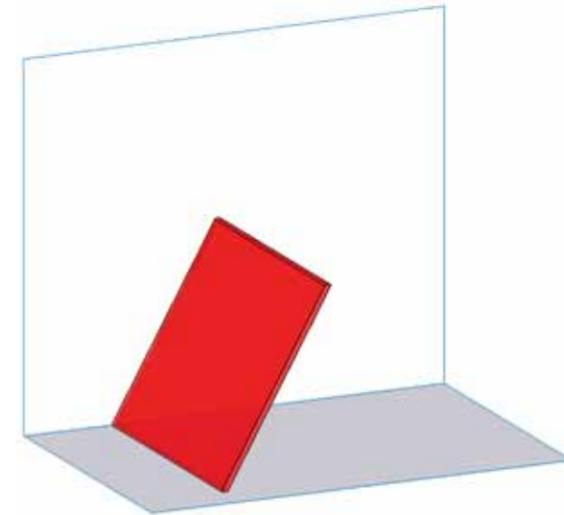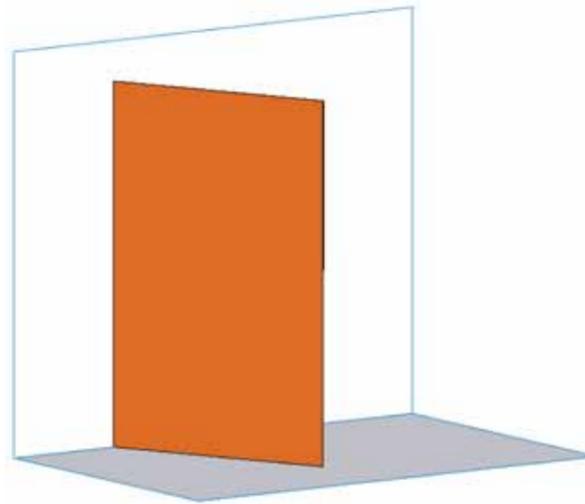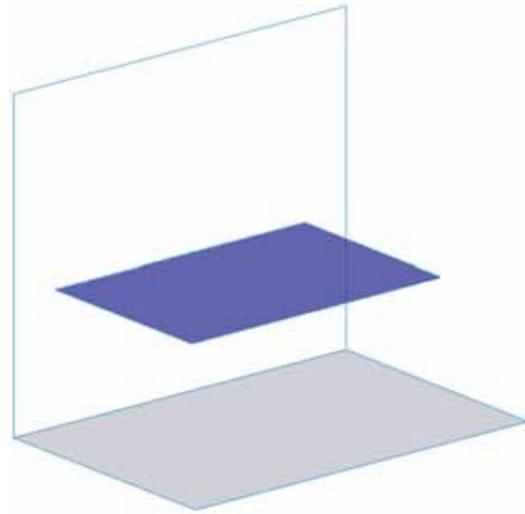Pictorial views of three planes are shown. In the spaces provided below draw the line of intersection of these planes with the planes of reference (traces of the planes).
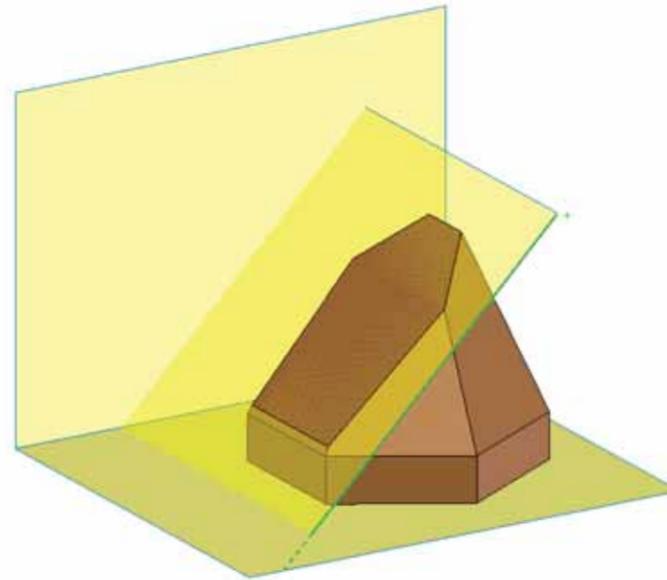
V.P.

H.P.

V.P.

H.P.

V.P.

H.P.

DESIGN & COMMUNICATION GRAPHICS
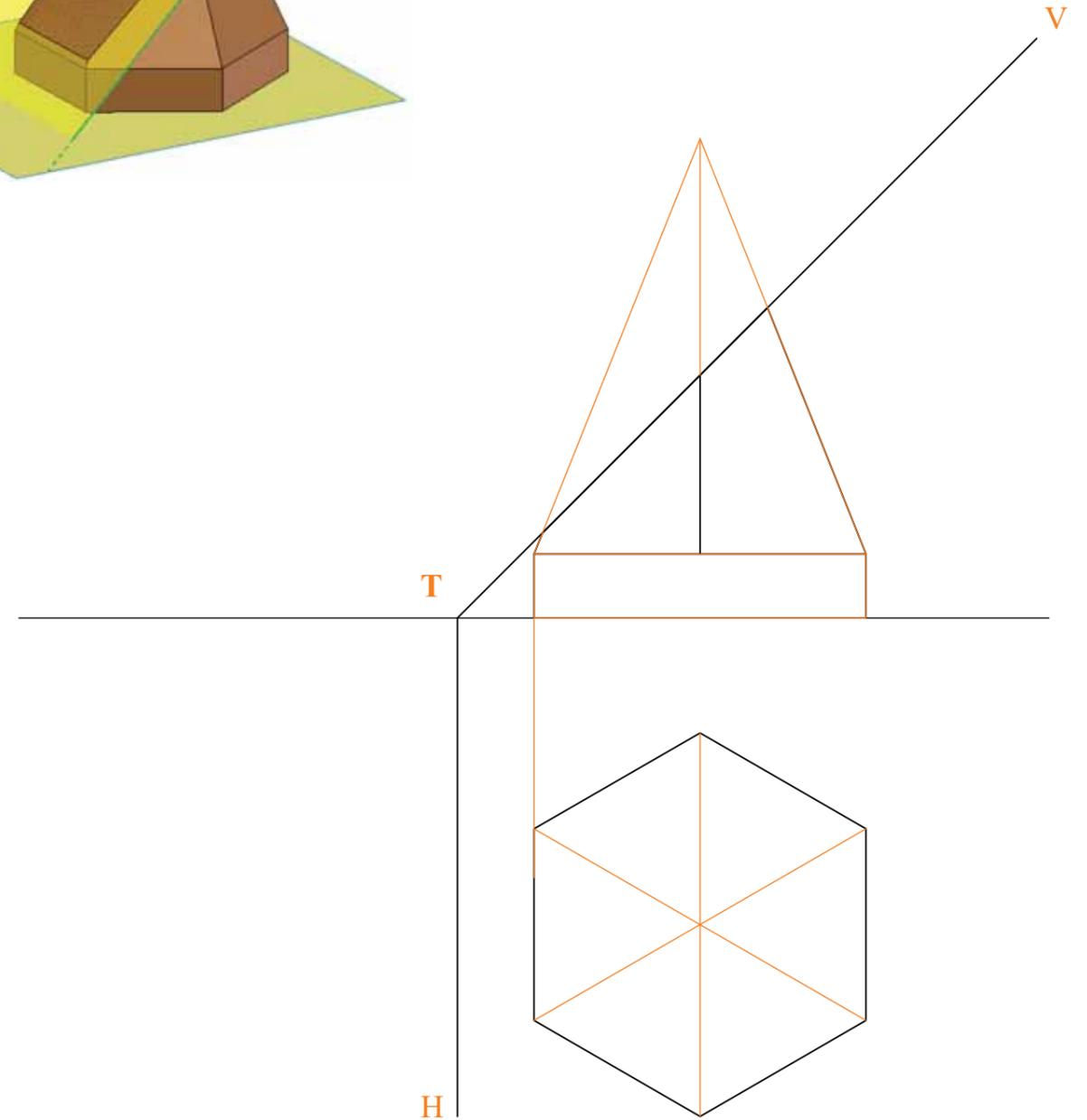
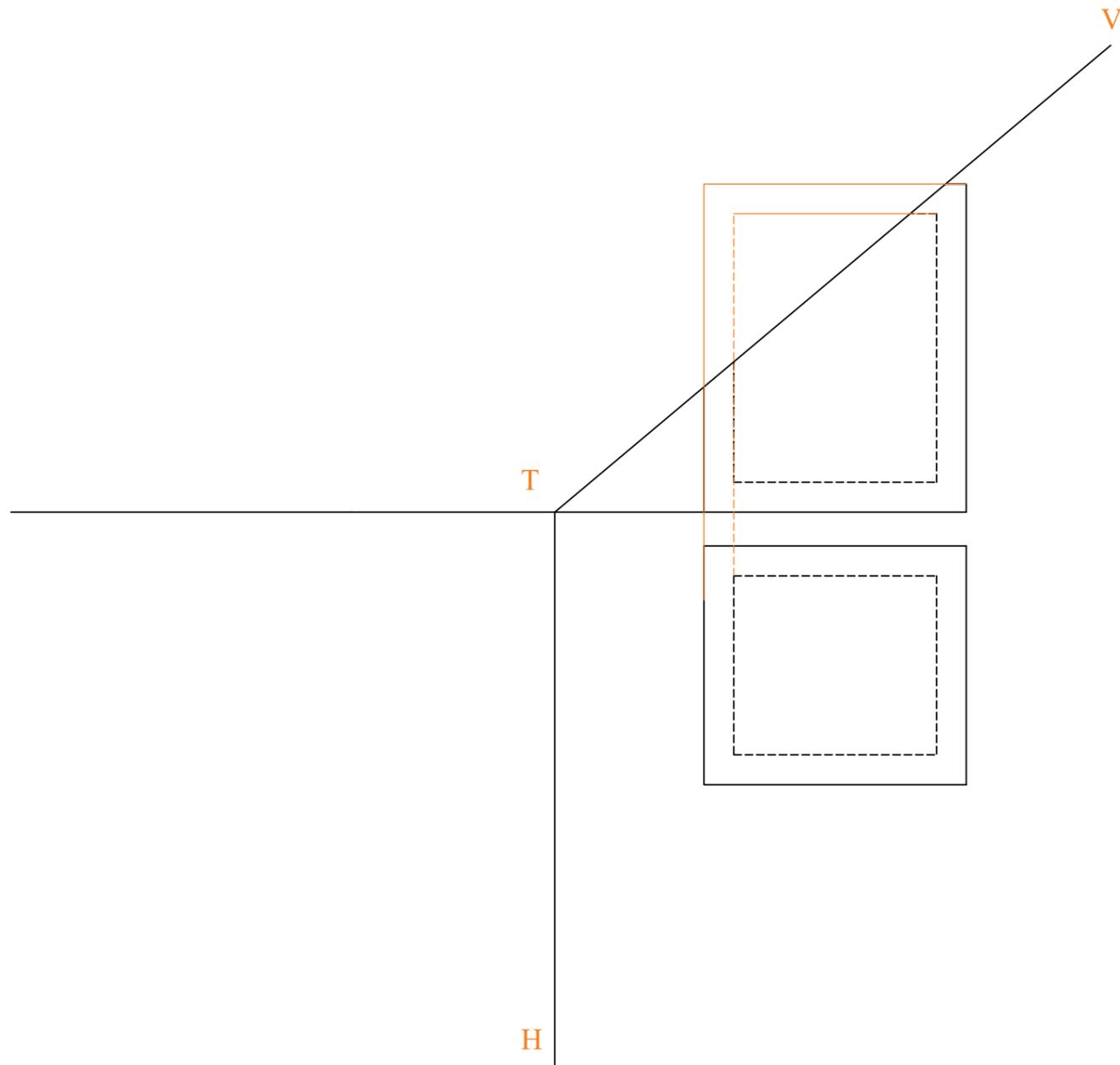**OBLIQUE PLANES 1**

NAME: _____ **DATE:** _____

A box cut by a simply inclined plane is shown.

(a) Complete the plan of the box.
(b) Determine the true shape of the opening.

A hexagonal based pyramid is cut by a simply inclined plane as shown.

(a) Complete the plan of the cut surface.
(b) Determine the true shape of the cut surface.

V

T

H

V

T

H

NAME: _____ **DATE:** _____

A pyramid is cut by a simply inclined plane as shown.

Complete the elevation and show the true shape of the cut section.

A cone cut by a simply inclined plane is used to design the seat shown.

Complete the plan and show the true shape of the cut section.

V

T

H

V

T

H

DESIGN & COMMUNICATION GRAPHICS

OBLIQUE PLANES 3

NAME: _____ DATE: _____

1

2
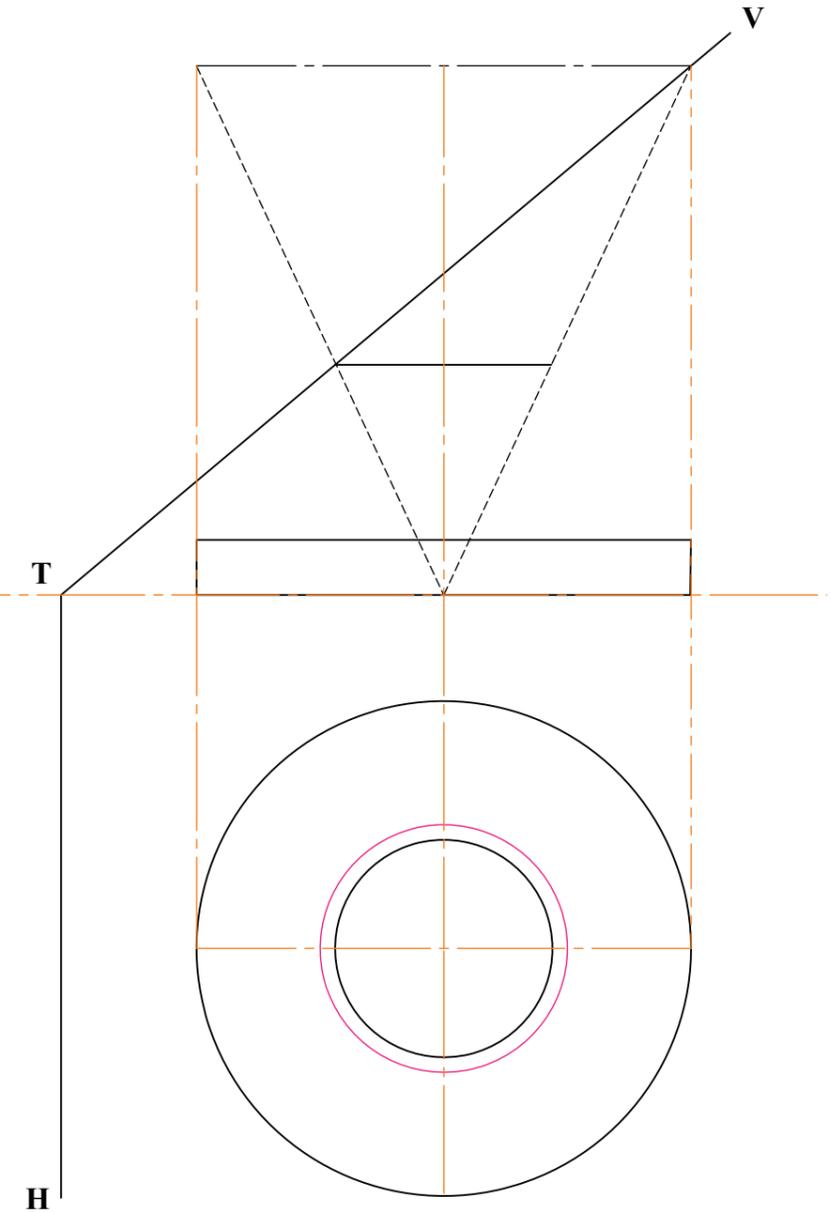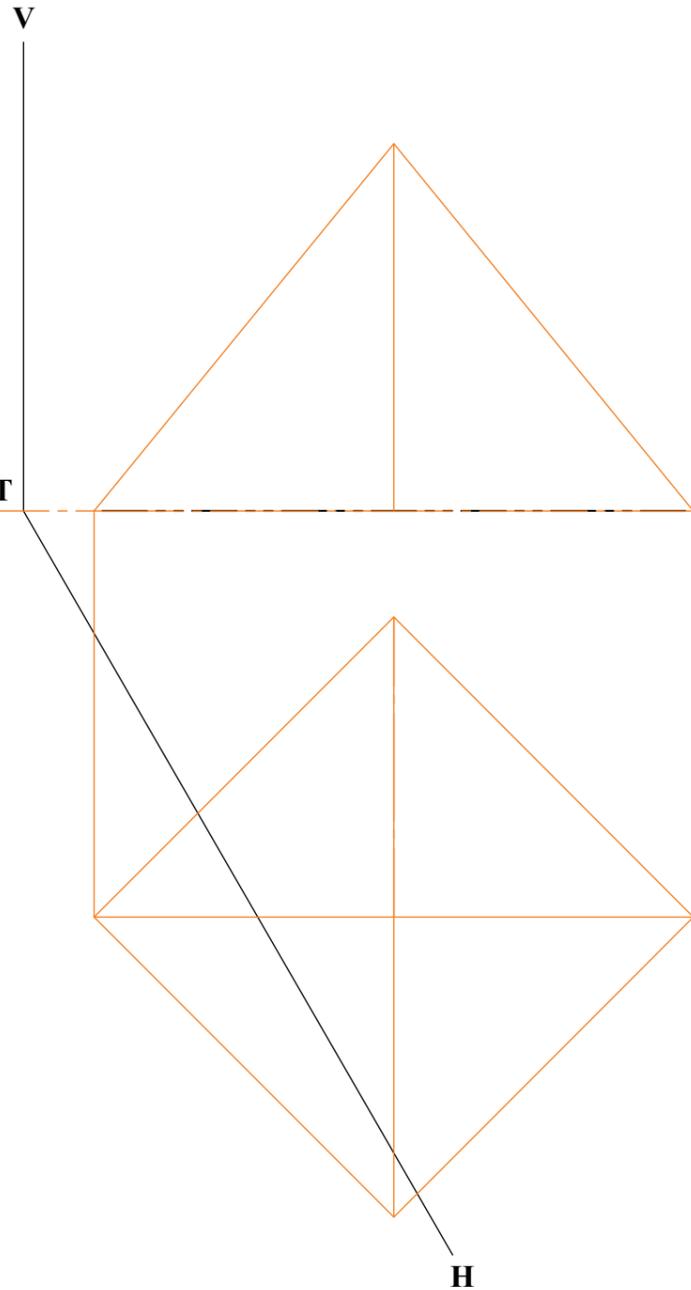
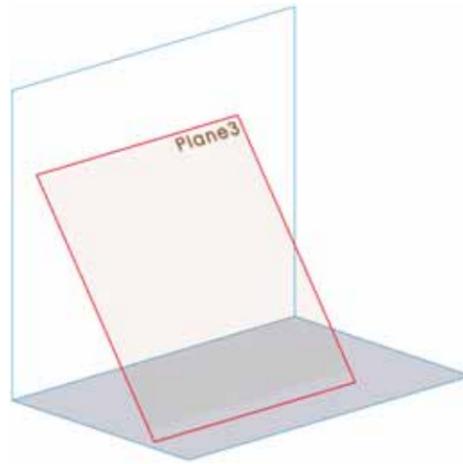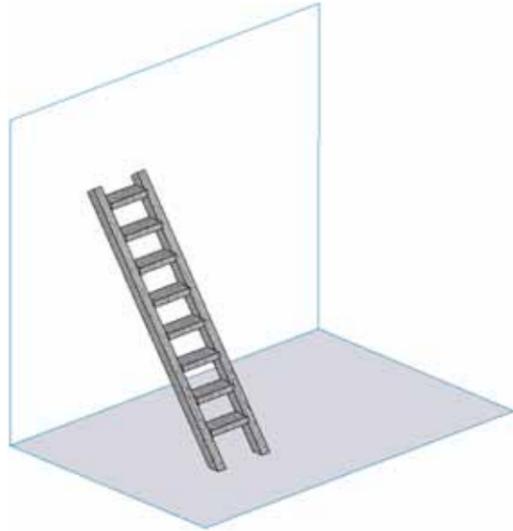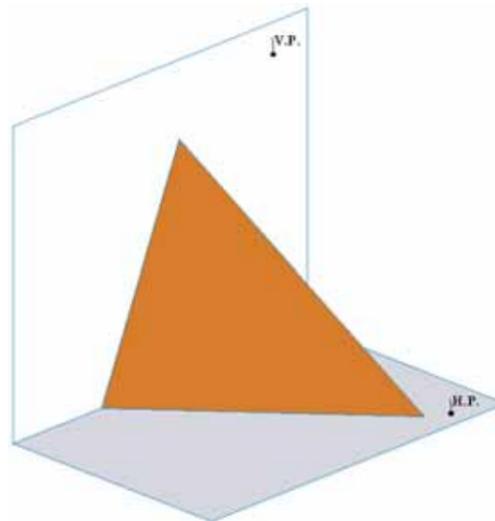In parts 1- 4, draw the horizontal and vertical traces of the planes shown in the space provided.

In part 3, show the projections of the lines on the plane that are parallel to the H.P. in your orthographic views.

In part 4, show the projections of the lines on the plane that are parallel to the V.P. in your orthographic views.

3

4

V.P.

V.P.

H.P.

V.P.

H.P.

DESIGN & COMMUNICATION GRAPHICS
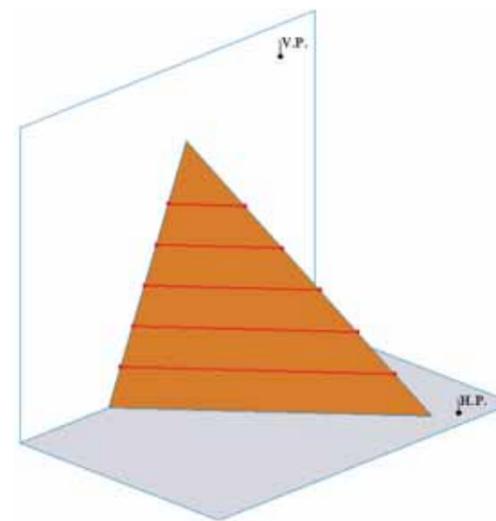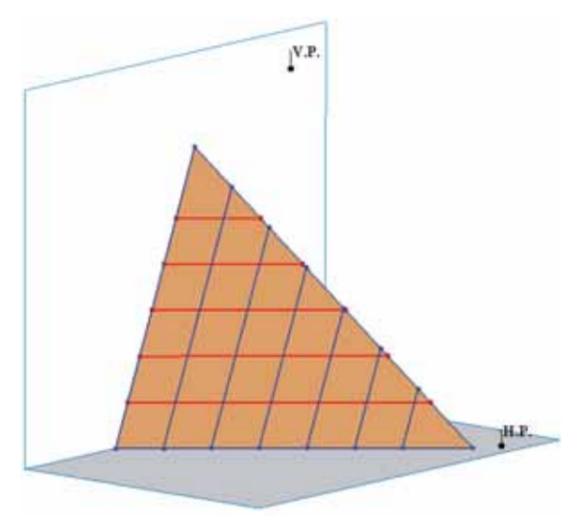
OBLIQUE PLANES 4

NAME: _____ **DATE:** _____

Copenhagen Planetarium

The building shown consists of a cylinder cut by an oblique plane.
The incomplete elevation and plan of the cylinder and the traces of
an oblique plane are shown below.

(a) Complete the elevation and determine the true shape
of the cut surface.
(b) Identify the major and minor axes in
the true shape of the cut surface.

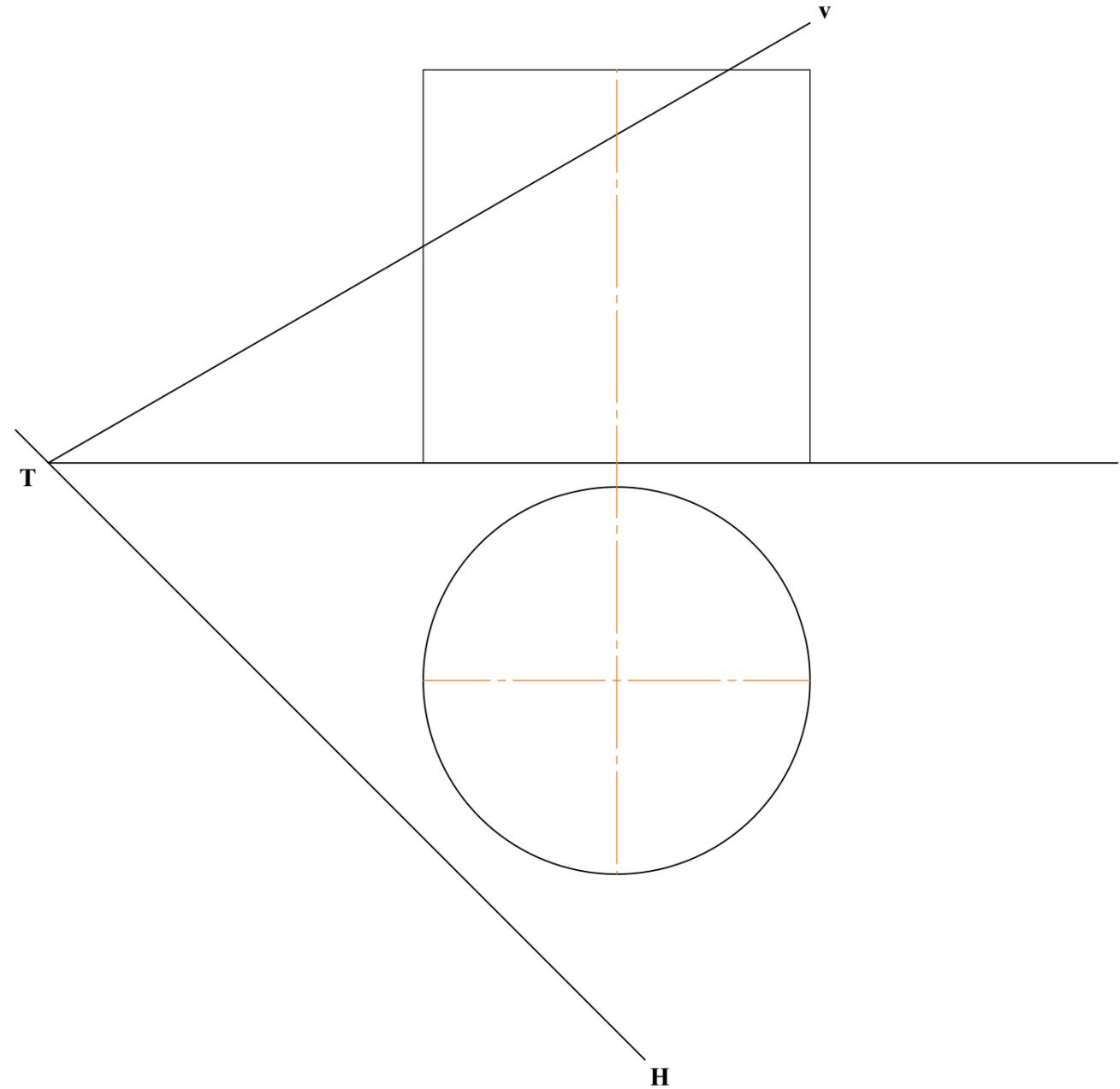The 3D graphic on the right shows a glass trophy which has been engraved as shown. The trophy is based on a truncated pentagonal prism.

The drawing below shows theprojections of the prism and the traces of the oblique plane VTH. trophy is cut to form the sloping face.

(a) Draw the projections of the trophy when cut by the oblique plane VTH.

(b) Determine the inclination of the oblique plane to the horizontal plane.

(c) Hence, or otherwise, determine the true shape of the cut surface.
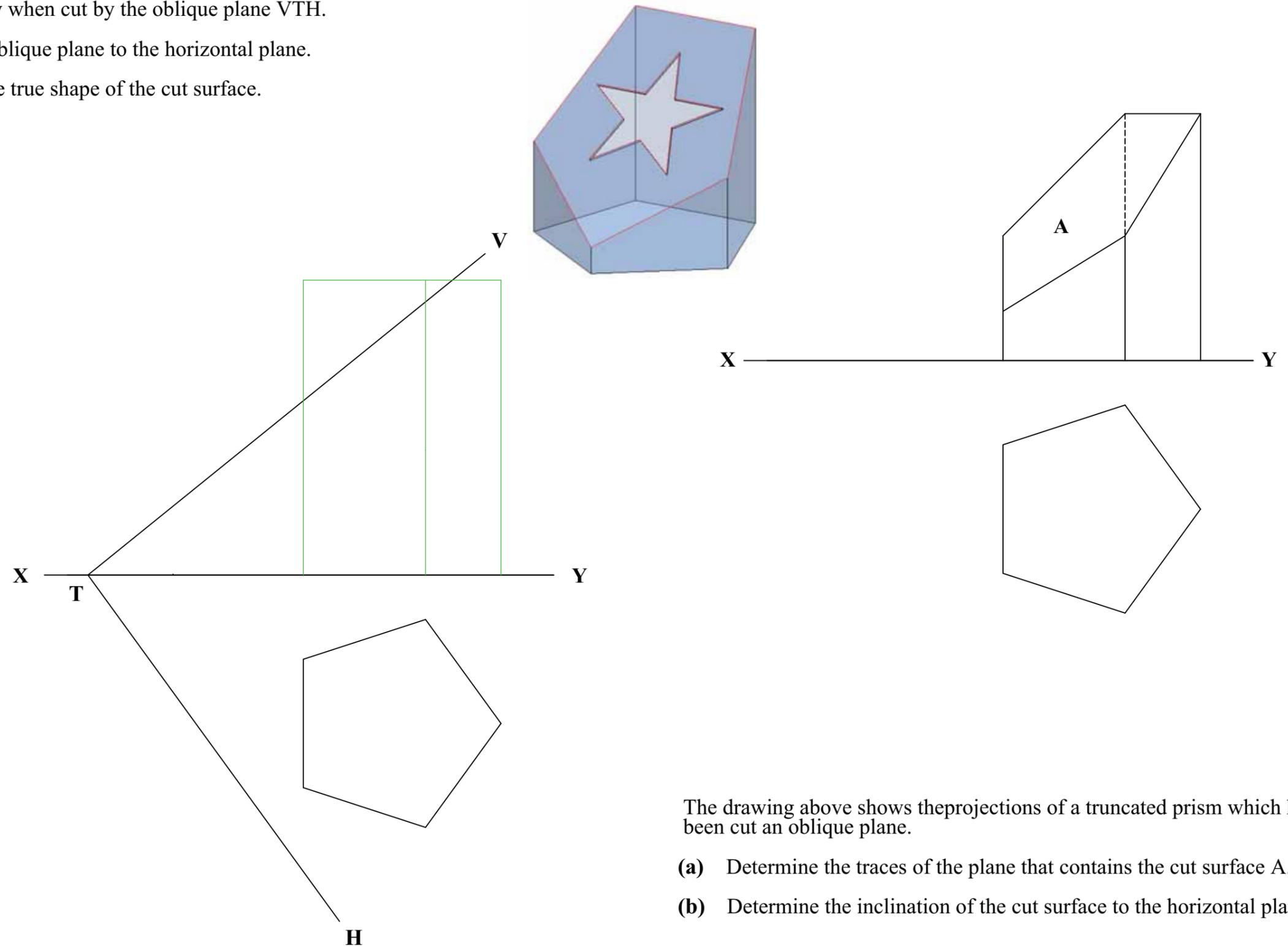
The drawing above shows theprojections of a truncated prism which has been cut an oblique plane.

(a) Determine the traces of the plane that contains the cut surface A.

(b) Determine the inclination of the cut surface to the horizontal plane.

DESIGN & COMMUNICATION GRAPHICS

OBLIQUE PLANES 6

NAME: _____ DATE: _____

The elevation and plan of a sphere that is
to be cut by the oblique plane VTH is given.

Complete the plan and elevation of the
sphere showing the cut section.

V

T

H

NAME: _____ DATE: _____

V

X   T   Y

H

The partial elevation and plan of a jewellery display stand is shown.
Draw the projections of the jewellery stand when cut by the oblique plane VTH.
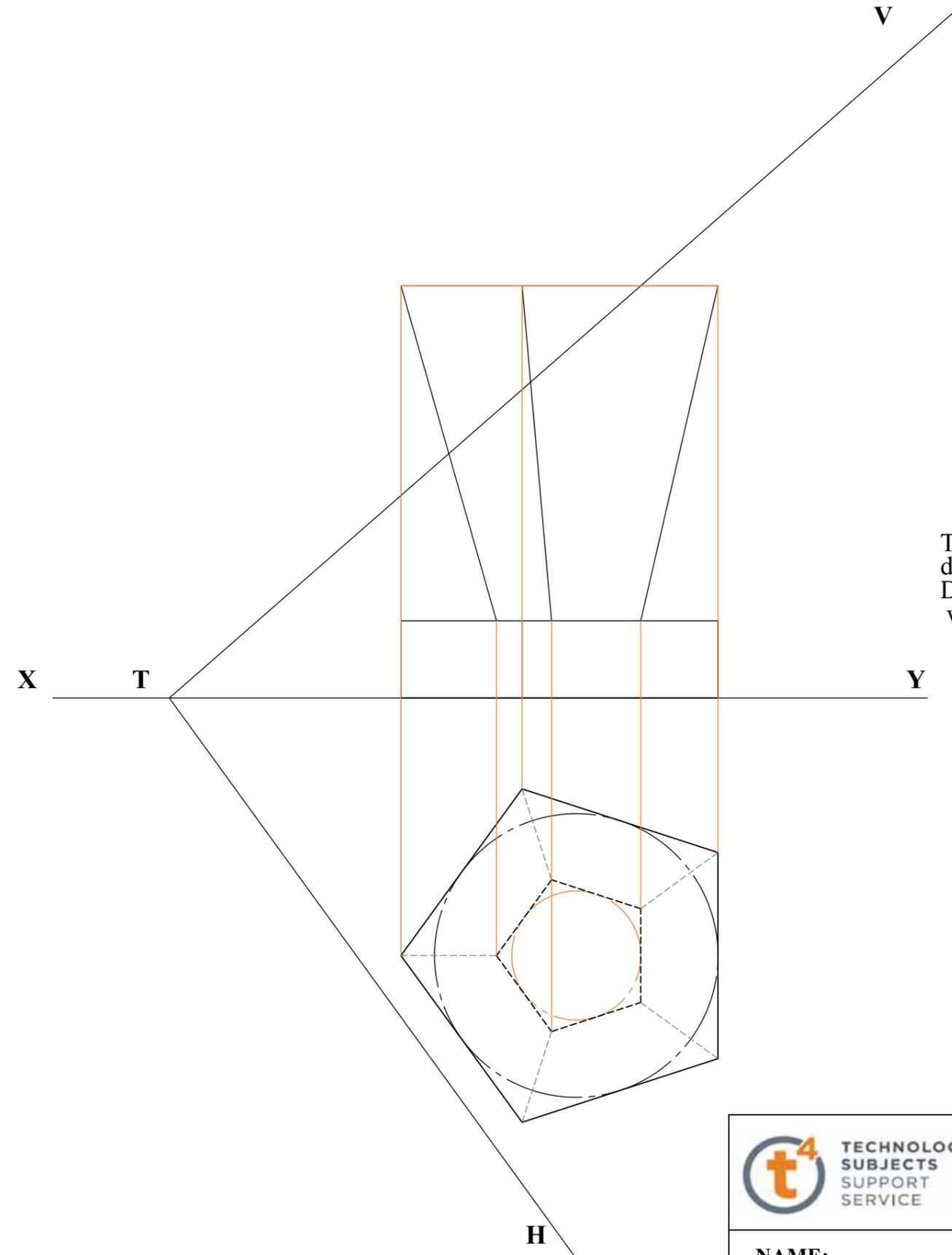
NAME: _____   DATE: _____

The 3D graphic below shows a sandwich board. The projections of the board are also shown.

(a) Determine the traces of the oblique plane that contains the surface A.

(b) Determine the true shape of board A.

(c) A design based on a star (shown below) must be placed at the centre of the sloping surface of the board marked A.

Draw the projections of the star.

Ø 35

A

X ———————————————————————————— Y

A

TECHNOLOGY SUBJECTS SUPPORT SERVICE **DESIGN & COMMUNICATION GRAPHICS**

OBLIQUE PLANES 9

NAME: _____ DATE: _____
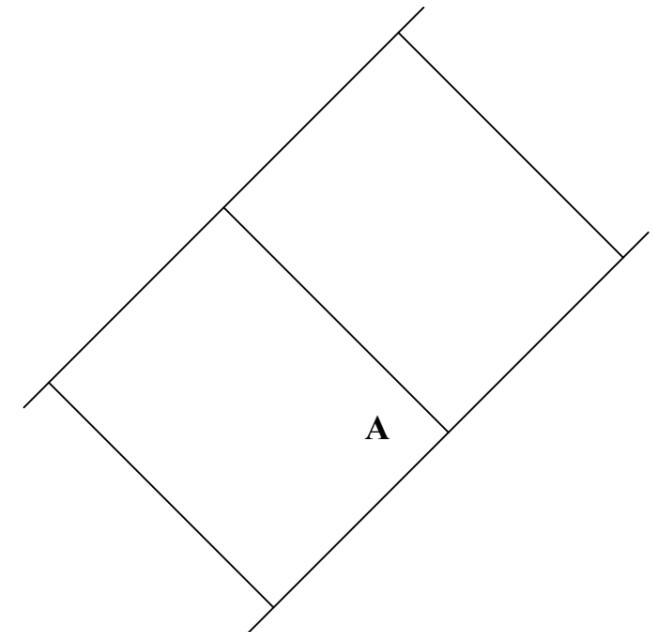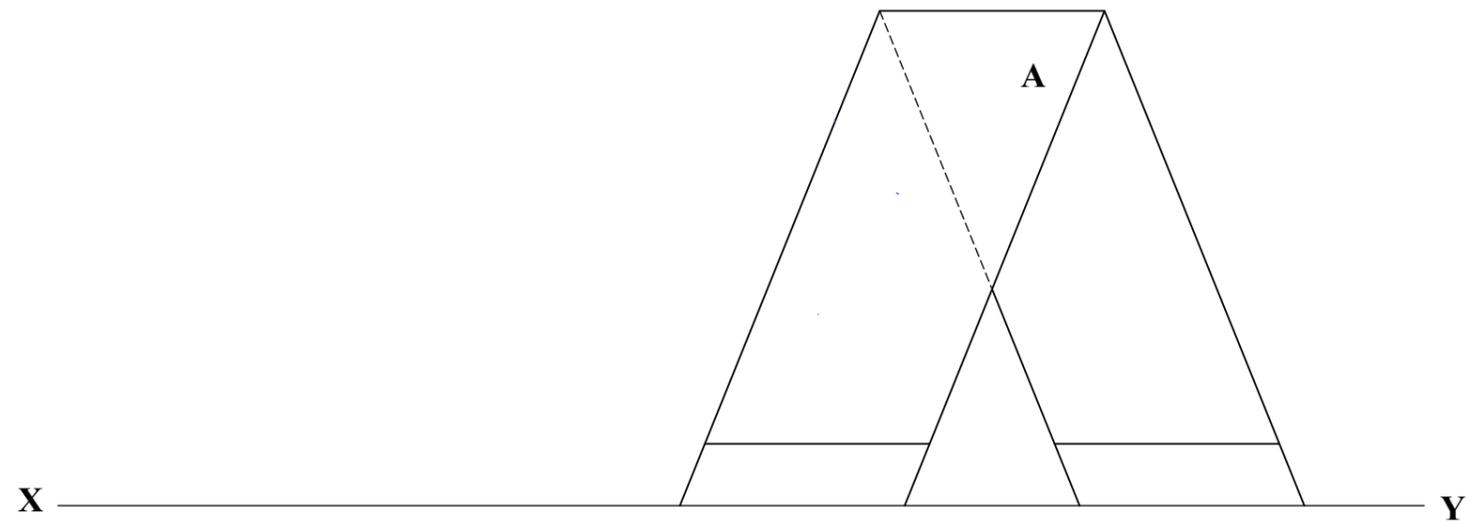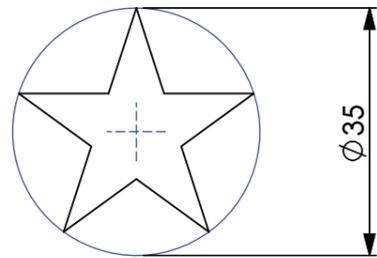
A 3D graphic of a pocket mirror is shown below. It consists of two hexagonal prisms which are equal in height and hinged about edge AB of the hexagon as shown.

The plan and elevation of the base are given across. The lid is inclined at 50° to the base and is hinged about line ab.

Draw the plan and elevation of the lid in its inclined position.

a   b

lid

base

B

A

a

b

NAME: _____ DATE: _____
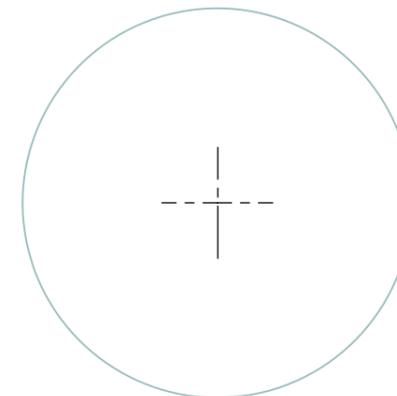
A 3D graphic of a knife block is shown above. The block is based on an oblique cylinder which is cut as shown.

The incomplete plan of an oblique cylinder is given along with the traces of an oblique plane which cuts it. The axis of the cylinder is perpendicular to the oblique plane.
.
(a)   Complete the plan and draw the elevation of the cut cylinder.

(b)   Find the true shape of the cut surface.

(c)   A knife is inserted into the block in the centre of the cut surface and at right angles to it. The length of the handle left protruding is 50mm.

Using a line to represent the handle, draw the handle in position in plan and elevation.

NAME: _____   DATE: _____

1. The plan and elevation of a dice is shown.
(a) Indicate surfaces A and B in plan.
(b) Show the dihedral angle between the two surfaces.

2. The plan and elevation of a hip roof is shown.
   Find the dihedral angle between surfaces A and B.

3. The plan and elevation of two glass panels of an extractor fan are shown.
   • Find the dihedral angle between the panels.
   • Find the line of intersection between the panels.

X   Y

A   B

A

B

Dihedral angle

a   b
e,h   f,g
d   c

h   g
d   c
a   b
e   f

NAME: _____   **DATE:** _____
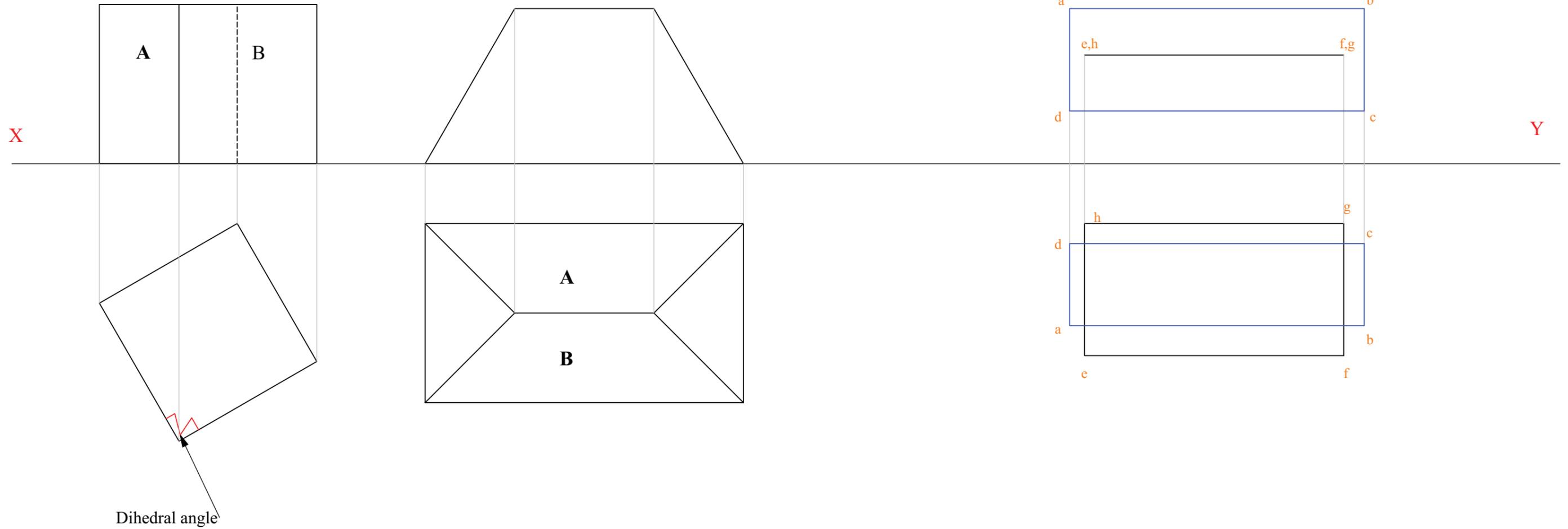
The 3D graphic below shows a package for Ferrero Rocher chocolates which is based on a square based right pyramid. The projections of the pyramid are shown below.

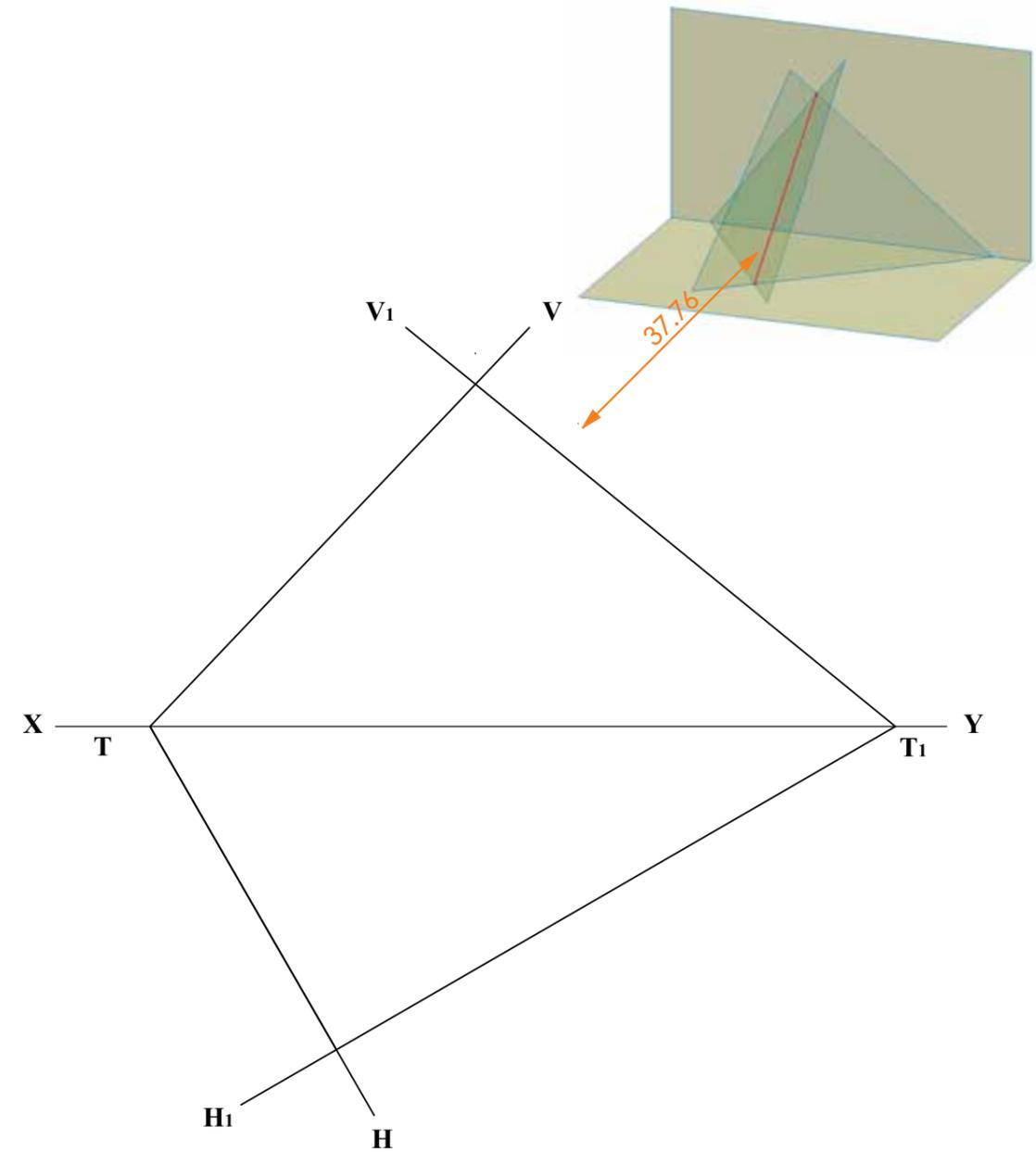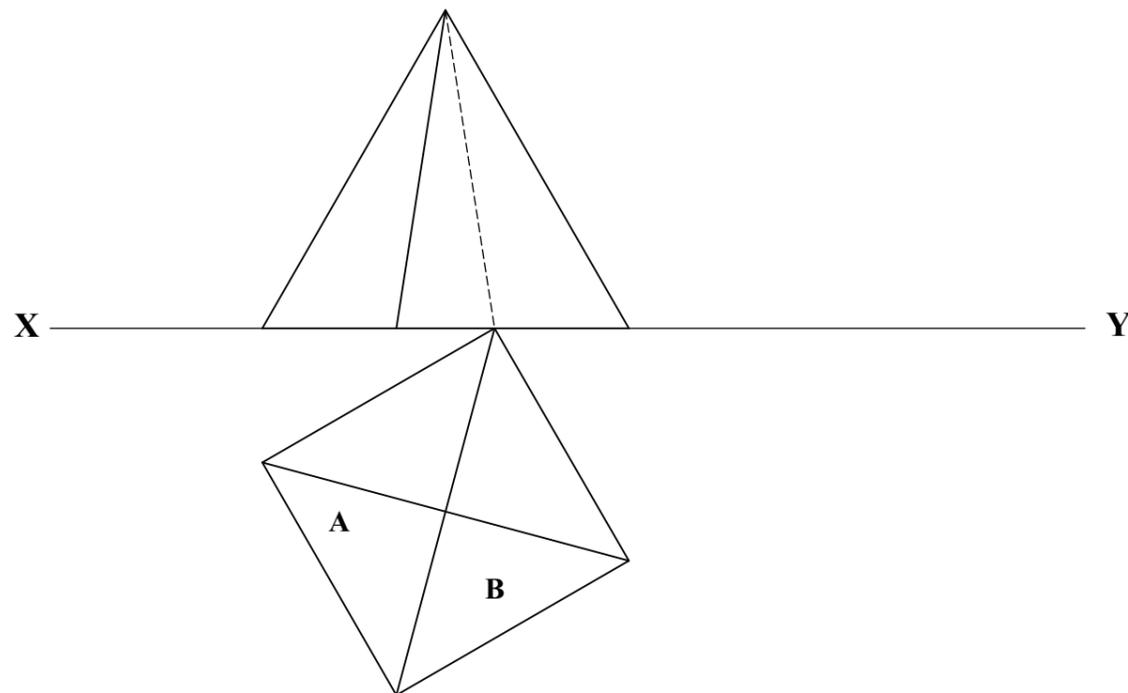**(a)** Determine the traces of the oblique plane that ontains:

      (i)   the surface A
      (ii)   the surface B

(b) Determine the line of intersection between the planes.

(c) Deteermine the inclination of surface A to the horiontal plane.

(d) Determine the true shape of surface A.

V_1 V

37.76

X T T_1 Y

H_1 H

The traces of two oblique planes VTH and $V_1T_1H_1$ are shown above.

(a) Determine the line of intersection between the planes.

(b) Deteermine the inclination of the plane VTH to the horiontal plane.

(c) Determine the true shape of the oblique plane VTH.

X Y

A

B

A 3D graphic of a lamp is shown across. The elevation and plan of the lamp shade are shown below.

(a) Determine the traces of the planes which rest on the surfaces A and B.
(b) Complete the line of intersection between the oblique planes.
(c) Determine the dihedral angle between the planes.
(d) Find the true inclination of the oblique plane that contains the surface A to the planes of reference.

A

B

DESIGN & COMMUNICATION GRAPHICS

OBLIQUE PLANES 14

NAME: _____   DATE: _____
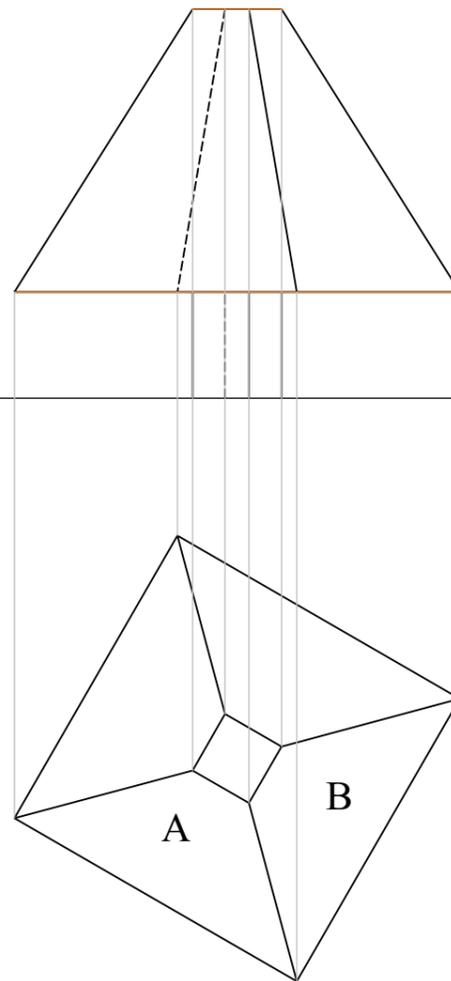
The 3D graphic on top shows a bay window. The outline for a roof over the bay window is shown in the drawing above. The roof surface B has an inclination of 40° to the horizontal plane.

(a)   Draw the elevation of the roof showing the lines of intersection between the surfaces A, B and C.
(b)   Find the true length of the hip rafter between A and B.
(c)   Determine the dihedral angle between surfaces A and B.
(d)   A 450mm cable from point X rests on surface C and touches the hip rafter between surfaces B and C.
      Show this cable in plan and elevation and determine the true inclination of the cable to the H.P.

Scale: 1:10
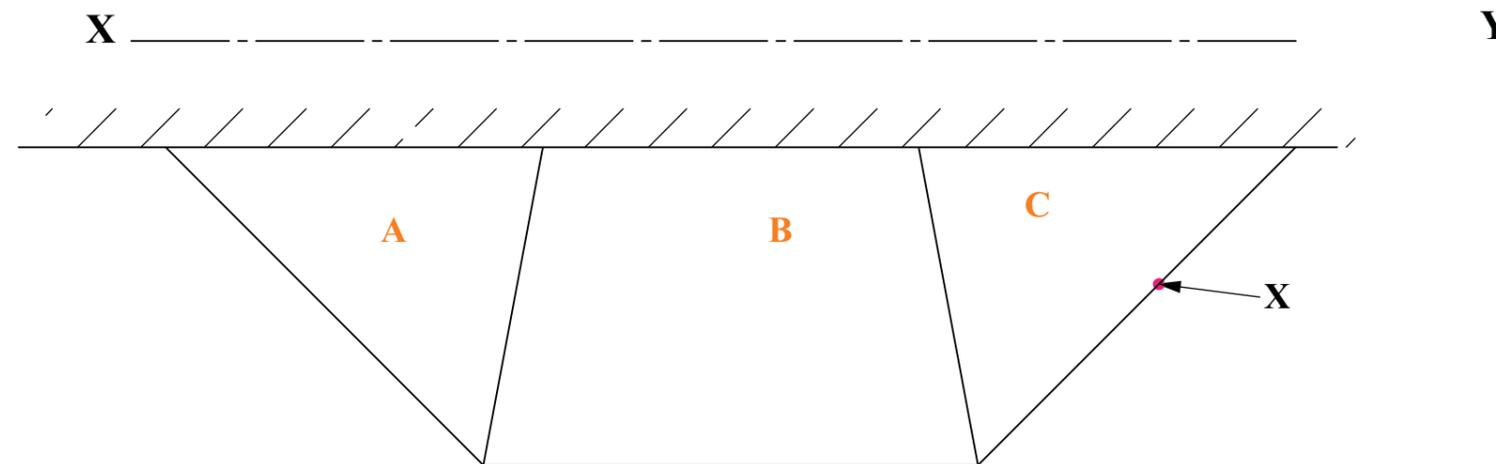
X

Y

A

B

C

X

A 3D graphic of the front of an aircraft is shown. The elevation and incomplete plan is given below.

(a) Determine the dihedral angles between A and B.

(b) Determine the true shape of surface A

(c) On windshield A a wiper blade rests at 45° to the edge ab. The blade pivots about the midpoint of ab.
Draw the wiper blade in this position in elevation and plan.

(d) The dihedral angle between B and C is 145°. Complete the plan.