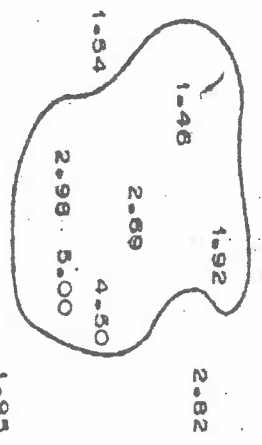
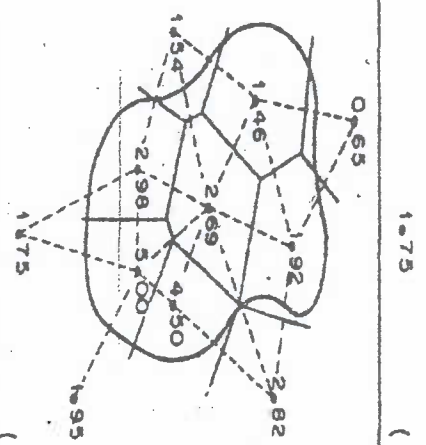


# 4. MEAN RAINFALL OVER AN AREA



Arithmetic mean:

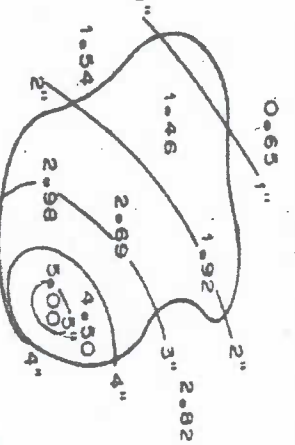
$$\frac{1.46 + 1.92 + 2.69 + 4.50 + 2.98 + 5.00}{6} = 3.09 \text{ in.}$$



Thiessen method:

Observed precip. (in.)	Area* (sq. mi.)	Per cent total area	Weighted precipitation (in.) (col. 1 x col. 3)
0.65	7	1	0.01
1.46	120	18	0.28
1.92	109	16	0.35
2.69	120	19	0.51
1.54	20	3	0.05
2.98	92	15	0.45
5.00	82	13	0.65
4.50	76	12	0.54
	626	100	2.84

Average = 2.84 in.  
\* Area of corresponding polygon within basin boundary

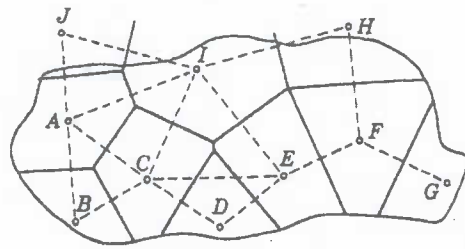


Isohyetal method:

Isohyet (in.)	Area* enclosed (sq. mi.)	Net area (sq. mi.)	Avg. precip. (in.)	Precipitation volume (col. 3 x col. 4)
5	13	13	5.3	69
4	90	77	4.6	354
3	206	116	3.5	406
2	402	196	2.5	490
1	595	195	1.5	290
< 1	626	51	0.8	25
				1634

Average = 1634 ÷ 626 = 2.61 in.  
\* Within basin boundary

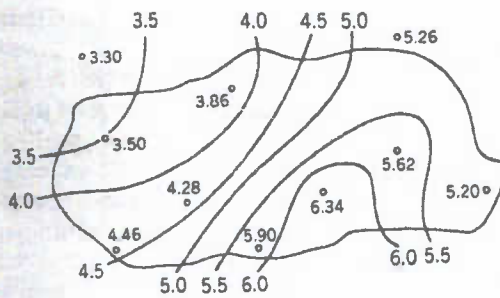
Figure 3-11 Areal averaging of precipitation by (a) arithmetic method, (b) Thiessen method, and (c) isohyetal method.



Station	Thiessen area mi <sup>2</sup>	Precipitation, in.	Product, mi <sup>2</sup> in.
A	72	3.50	252
B	34	4.46	152
C	76	4.28	325
D	40	5.90	236
E	76	6.34	482
F	92	5.62	517
G	46	5.20	239
H	40	5.26	211
I	86	3.86	332
J	6	3.30	20
Total	568	47.72	2766

$$\text{Average precipitation} = \frac{\sum \text{Product}}{\sum \text{Area}} = \frac{2766}{568} = 4.87 \text{ in.}$$

FIGURE 2.3  
Thiessen network.



$$\text{Average precipitation} = \frac{\sum AP}{\sum A} = \frac{2745}{568} = 4.83 \text{ in.}$$

Isohyets	Area between isohyets, mi <sup>2</sup>	Average precipitation, in.	Product A x P, mi <sup>2</sup> in.
3.0	19	3.45	66
3.5	106	3.75	398
4.0	102	4.25	434
4.5	60	4.75	285
5.0	150	5.25	788
5.5	84	5.75	483
6.0	47	6.20	291
6.5			
Total	568	—	2745

FIGURE 2.4  
An isohyetal map.