## IE 111 Computer Aided Engineering Drawing

Orthographic Projection - Projection of Third Principal View from the Other Two Principal Views Auxiliary Views

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## Multiview Drawings

The six principal views of an object


## Multiview Drawings



## Multiview Drawings



## Alignment of the Views




VIEW A


VIEW C


VIEW B


VIEW D
DMV2Ch0627


## Orthographic Drawing - Alignment of the Views

- An example of orthographic drawing


Note that the views are aligned. This is required in order to represent the relation between the views.

## Visualizing Solids and Multiview Drawings



## Techniques to Visualize Geometry of an Object

- Projection Studies
- Physical Model Construction
- Adjacent Areas
- Similar Shapes
- Surface Labeling
- Missing Lines
- Vertex Labeling
- Analysis by Solids
- Analysis by Surfaces


## Auxiliary Views

Auxiliary views are used to determine the true size and shape of features that would appear foreshortened in any of the principal views.


(B)

An auxiliary view of an inclined plane is not one of the principal views.

## Auxiliary Views



Object in glass box and resulting six views when the box is unfolded.

## Auxiliary Views



Object in glass box with special auxiliary plane.


Unfolding the glass box to create an auxiliary view of the inclined plane.

## Auxiliary Views



## Object Distance From Fold Line

Unfolding the glass box to create an auxiliary view of the inclined plane.

## Auxiliary View Classification

Primary Auxiliary View:
Projected from principal views.
Secondary Auxiliary View : Projected from primary auxiliary view.
Tertiary Auxiliary View : Projected from secondary auxiliary view.


## Primary, Secondary, and Tertiary Auxiliary Views

The line of sight determines the direction of the projection lines used in each auxiliary view.

## Depth Auxiliary View

Constructing a depth auxiliary view to determine the true size and shape of the inclined surface.


Step 1


Step 2


Step 5
Step 6

## Height Auxiliary View



Step 1


Step 4


Step 2


Step 5


Step 3


Step 6

## Full/Partial Auxiliary Views

A full auxialiary view, including hidden lines, and a partial auxiliary view with no hidden lines.


## Full/Partial Auxiliary Views

A half auxialiary view of a symmetrical feature.


## Full/Partial Auxiliary Views

Constructing a curve in an auxialiary view.


## Auxiliary View Application Areas

$\square$ Reverse construction
$\square$ True length of a line
$\square$ Point view of a line
$\square$ Edge view of a plane
$\square$ True size of a plane

## Auxiliary View Application Areas

Reverse Construction Technique


## Auxiliary View Application Areas

Point View of a Line



Step 4

## Auxiliary View Application Areas

True Measurement of a Dihedral Angle


Step 1
Step 2

## Creative Successive Auxiliary Views



The blue arrows surrounding the primary view indicate a few of the possible lines of sight that can be used to generate successive views.

## Creative Successive Auxiliary Views



Step 1


Constructing successive auxiliary views to determine the true size of an oblique surface.

Missing Line Exercise 5_1
Complete the missing lines

## Top view




Front view


Right hand view

## Missing Line Exercise 5_1



## Missing Line Exercise 5_2


(1) Missing Line Exercise 5_2


## Missing Line Exercise 5_3


(D) Missing Line Exercise 5_3


## Missing Line Exercise 5_4



## Missing Line Exercise 5_4



Missing Line Exercise 5_5


## Missing Line Exercise 5_5



## Missing Line Exercise 5_6

## Complete the missing lines



## Missing Line Exercise 5_6



## Missing Line Exercise 5_7



## Missing Line Exercise 5_7



## (1) Missing Line Exercise 5_8

Complete the missing lines


## Missing Line Exercise 5_8



## Missing Line Exercise 5_9

Complete the missing lines


# Missing Line Exercise 5_9 



Complete the missing lines


## (1) Missing Line Exercise 5_10 <br> (4) Missing Line Exercise 5_10


fomplete the missing lines


## (2) Missing Line Exercise 5_11



## Missing Line Exercise 5_12

## Complete the missing lines



## Missing Line Exercise 5_12



Missing Line Exercise 5_13

## Complete the missing lines



## Missing Line Exercise 5_13



## Missing Line Exercise 5_14



## Missing Line Exercise 5_14



Missing Line Exercise 5_15


Complete the missing lines


Missing Line Exercise 5_15


## Missing Line Exercise 5_16

## Complete the missing lines



16


## (0) Missing Line Exercise 5_16



## Missing Line Exercise 5_17



## Complete the missing lines



Missing Line Exercise 5_17


## Missing Line Exercise 5_18

## Complete the missing lines



## Missing Line Exercise 5_18



## Missing Line Exercise 5_19

## Complete the missing lines



## Missing Line Exercise 5_19



## Missing Line Exercise 5_20



Complete the missing lines


## Missing Line Exercise 5_20



## Missing Line Exercise 5_21



## Complete the missing lines



## (0) Missing Line Exercise 5_21



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## Missing Line Exercise 5_22



## Missing Line Exercise 5_22





Missing Line Exercise 5_23
Complete the missing lines


Missing Line Exercise 5_23


## Missing Line Exercise 5_24



## Complete the missing lines



## Missing Line Exercise 5_24



## Missing View Exercise 5_1

Complete the missing view

(0) Missing View Exercise 5_1


Complete the missing view


## Missing View Exercise 5_2




## Complete the missing view



## (1) Missing View Exercise 5_3



Missing View Exercise 5_4


## Missing View Exercise 5_4



## Missing View Exercise 5_5



Complete the missing view


## Missing View Exercise 5_5



## Missing View Exercise 5_6



Complete the missing view


## Missing View Exercise 5_6



Complete the missing view


## Missing View Exercise 5_7



Missing View Exercise 5_8


Complete the missing view


## Missing View Exercise 5_8



## Missing View Exercise 5_9



Complete the missing view

(0) Missing View Exercise 5_9



## Complete the missing view


(D) Missing View Exercise 5_10



Complete the missing view


## Missing View Exercise 5_11




Complete the missing view


## Missing View Exercise 5_12



## Problem 5.3 (Figure 5.120)

Given the two views, sketch or draw using CAD the views, missing view, and then sketch the pictorial.

(1)

(4)

(2)

(5)

(3)

(6)

## Problem 5.3 (Figure 5.120)

Given the two views, sketch or draw using CAD the views, missing view, and then sketch the pictorial.

(13)

(16)

(14)

(17)

(15)

(18)

## Problem 5.4

Given the three incomplete views, sketch or draw using CAD the views, missing lines, and then sketch the pictorial.


## Problem 5.4

Given the three incomplete views, sketch or draw using CAD the views, missing lines, and then sketch the pictorial.


## Problems 6.1 (Figure 6.17)


(1)

(4)

(2)

(5)

(3)

(6)


Using instruments or CAD,sketch or draw the two given views and a partial auxiliary view of the inclined surfaces.

## Problems 6.2 (Figure 6.18)


(7)

(10)

(8)

(11)

(9)

(12)

Using instruments or CAD,sketch or draw the two given views and a complete or a partial auxiliary view of the inclined surfaces.

