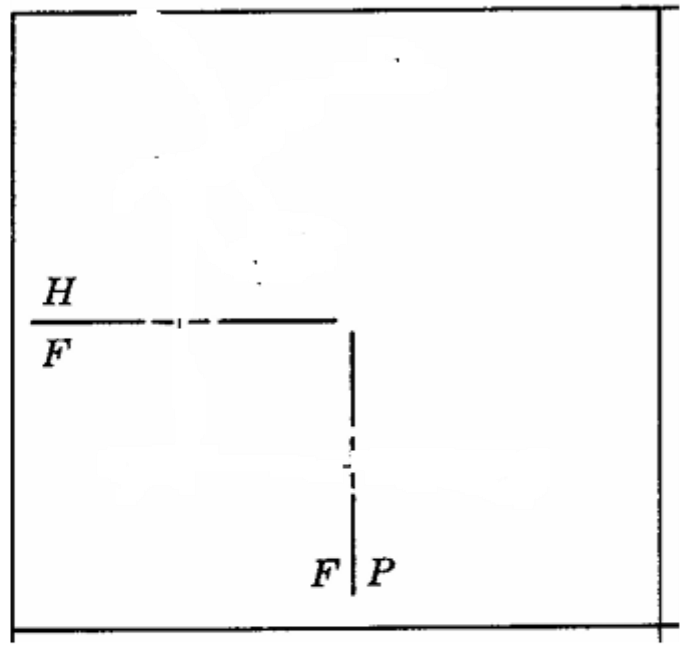
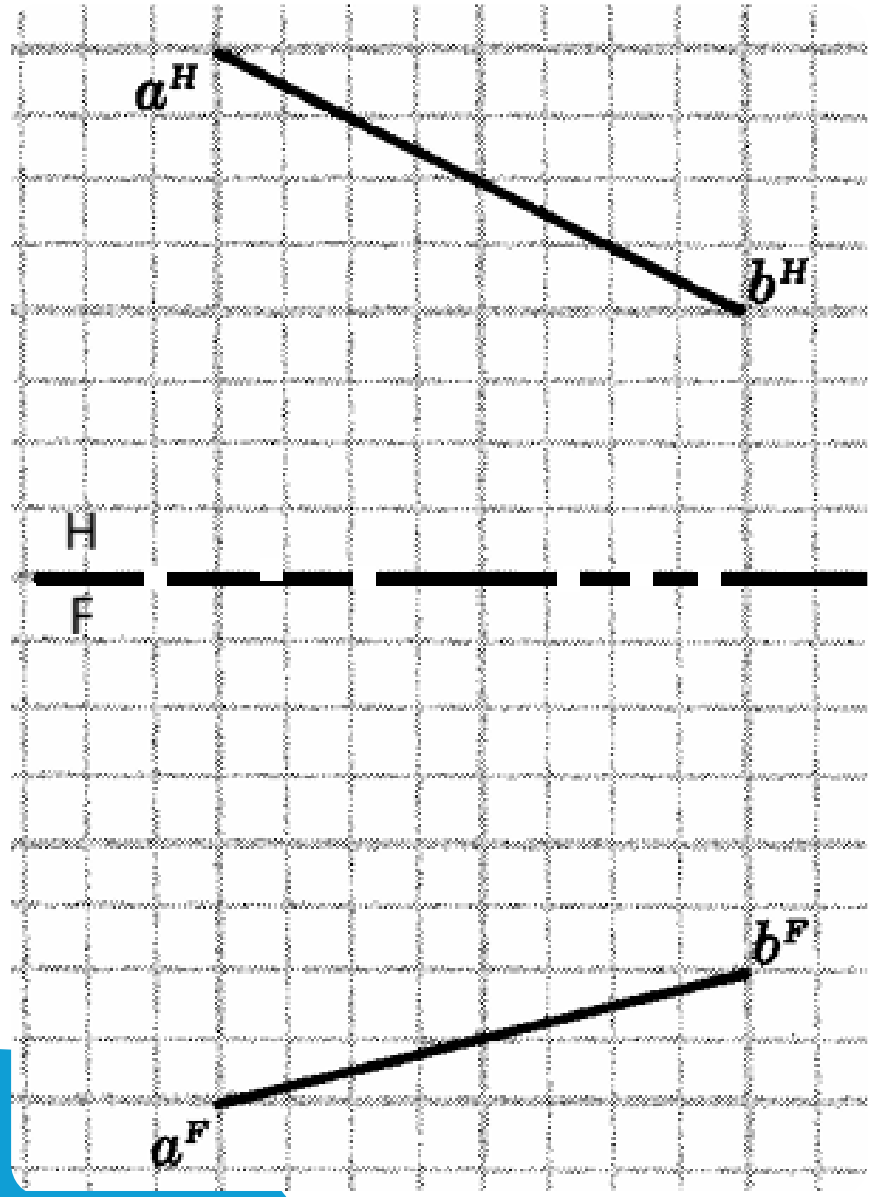
NGINEERING DRAWING LECTURE 8

NOTATIONS

As noticed in fig.
, the intersection of the horizon tal and frontal image planes is designed by placing the letter H on the side which shows the plan view, and the letter F is placed on the side which gives us the front view. Similarly, the intersection of the plan and profile views is designated by placing the letter H on the plan side of the reference line and the letter P is located on the profile side of the intersection. Designed





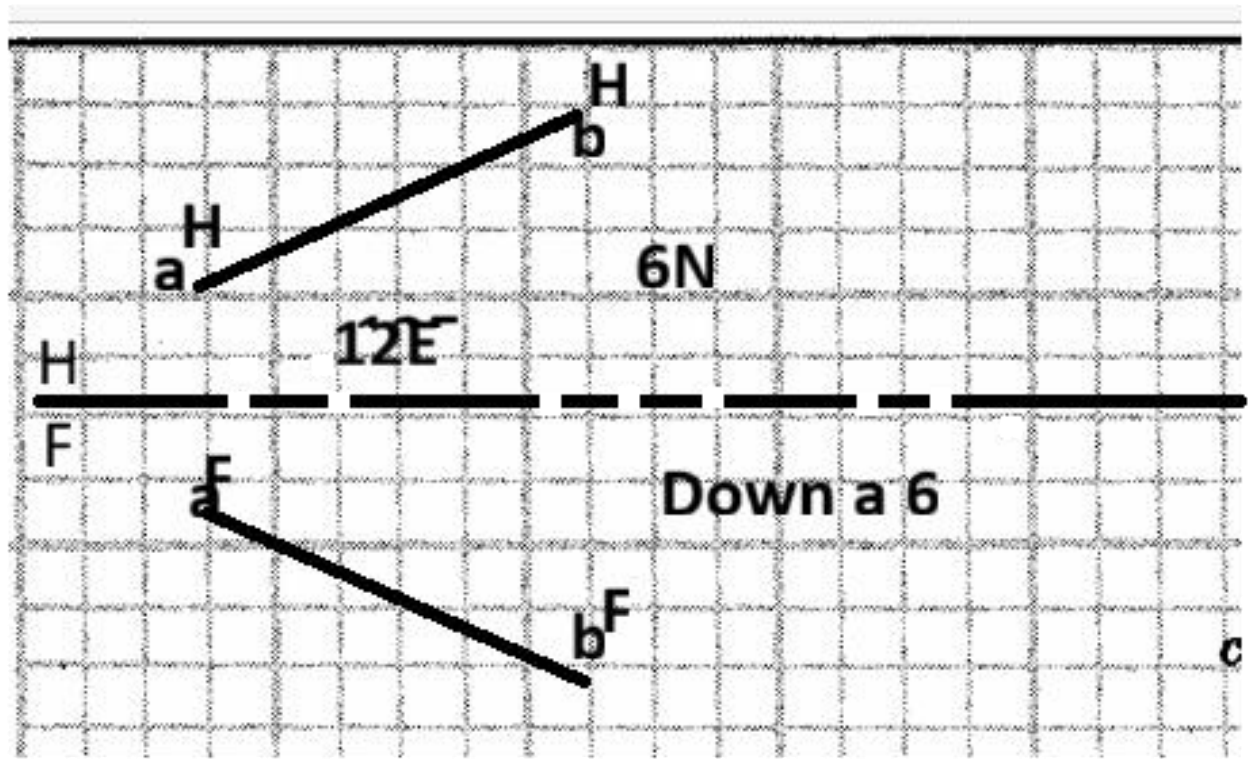
1- coordinates System:

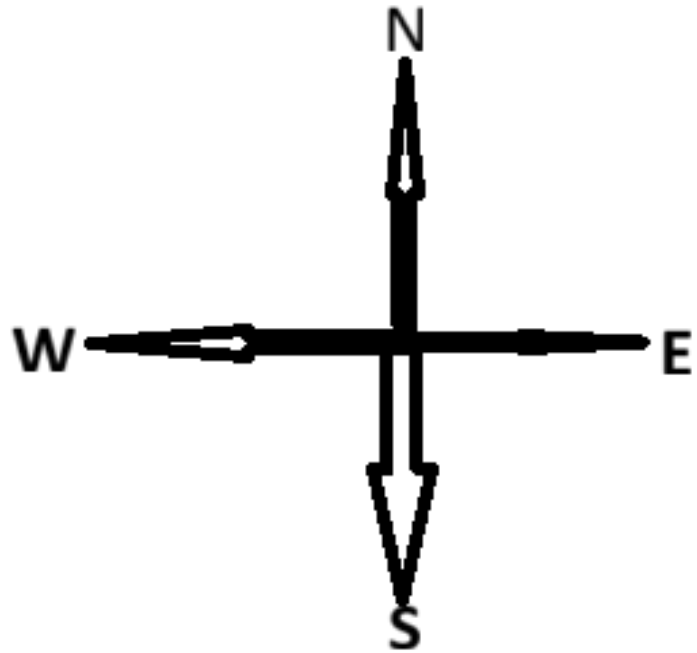
For the line AB

A (x , y ,z) . X from left to right , y downwords from folding line , z upwords from folding line.

A (1.5,4,4)

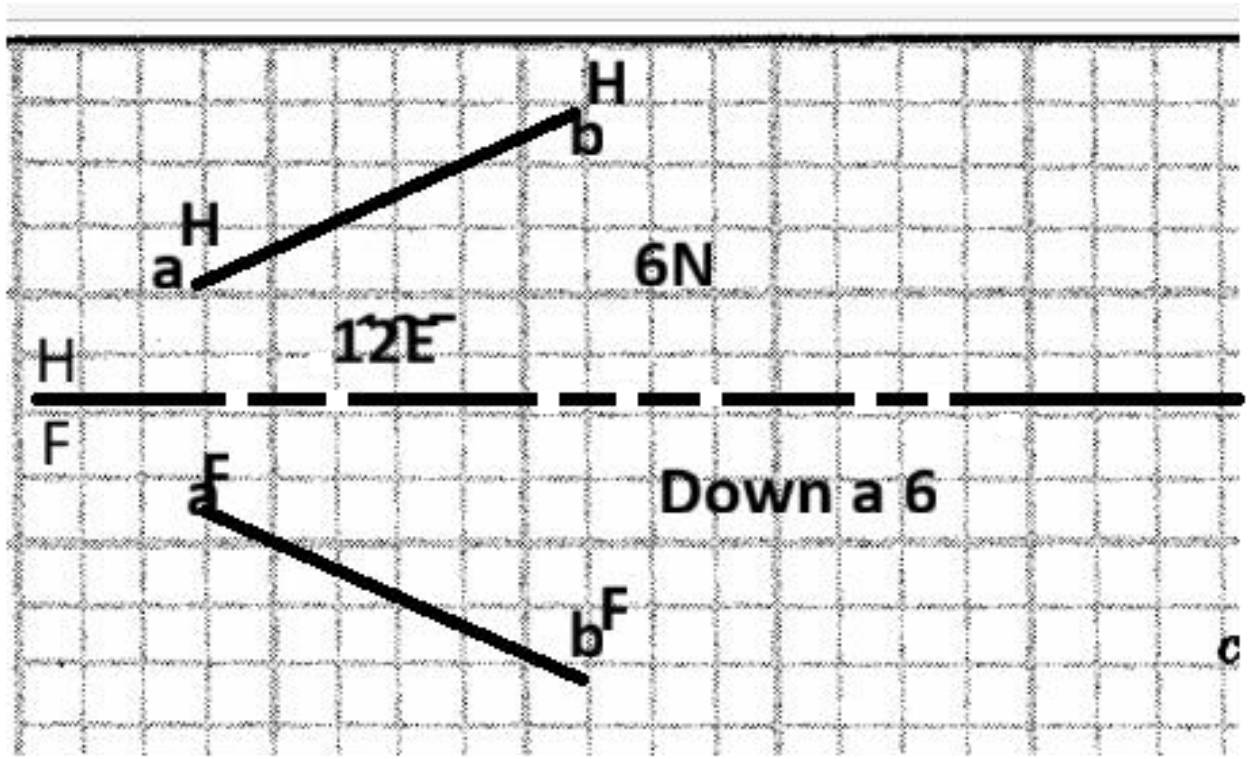
B (5.5,3, 2)

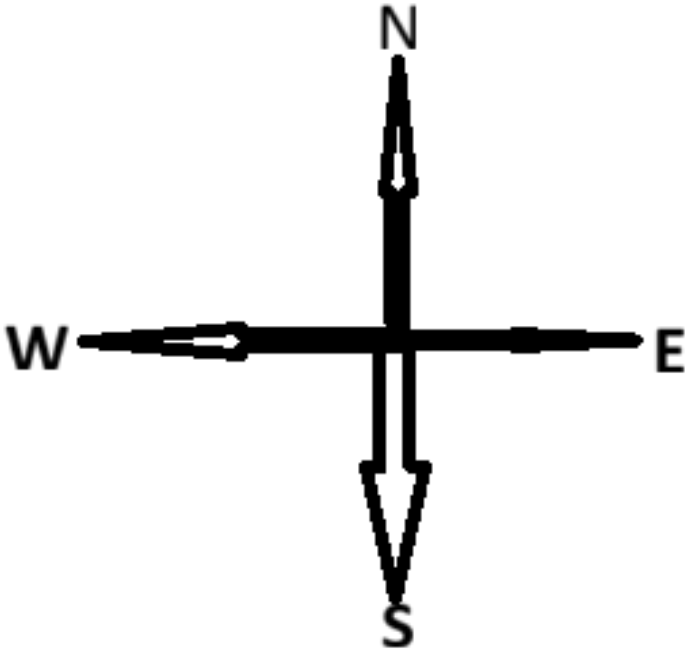

H
b
H
a
6N
12E
H
F
F
a
Down a 6
b F
c


N
W
E
S

2- direction and elevation:

Point b is 12E, 6N and below(a) by 6





3- Bearing method :

1- At horizontal plan to give tha direction of (a) from (b)

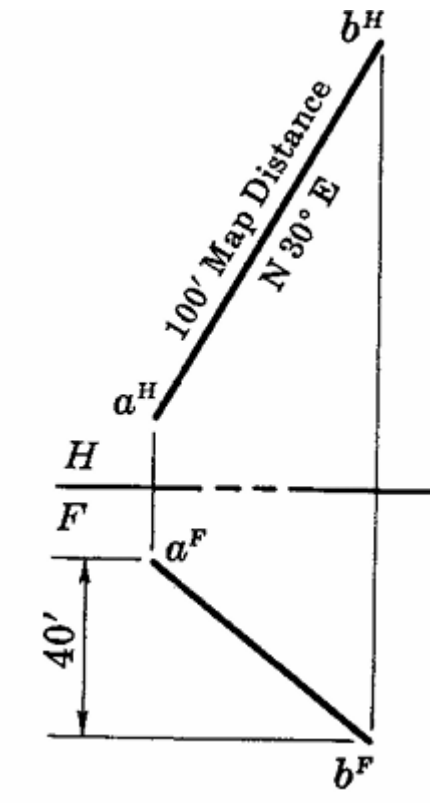
And the map distance .

2- at frontal plan togive the elevation of (b) related to (a)

e.G below (a) , above (a) or leveled with (a).

The example shows point (b) is North 30° East and 100´map distance

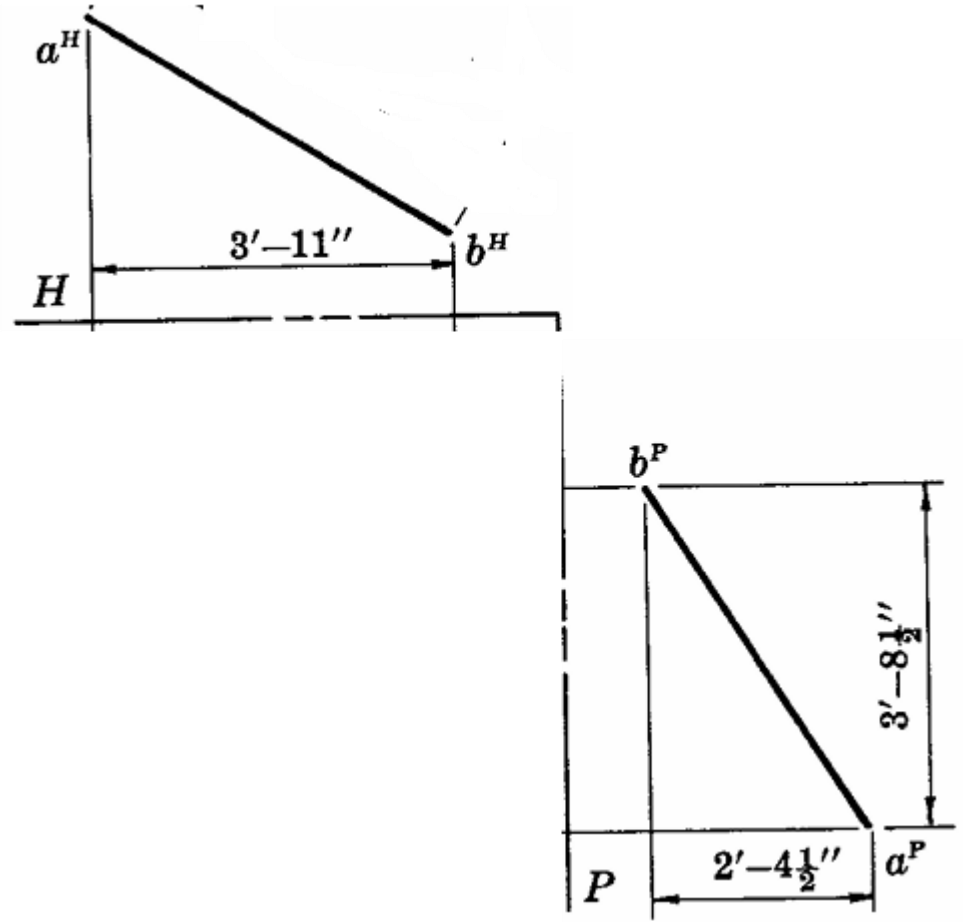
And below (a) by 40´ from (a).



Solved problems:

Given: Plan and profile views of the line AB in Fig..

Problem: Determine the true length and slope of the line AB



From both the plan and profile views
Project line AB into the front view. Draw an auxiliary elevation view
with the folding line B-1 parallel to the
plan view of the line. View 1 will show Both the true length and slope of the line AB. (Scale: i" = 1’-0”).

Ans. T.L. = 5'-11", Slope = 39°

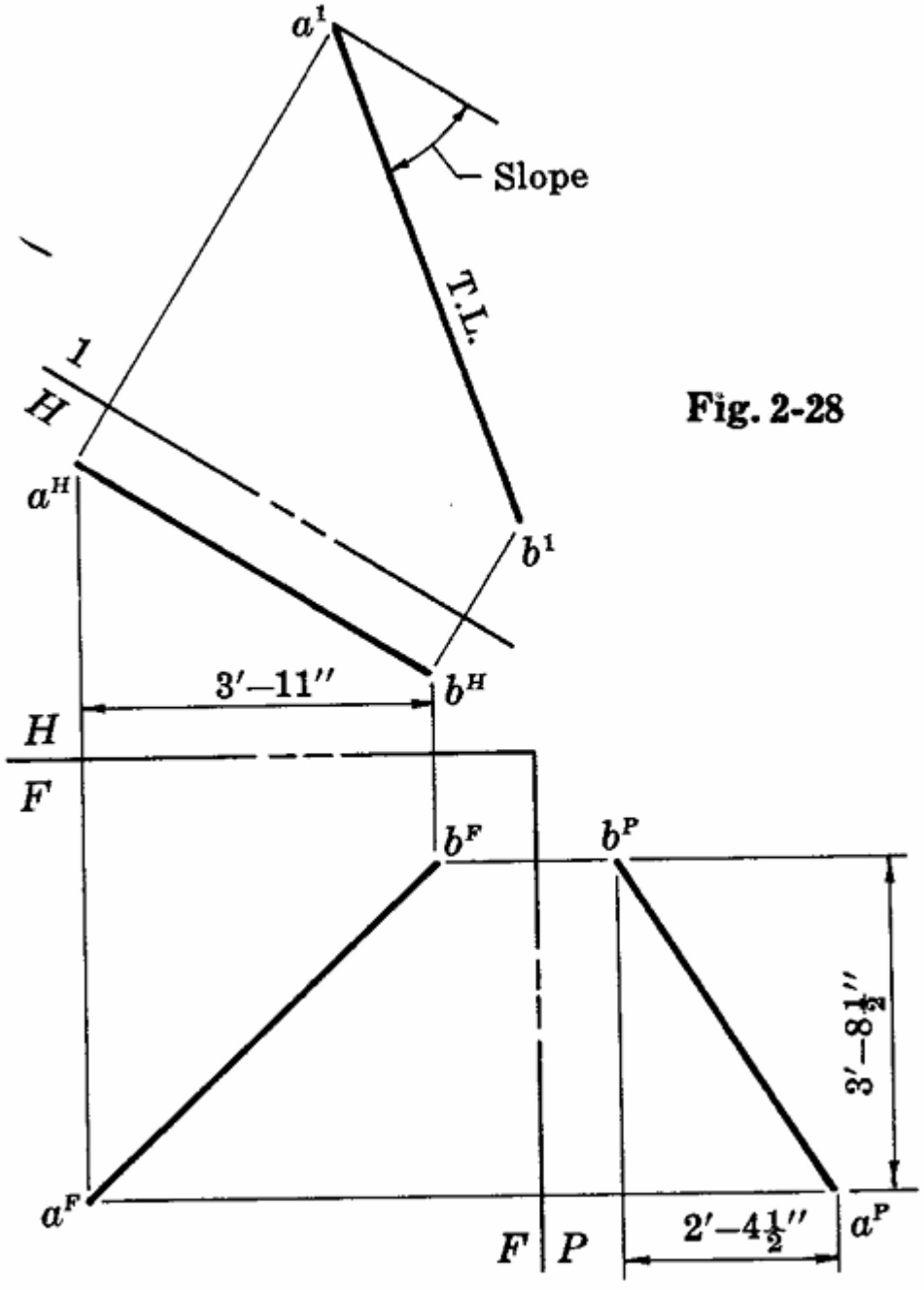


Fig. 2-28

Given: Plane ABC in Fig. 2-30 below. Point B is 4' east, 2' south of A and 6' below A. Point C is 7' east, 3' north of A and 2' above A. Point X on the plane is 2' east, l' south of A and 3' below A. Scale: 1/8 = 1'-0".

<u>Problem:</u>

What is the bearing of a level line passing through point X?

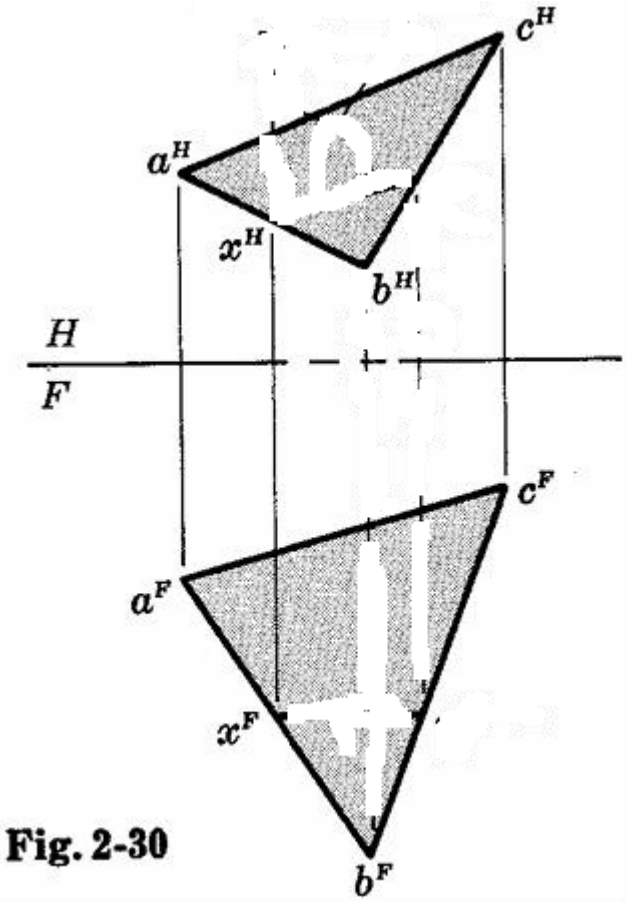


Fig. 2-30

Solution:

Draw the plan and front elevation views of plane ABC and point X. Draw a level

Line through point X in the front view until it intersects line BC. Label the intersection point Y and project it

up to the plan view. Measure the bearing of line XY in the plan view.

Ans. Bearing XY = N 73° E

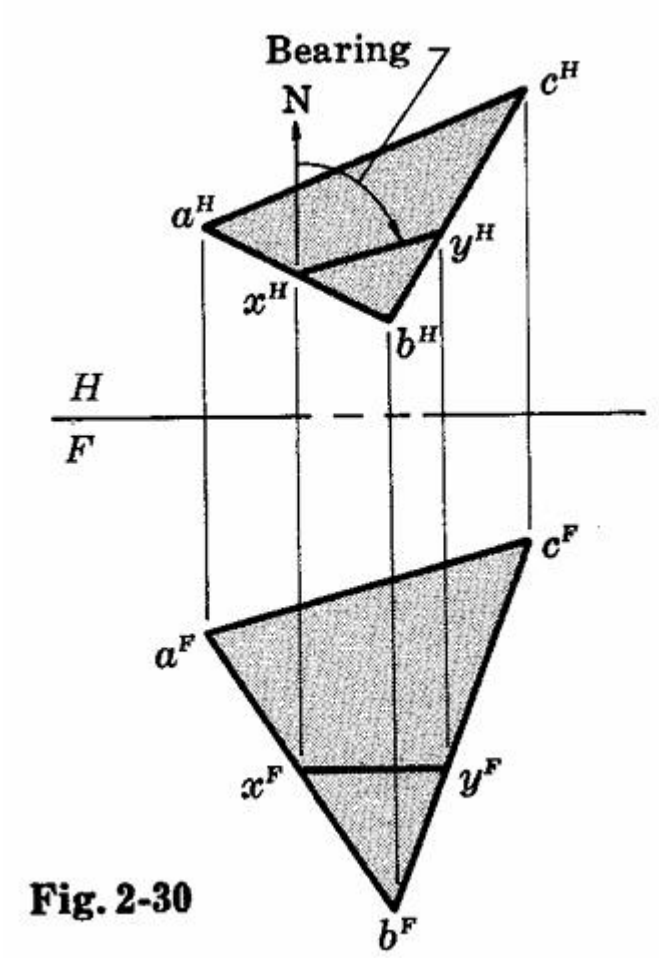
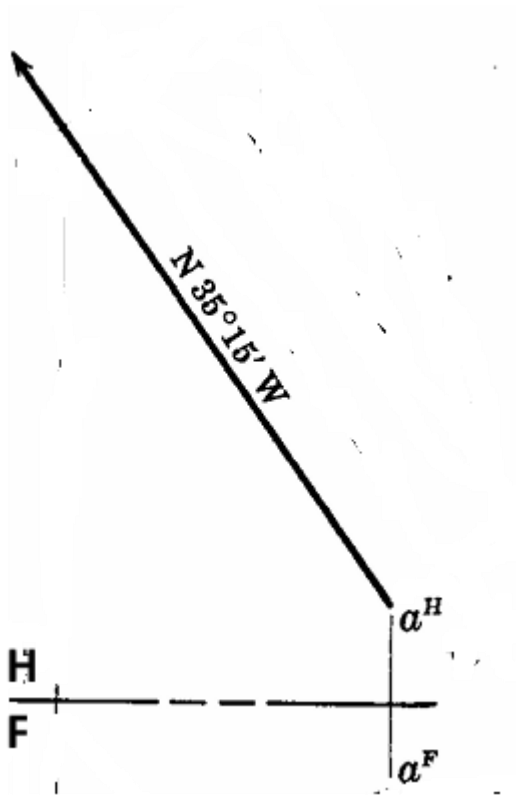


Fig. 2-30

Given: A tunnel at the bottom of a vertical shaft bears N 35°15' W. The tunnel has a downward grade of 20% and is 12S' long. Scale: 1" = 8O'.

Problem: How would the tunnel appear in the plan and front elevation views? What is the difference in elevation between the two ends of the tunnel?



Solution:

1- Locate point A in both the plan and front elevation views. See Fig. 2-31 below

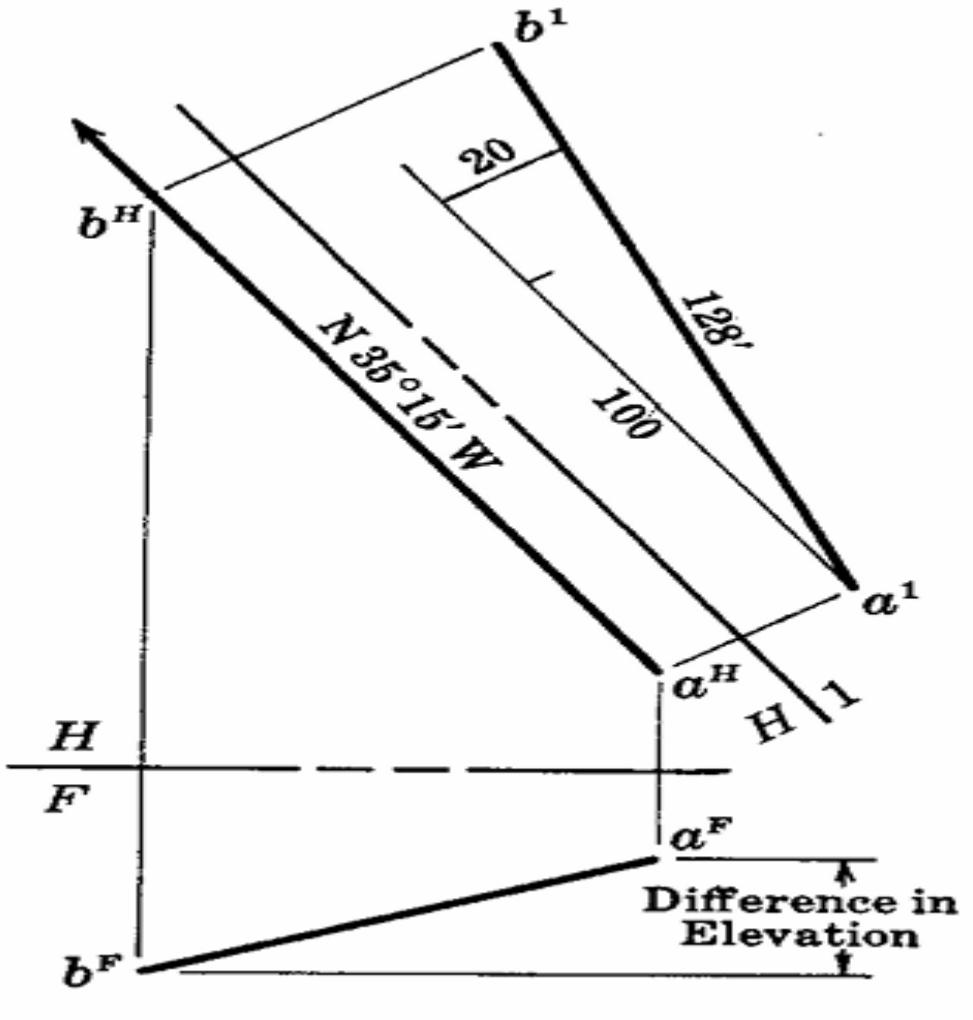
2- From point (a) in the plan view, draw a line of indefinite length having a bearing of N 35°15' W.

3- Draw auxiliary elevation view 1 to show the true length and grade of the tunnel from A. Label the lower end of the tunnel point (b)

4- project it back to the plan and front views.
5- The vertical distance between the ends of the tunnel can be measured in either

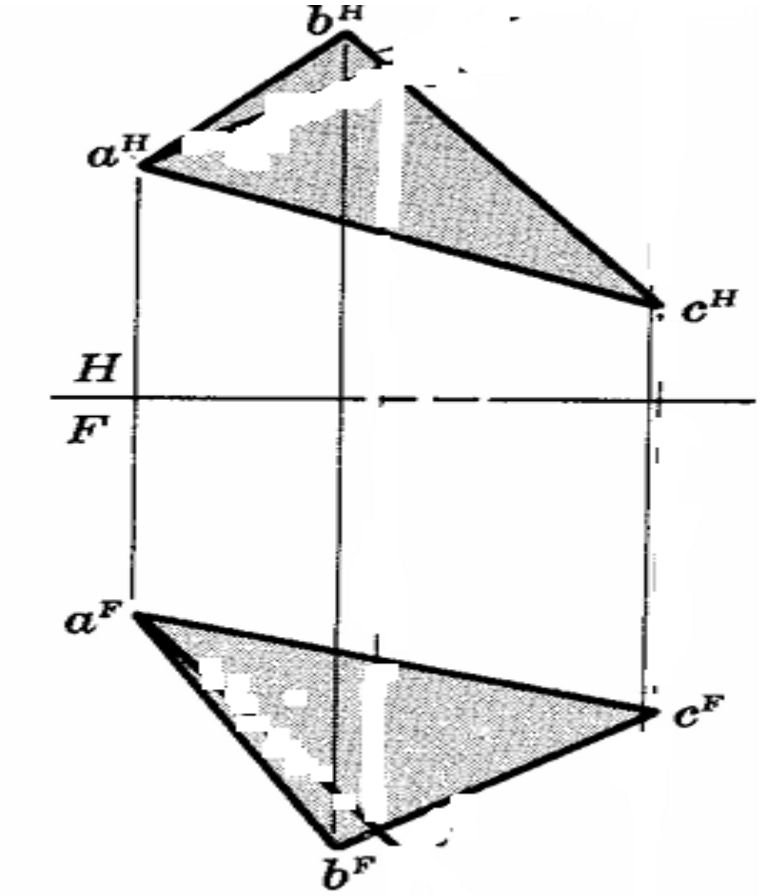
the front view or auxiliary elevation view 1.

Ans. Difference in Elevation = 25'



Given: Plane ABC in Fig. 2-32 above. Point B is 3' east, 3' north of A and 5' below A. Point C is S' east, 3' south of A and 2' below A. Point X in plane ABC has a map distance of 9' away from A and bearing N 60° E from A. Scale: i" = 1'-0".

Problem: Locate point X in the front elevation view.



Solution:

1- Using the given data,

Draw the plan and front elevation views of plane ABC.

2- From point A in the plan view, draw a line having a bearing of N 60° E and having a plan view length of 9'.

3- Label the intersection of line AX with BC as point D.

4- Locate point D in the front view.

5- Draw a line from point A in the front view through point D until it meets the projection of X from the plan view.

6- This intersection will establish the front view of point X.

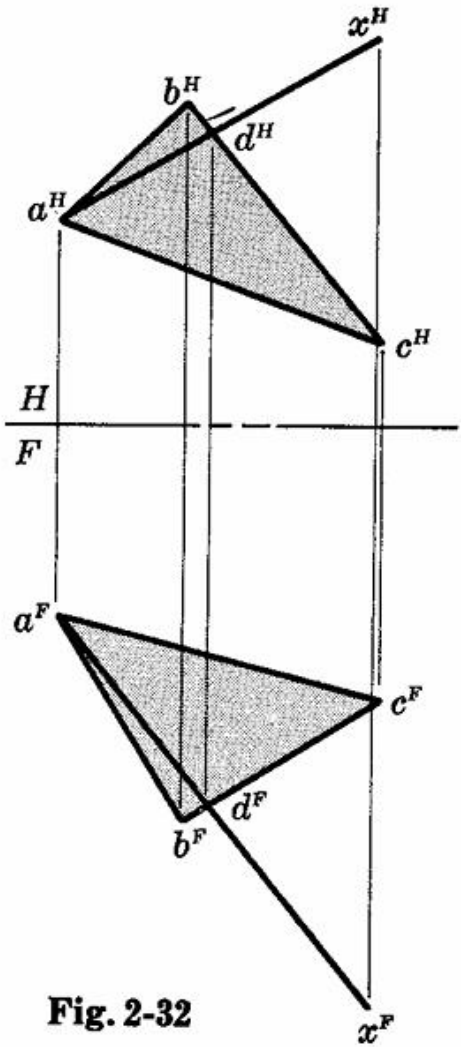
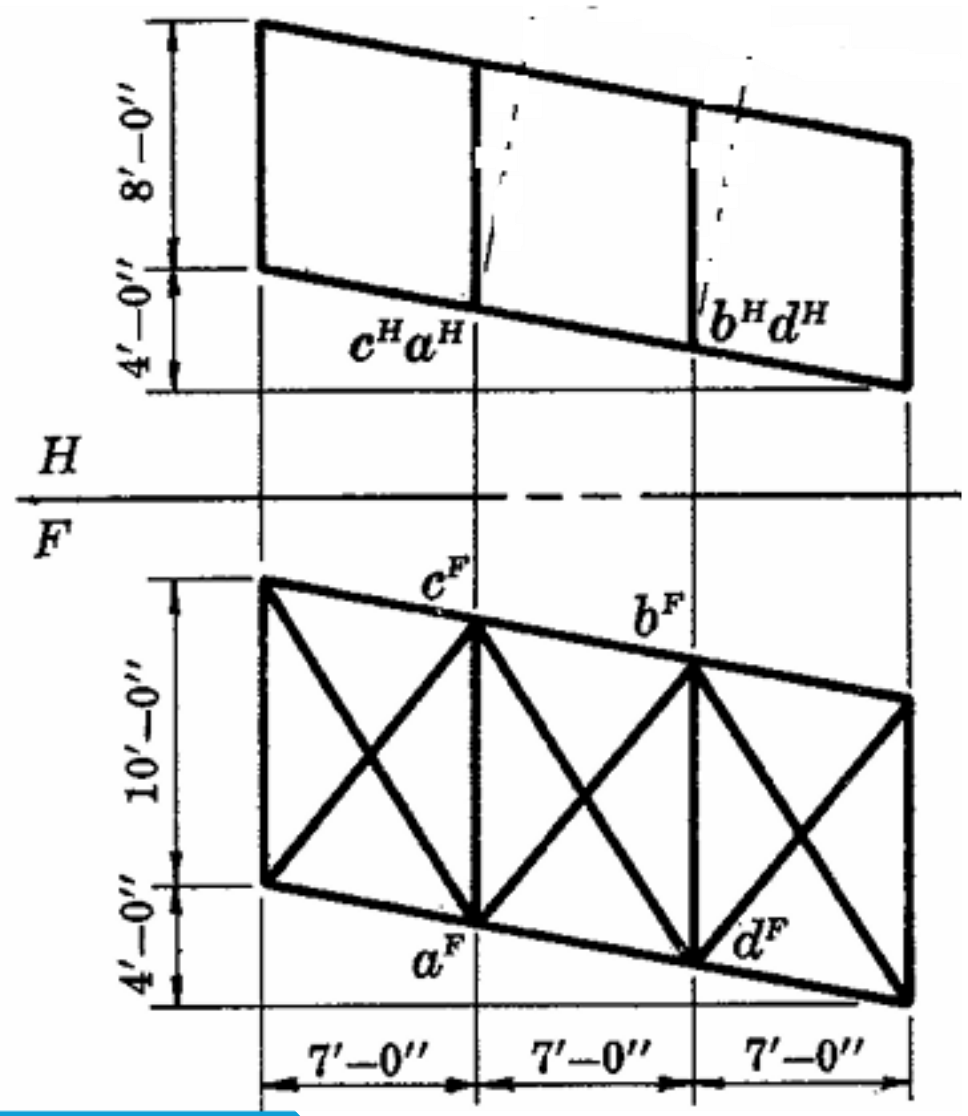


Fig. 2-32



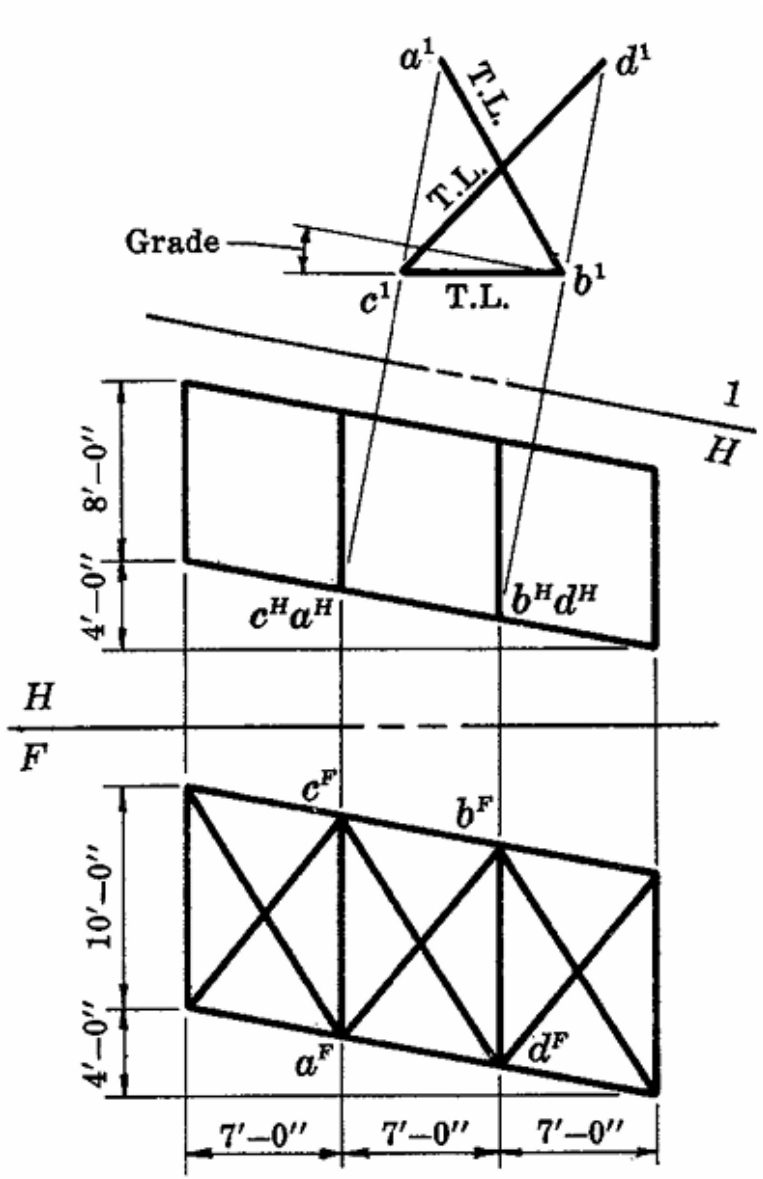
Given: Fig. shows the structural framework

between two adjacent buildings. Scale:h" = 1'-0".

Problem: Determine the true length of structural

members AB and CD. What is the true length and

per cent grade of member Be?



Solution:

1- Place a folding line H-I parallel to the plan view of CABD.

.2- Project to obtain an auxiliary elevation view.

3- This auxiliary elevation view will yield

The true length and grade as required.

Ans. T.L.: AB = 11'-3", CD = 13'-3", BC = 7’-2 2 1/ 2".

Grade BC = 18%

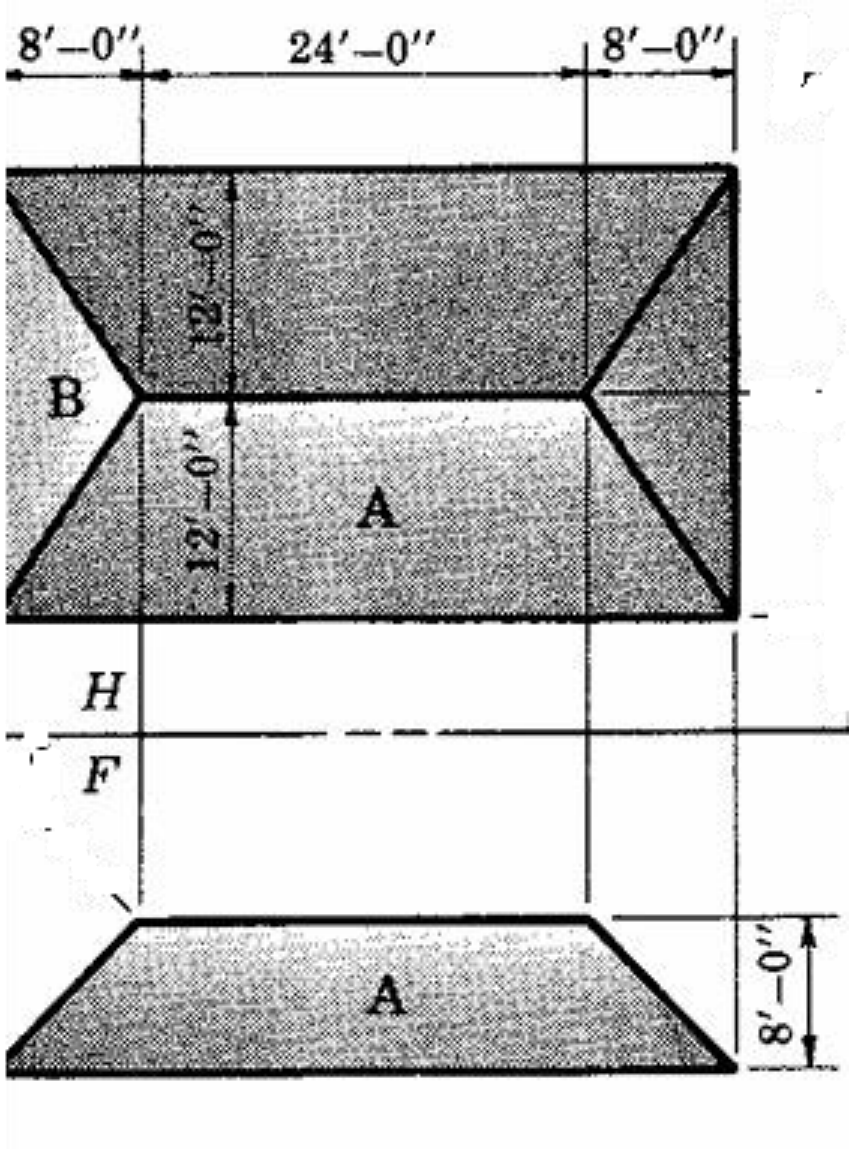
Given: A hip roof which must be covered with zinc sheets as shown in

Figure. Scale: 1" = 30'.

Problem: Show the true size of planes A and B.

How many "squares" of sheets will be required

to cover the roof? (1 Square = 100 Sq. Ft.)



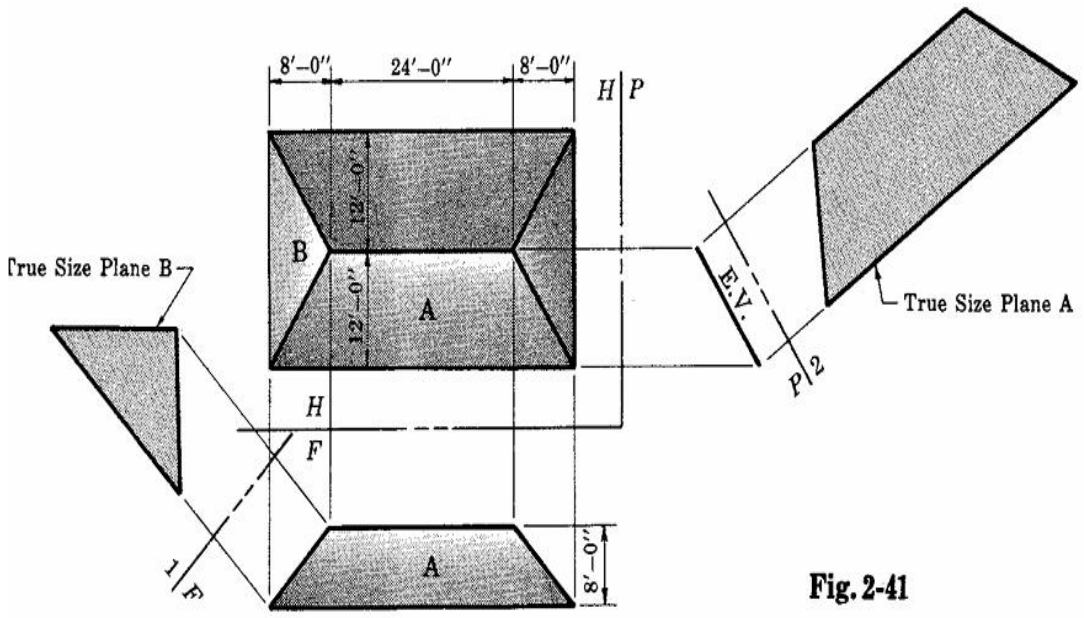


Fig. 2-41

Solution:

1- Since plane B is shown as an edge in the front Elevation view,

2- a folding line F-1 is placed parallel to this edge view. to obtain an inclined view which will show the true size of plane B.

3- Place a folding line F-P or H-P perpendicular to folding line H-F To obtain an edge view of plane A.

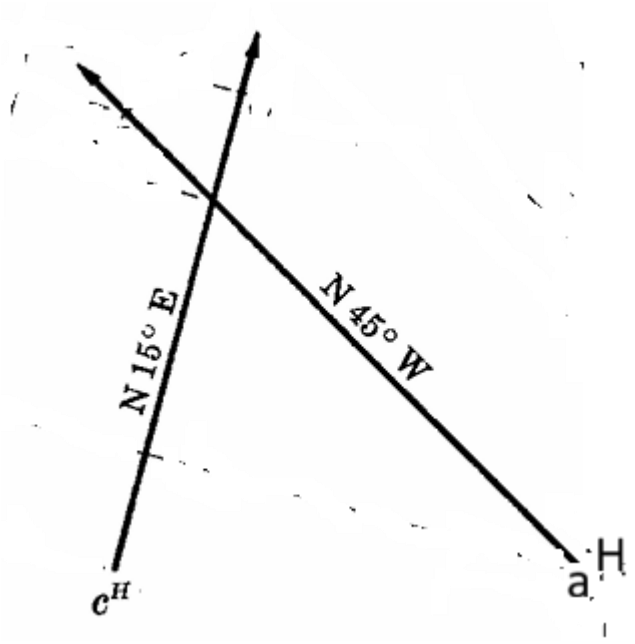
4- Place a folding line parallel to the edge view of plane A and project to obtain the true size of plane A .

5- Calculate the area of planes A and B, then multiply by two since there are two of each size planes.

Ans. 12 Squares

Given: AB and CD are the centerlines of two conveyor ducts having circular cross sections. One duct bears N 45° W from A, is 75' long, and has a slope from A of -20°. Point C, which is located 50' due west of A and at the same elevation as A, is the beginning of a duct bearing N 15° E, which is 55' long and has a slope of -15° from C. Both ducts have a diameter of 3'-0". See Fig. 2-42 below. Scale: 1" = 40'.

Problem: What is the vertical clearance between the two ducts?



Solution:

1- Locate the points A and C in the plan view.

2- Draw lines of indefinite .length from both A and C

having the given bearings.

3- Draw auxiliary elevation view 1 to determine the end of the duct which begins at A.

4- Label this point B and project it to the plan view.

5- Draw auxiliary elevation view 2

in order to show the true length and slope of the duct from C.

6- Label the other end of the duct, point D.

7- Project points A and B from the plan view into auxiliary elevation view 2.

8- The intersection of the bearing lines in the plan view will determine the vertical distance, or clearance, in elevation 2.

Ans. 6'-6"