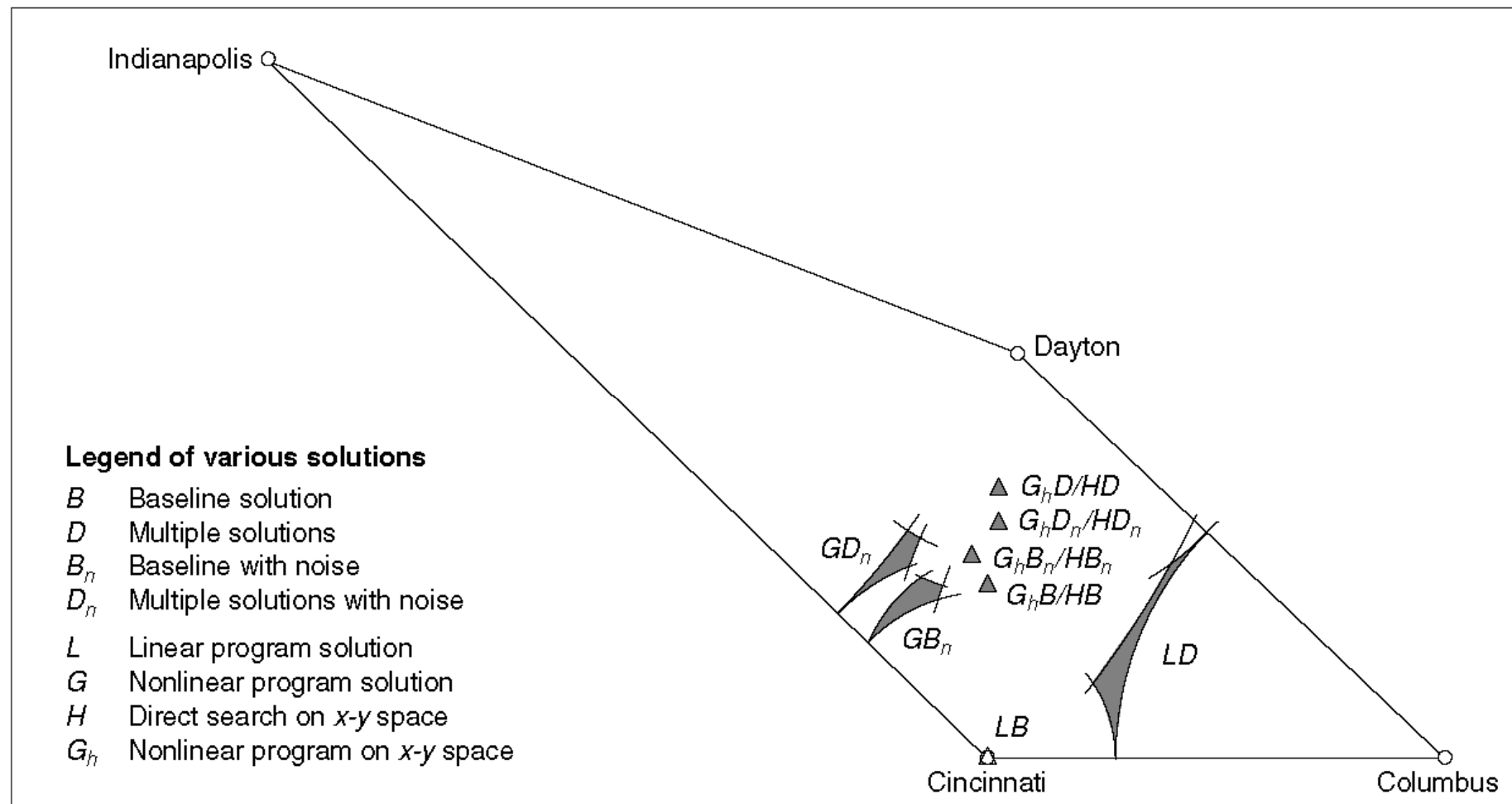
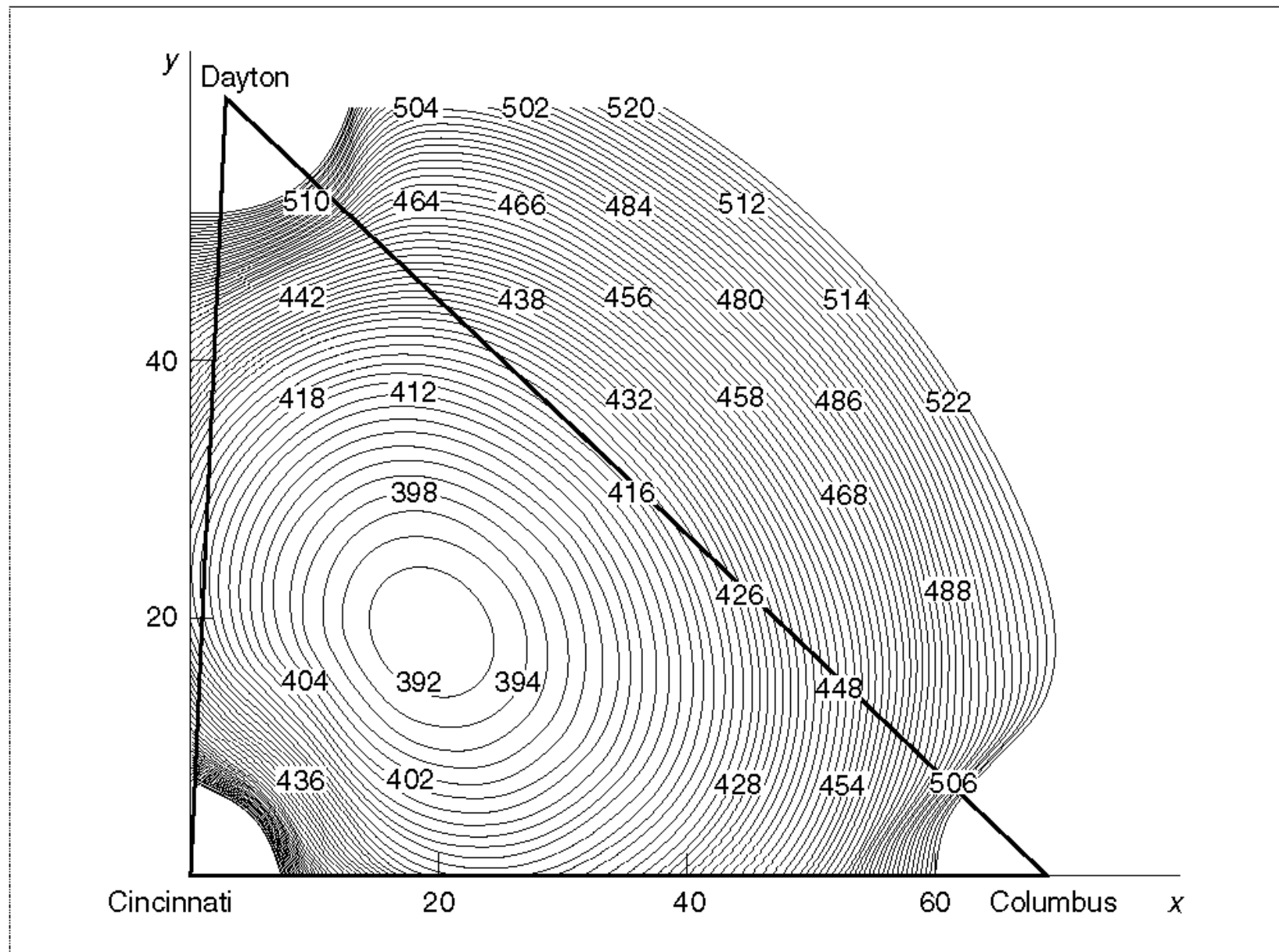


Figure 4.11 GRADIENT SEARCH SOLUTION TO THREE-CITY CONFIGURATION WITH NOISE



SOURCE: McEachin et al. (1992). Reprinted with permission.

Figure 4.12 Example search

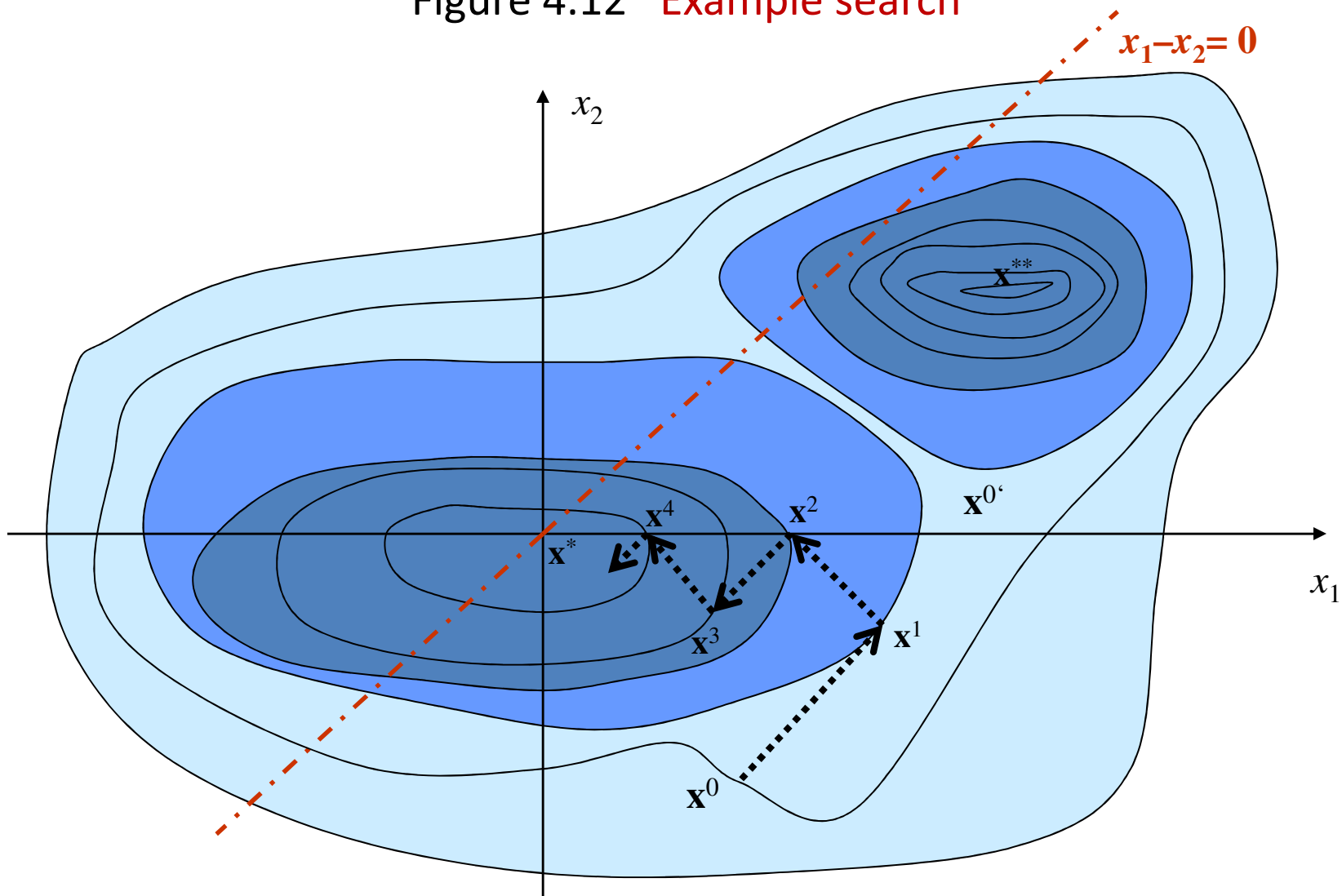


Figure 4.13 MAX IN x AND MIN IN λ

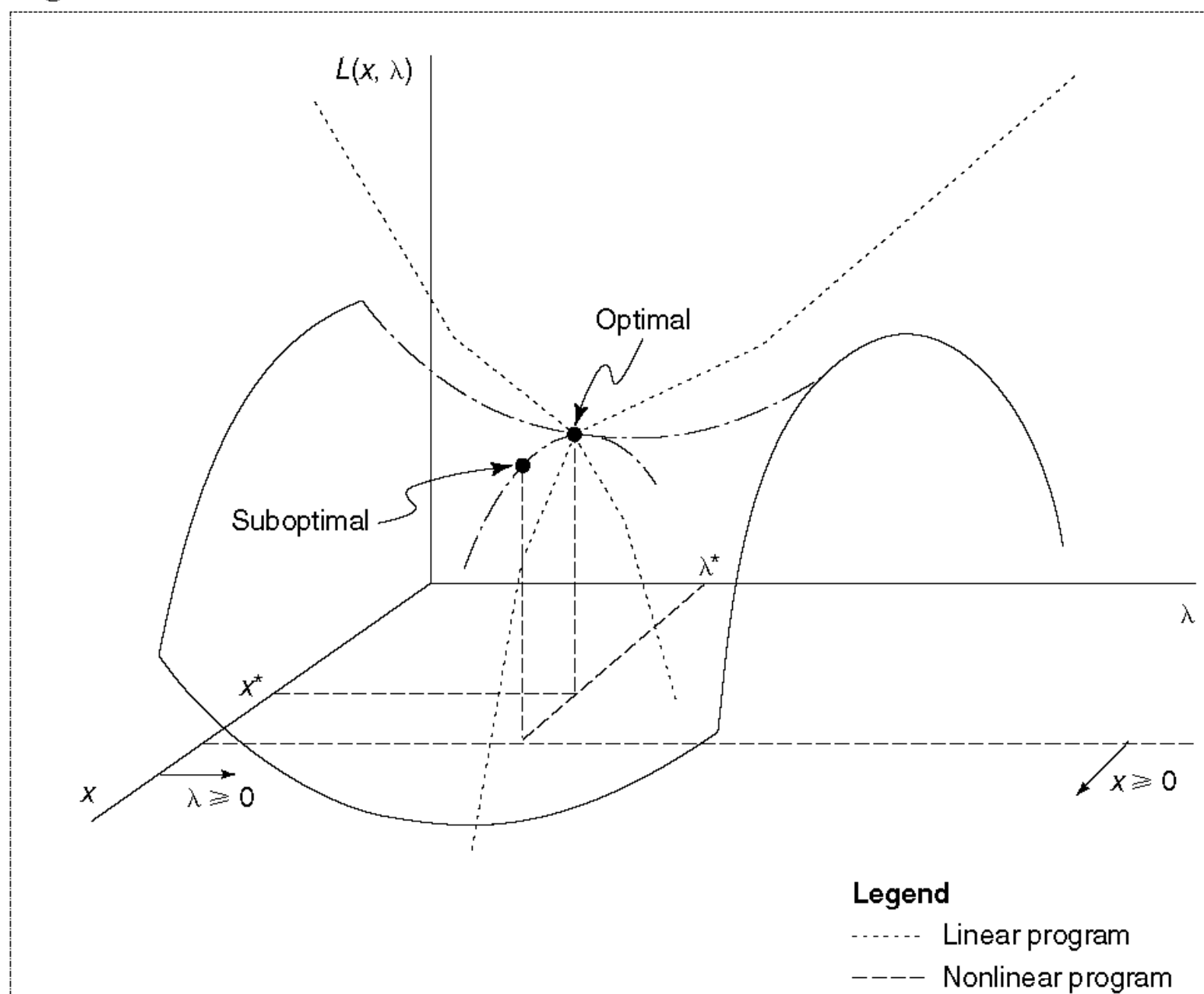


Figure 4.14 (a) Frank-Wolfe algorithm

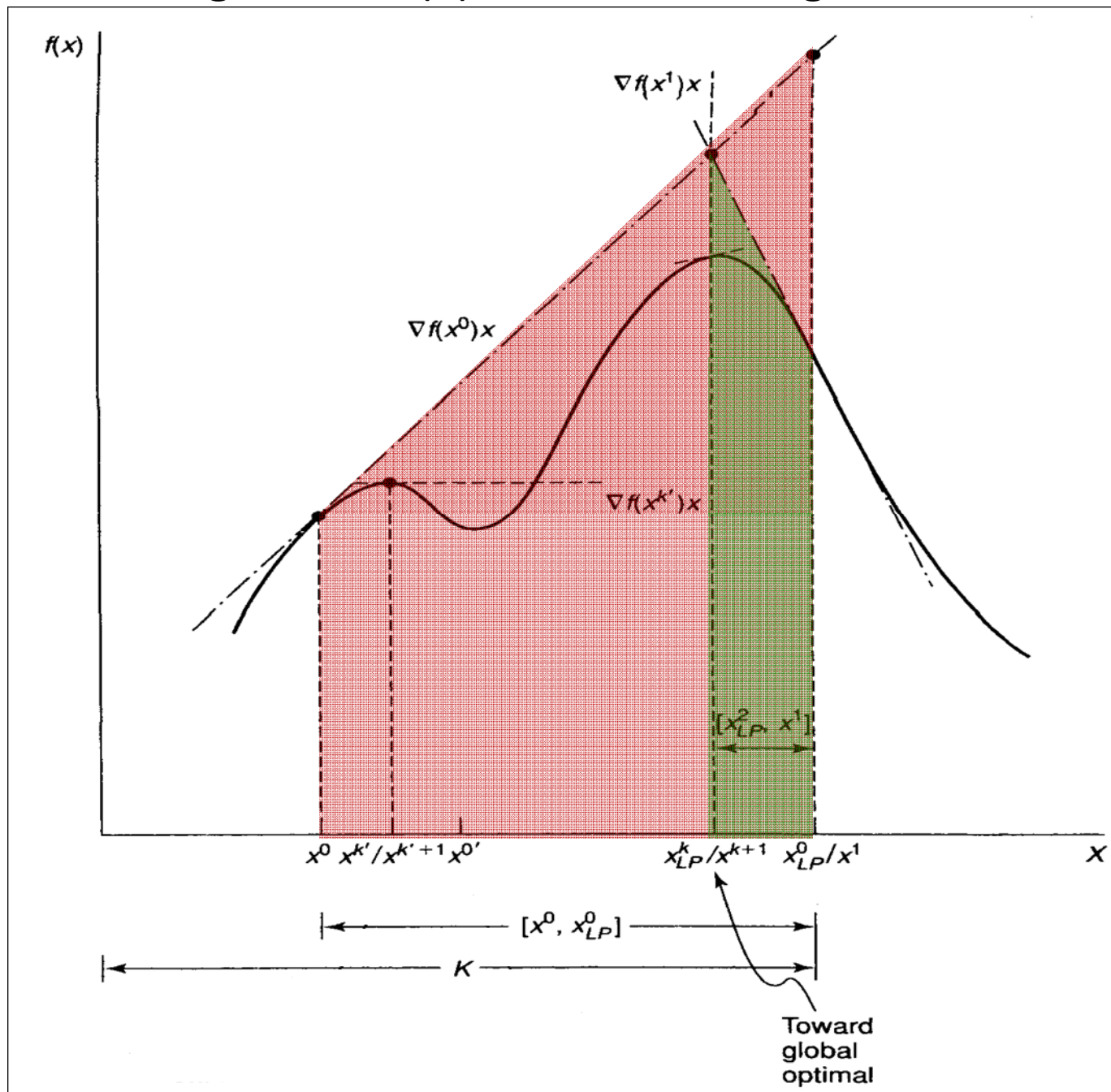


Figure 4.14 (b) Frank-Wolfe algorithm

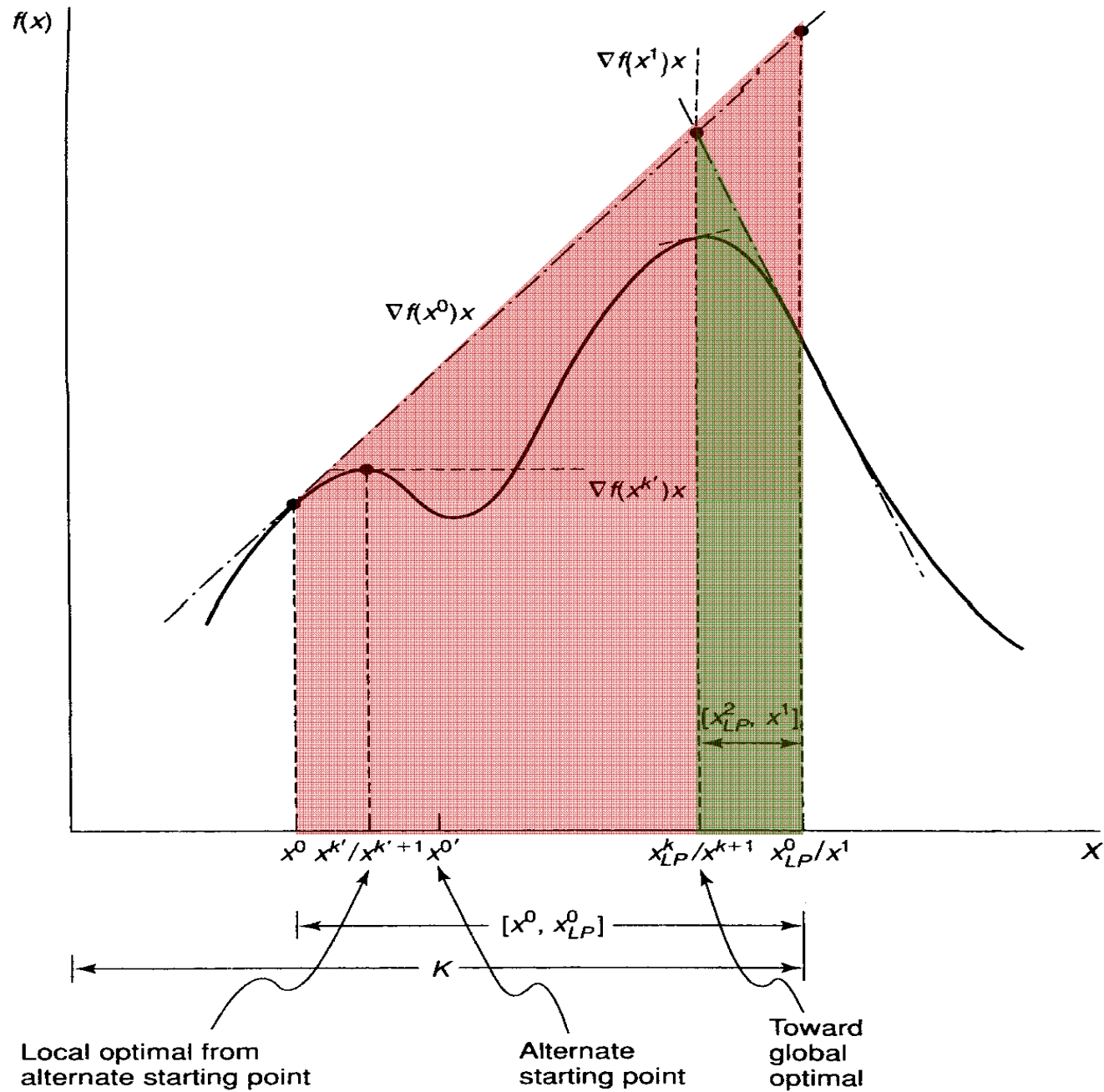


Table 4.4 MATCHING TABLEAU FOR INDUSTRIAL PLANT LOCATION

Node	(A, 1)	(A, 2)	(A, 3)	(A, 4)	(B, 1)	(B, 2)	(B, 3)	(B, 4)	...	(D, 4)	RHS
A	1	1	1	1	1	1	1	1			1
B											1
C											1
D											1
1	-1				-1						-1
2		-1				-1					-1
3			-1				-1				-1
4				-1				-1		-1	-1

Figure 4.15 MATCHING NETWORK FOR INDUSTRIAL PLANT LOCATION

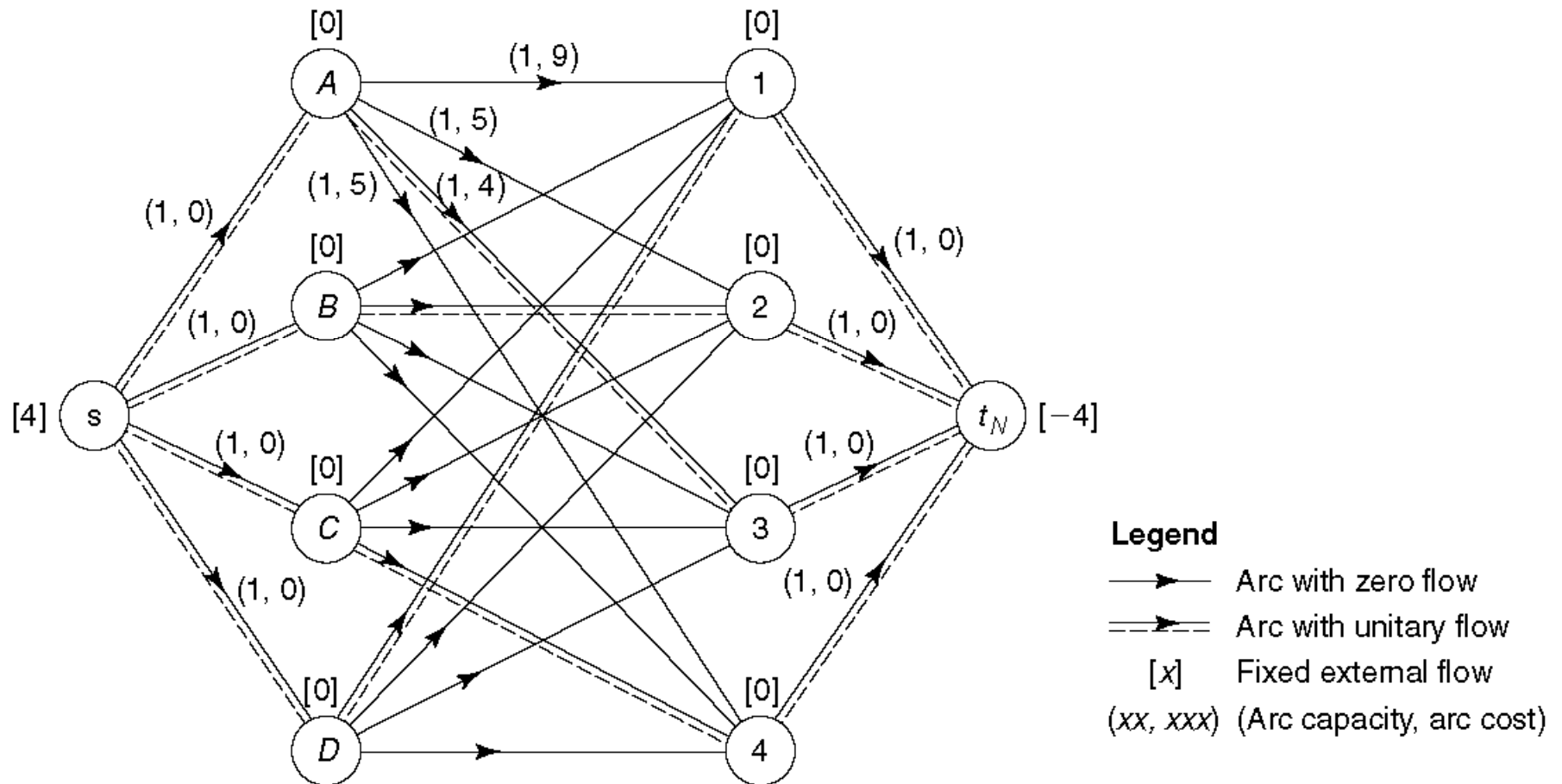


Figure 4.16 NETWORK WITH GAIN MODEL OF PRODUCT ALLOCATION

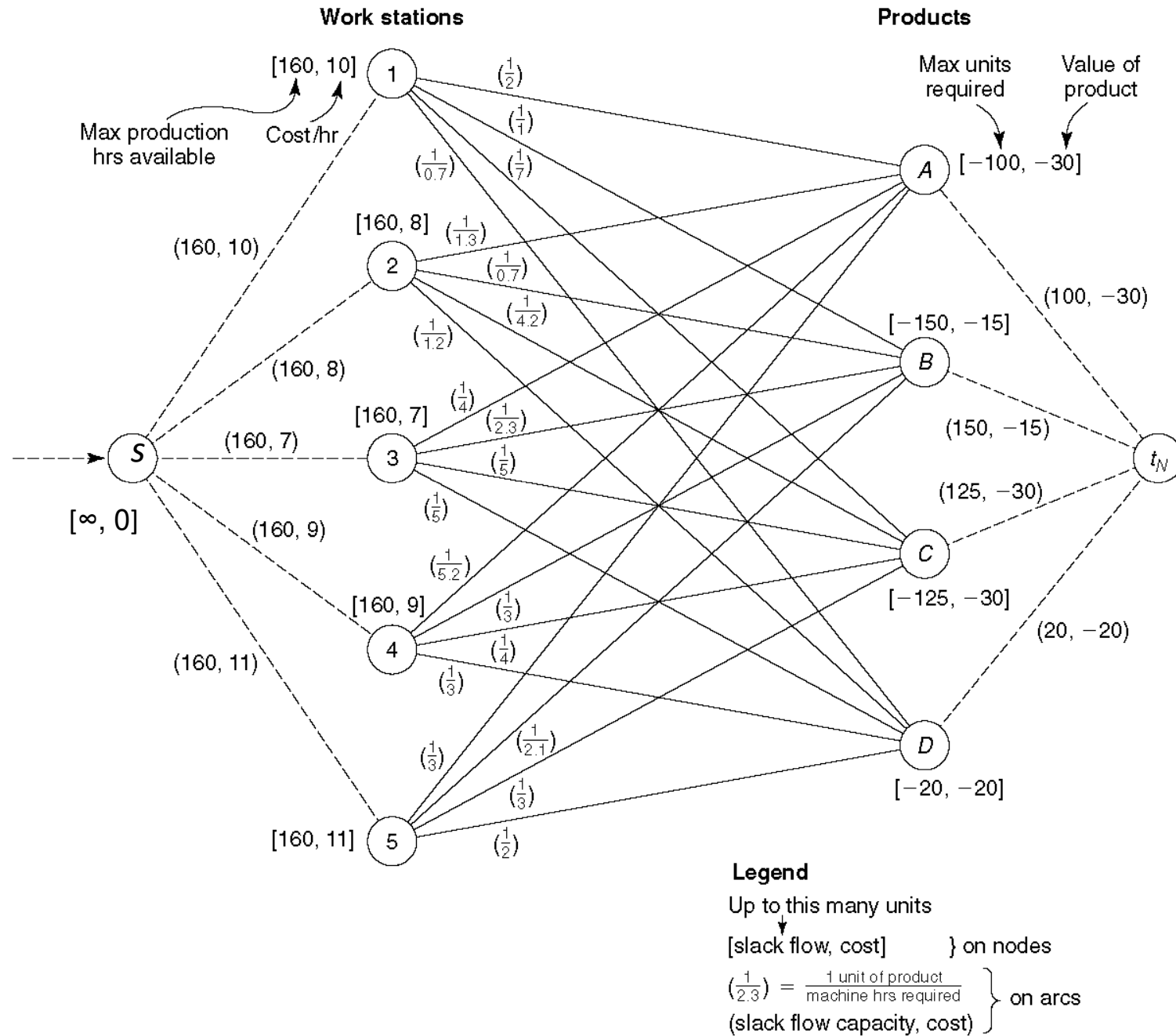


Figure 4.17 LOCATION CONFIGURATION FOR WORK-STATIONS

