

SESSION 8

INTERSECTION OF SOLIDS

INTERPENETRATION OF SOLIDS

WHEN ONE SOLID PENETRATES ANOTHER SOLID THEN THEIR SURFACES INTERSECT
AND
AT THE JUNCTION OF INTERSECTION A TYPICAL CURVE IS FORMED,
WHICH REMAINS COMMON TO BOTH SOLIDS.

THIS CURVE IS CALLED **CURVE OF INTERSECTION**
AND
IT IS A RESULT OF INTERPENETRATION OF SOLIDS.

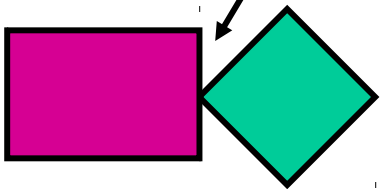
PURPOSE OF DRAWING THESE CURVES:-

WHEN TWO OBJECTS ARE TO BE JOINED TOGETHER, MAXIMUM SURFACE CONTACT BETWEEN BOTH BECOMES A BASIC REQUIREMENT FOR STRONGEST & LEAK-PROOF JOINT.
Curves of Intersections being common to both intersecting solids, show exact & maximum surface contact of both solids.

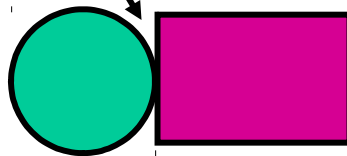
Study Following Illustrations Carefully.

Minimum Surface Contact.

(Point Contact)



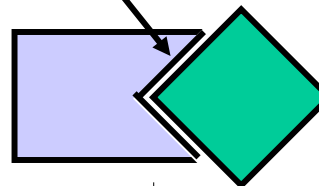
Square Pipes.



Circular Pipes.

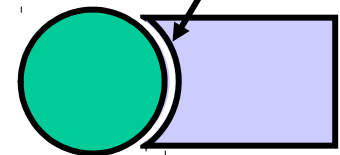
(Maximum Surface Contact)

Lines of Intersections.



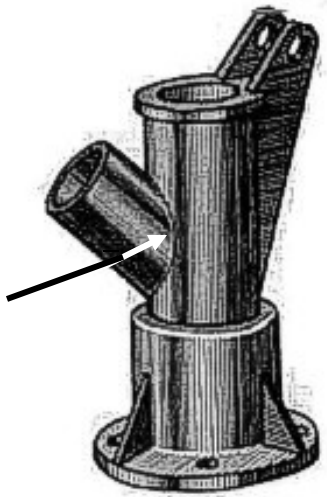
Square Pipes.

Curves of Intersections.

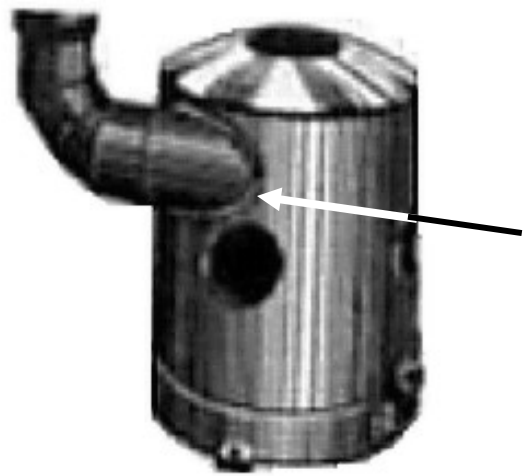


Circular Pipes.

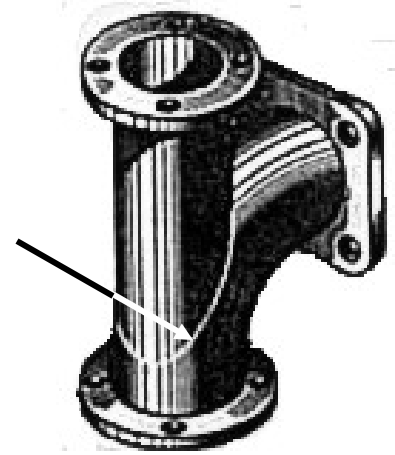
SOME ACTUAL OBJECTS ARE SHOWN, SHOWING CURVES OF INTERSECTIONS. BY WHITE ARROWS.



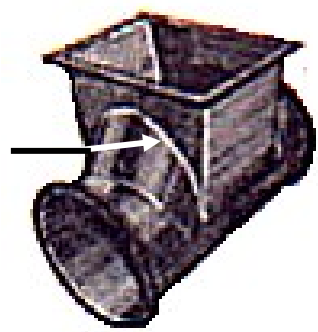
A machine component having two intersecting cylindrical surfaces with the axis at acute angle to each other.



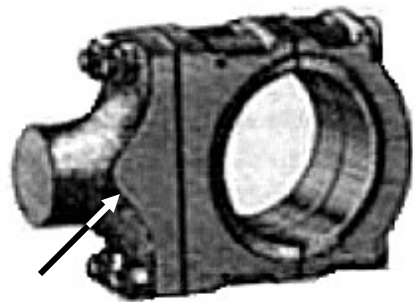
An Industrial Dust collector. Intersection of two cylinders.



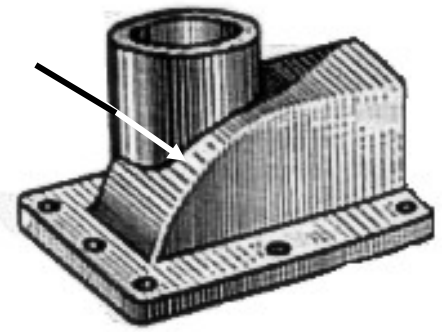
Intersection of a Cylindrical main and Branch Pipe.



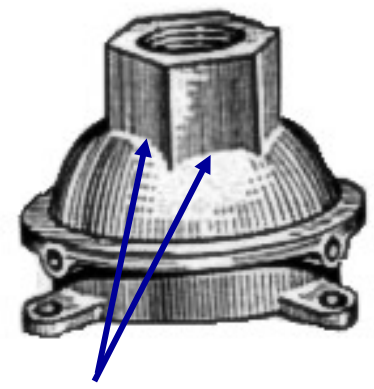
A Feeding Hopper In industry.



Forged End of a Connecting Rod.



Two Cylindrical surfaces.



Pump lid having shape of a hexagonal Prism and Hemi-sphere intersecting each other.

**FOLLOWING CASES ARE SOLVED.
REFER ILLUSTRATIONS
AND
NOTE THE COMMON
CONSTRUCTION
FOR ALL**



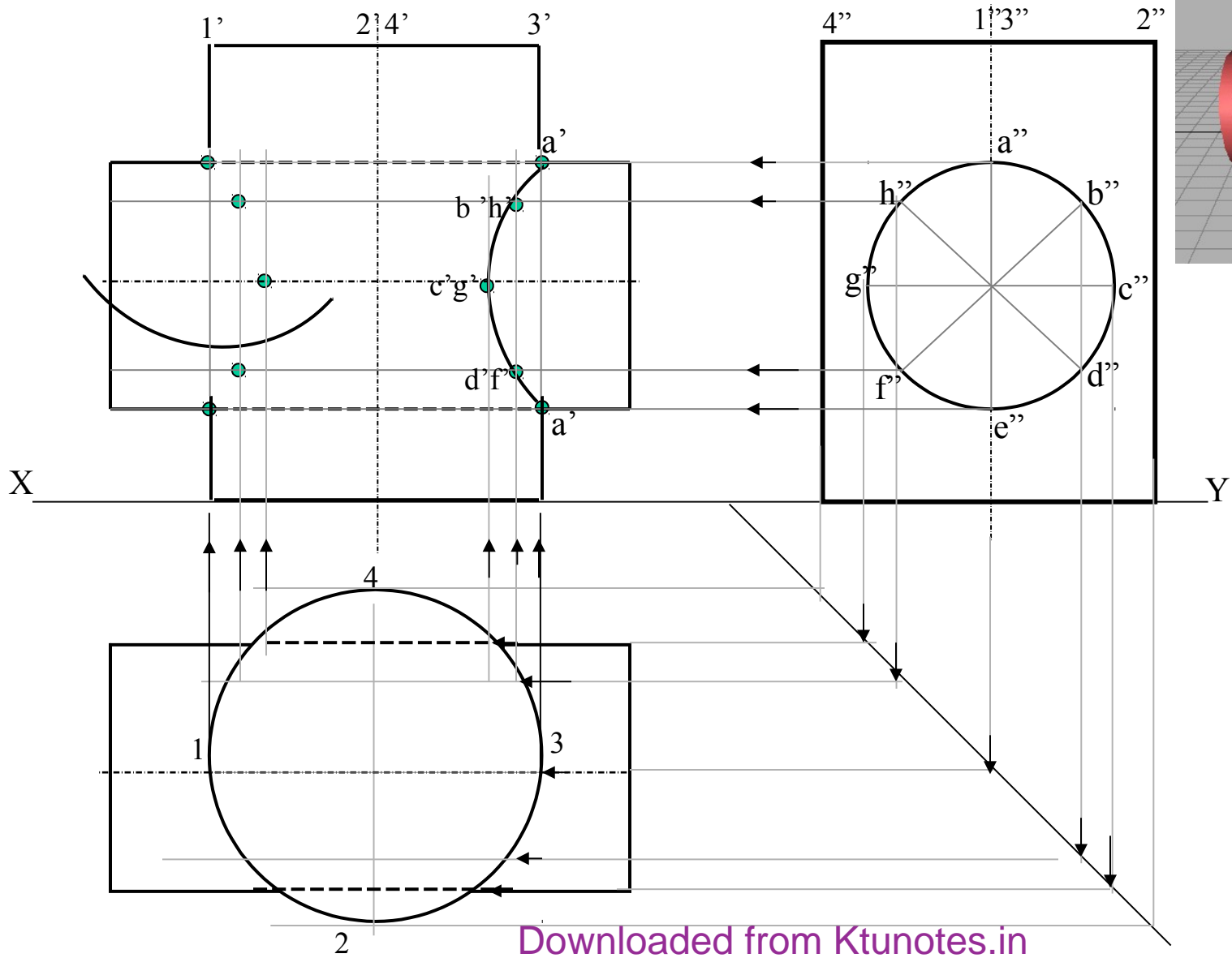
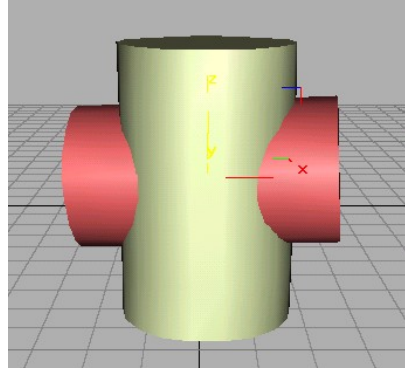
1. CYLINDER TO CYLINDER
2. SQ. PRISM TO CYLINDER
3. CONE TO CYLINDER
4. TRIANGULAR PRISM TO CYLINDER
5. SQ. PRISM TO SQ. PRISM
6. SQ. PRISM TO SQ. PRISM
(SKEW POSITION)
7. SQUARE PRISM TO CONE (*from top*)
8. CYLINDER TO CONE

COMMON SOLUTION STEPS

One solid will be standing on HP
Other will penetrate horizontally.
Draw three views of standing solid.
Name views as per the illustrations.
Beginning with side view draw three
Views of penetrating solids also.
On its S.V. mark number of points
And name those (either letters or nos.)
The points which are on standard
generators or edges of standing solid,
(in S.V.) can be marked on respective
generators in Fv and Tv. And other
points from SV should be brought to
Tv first and then projecting upward
To Fv.
Dark and dotted line's decision should
be taken by observing side view from
its right side as shown by arrow.
Accordingly those should be joined
by curvature or straight lines.

Problem: A cylinder 50mm dia. and 70mm axis is completely penetrated by another of 40 mm dia. and 70 mm axis horizontally Both axes intersect & bisect each other. Draw projections showing curves of intersections.

CYLINDER STANDING & CYLINDER PENETRATING

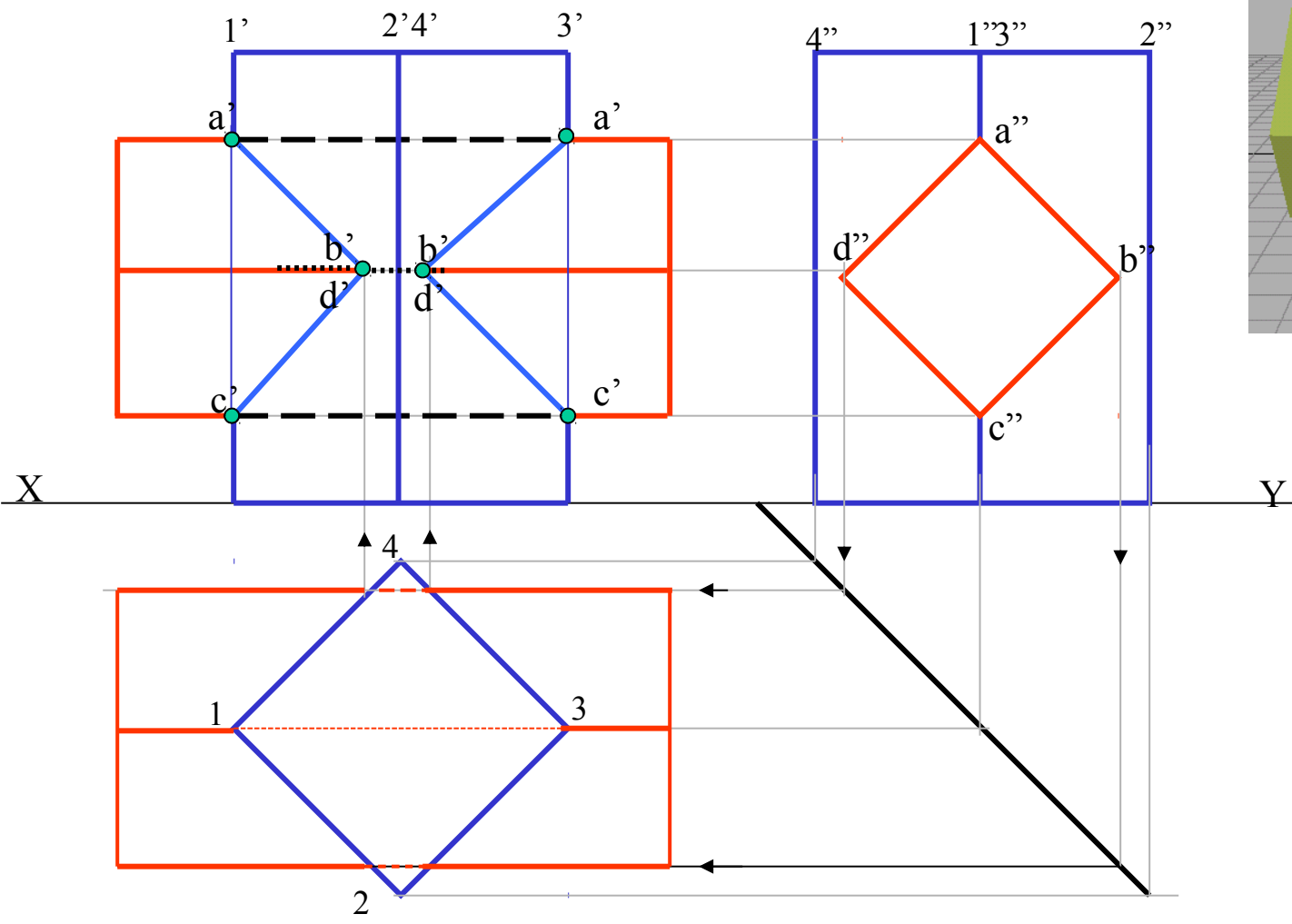
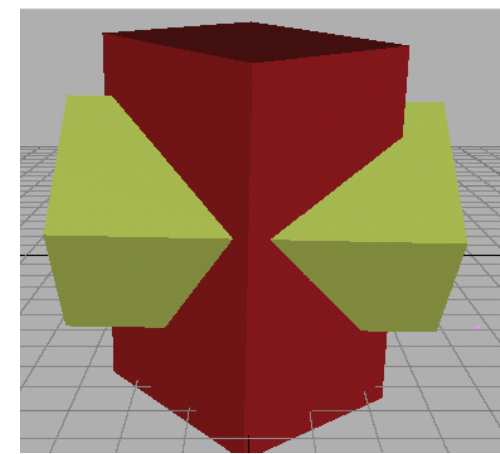




CASE 4.

Problem: A sq.prism 30 mm base sides.and 70mm axis is completely penetrated by another square prism of 25 mm sides.and 70 mm axis, horizontally. Both axes intersects & bisect each other. All faces of prisms are equally inclined to Vp. Draw projections showing curves of intersections.

SQ.PRISM STANDING & SQ.PRISM PENETRATING



END OF SESSION 8