

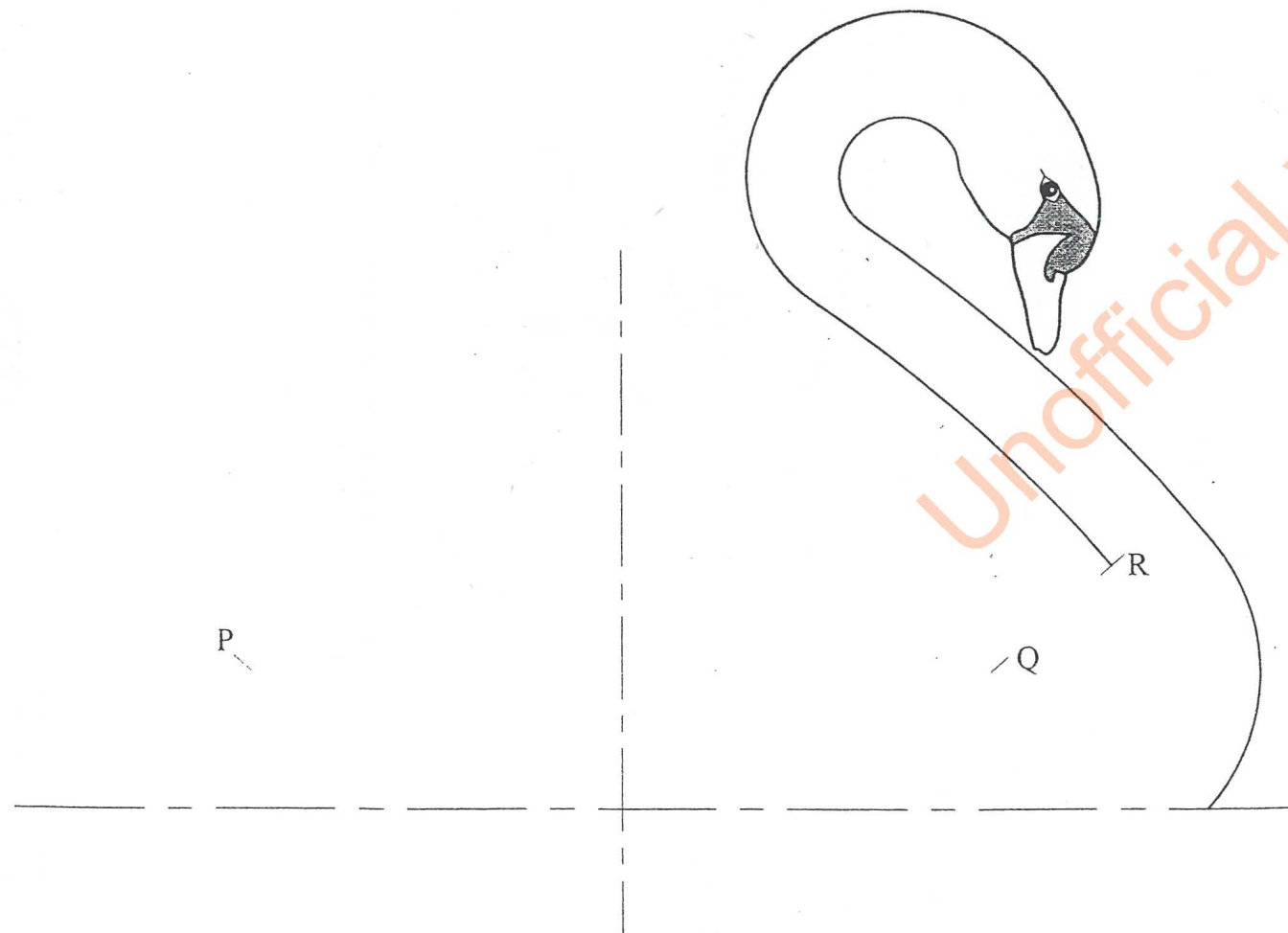
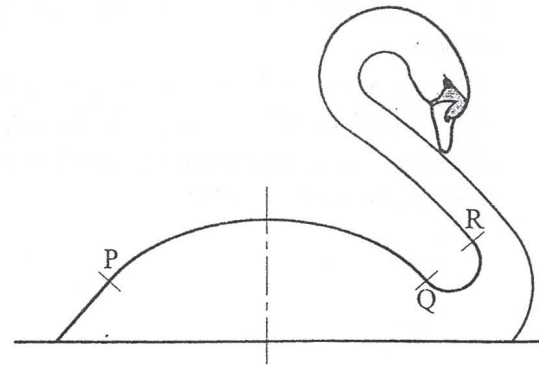
Question 1.

The profile of a swan is shown on the right.
The start centre lines, the head and the neck of the swan are drawn below.

Complete the profile of the swan by constructing:

- a part ellipse P Q, having a major axis of 120mm and a minor axis of 80mm,
- a tangent to the ellipse at the point marked P,
- a normal to the ellipse at the point marked Q,
- a semi circle Q R, on the normal constructed, tangential to the ellipse at Q and the point R.

(10 marks)



Question 2.

A line drawing of a cartoon elephant with the necessary dimensions is shown below. Part of the outline of the elephant is already given below.

Complete the outline by using the given dimensions and clearly showing the constructions you used to locate the centres of the arcs.

Arc from centre A = 24mm

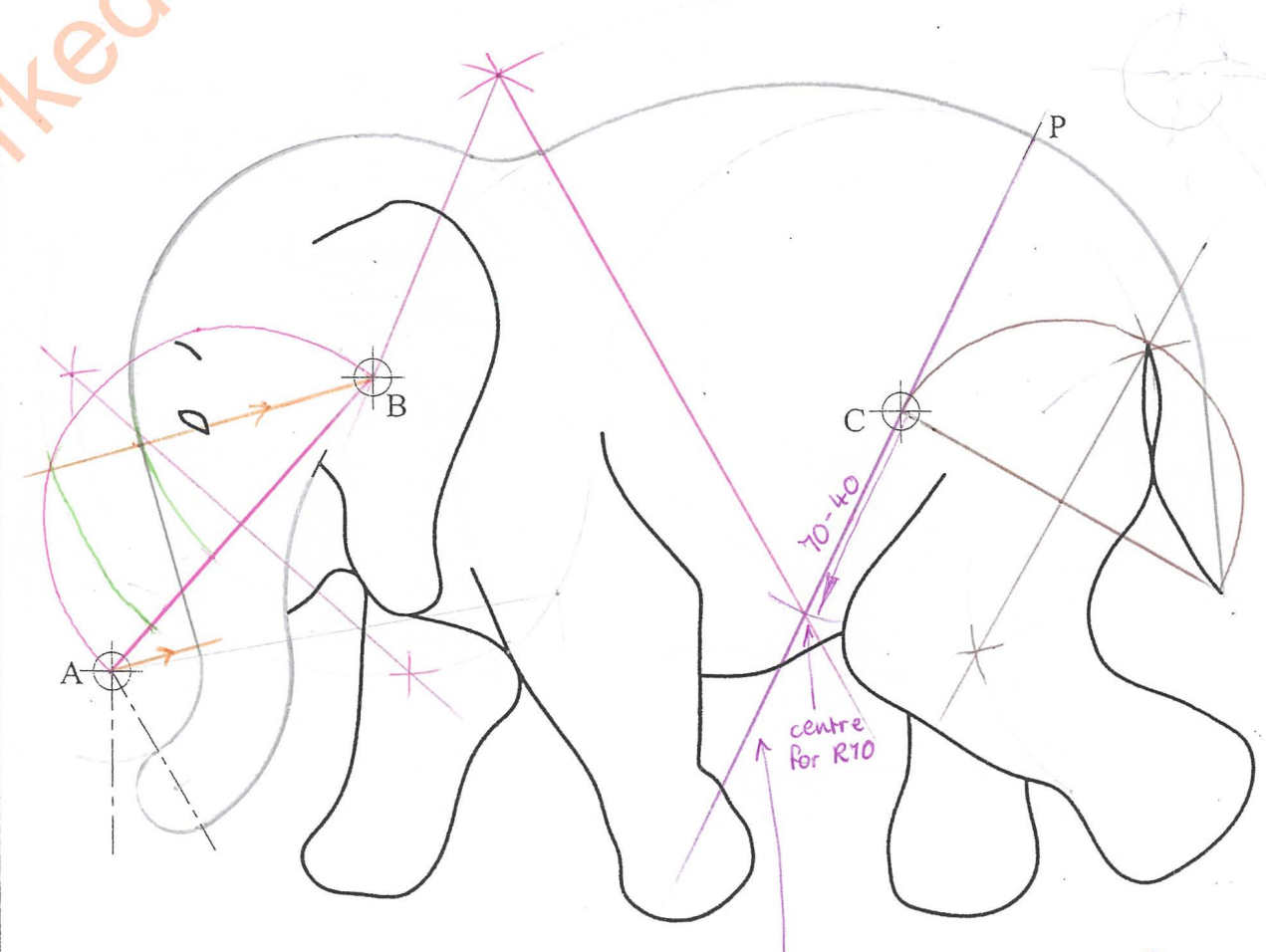
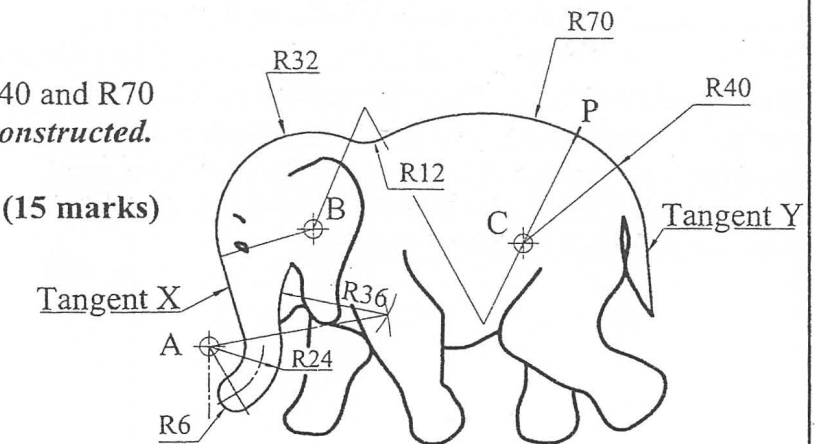
Arc from centre B = 32mm

Arc from centre C = 40mm

P is the point of tangency between R40 and R70

Note: Tangents X and Y are to be constructed.

(15 marks)



Since the tangential point P is given, you should draw a line that passes through CP. Centre for R70 is somewhere on that line.

Question 3

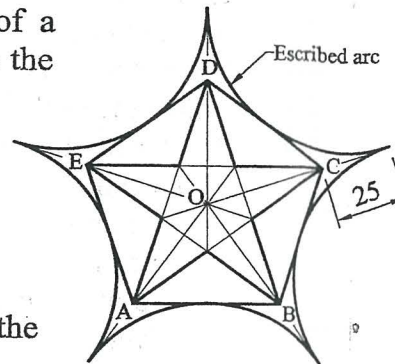
The figure on the right shows a proposed geometric logo, which consists of a pentagon with extended radial lines and five escribed arcs. The star inside the pentagon, is formed by joining the opposite corners of the pentagon. The triangle ABC, printed below, is part of the pentagon ABCDE.

By using a geometrical construction:

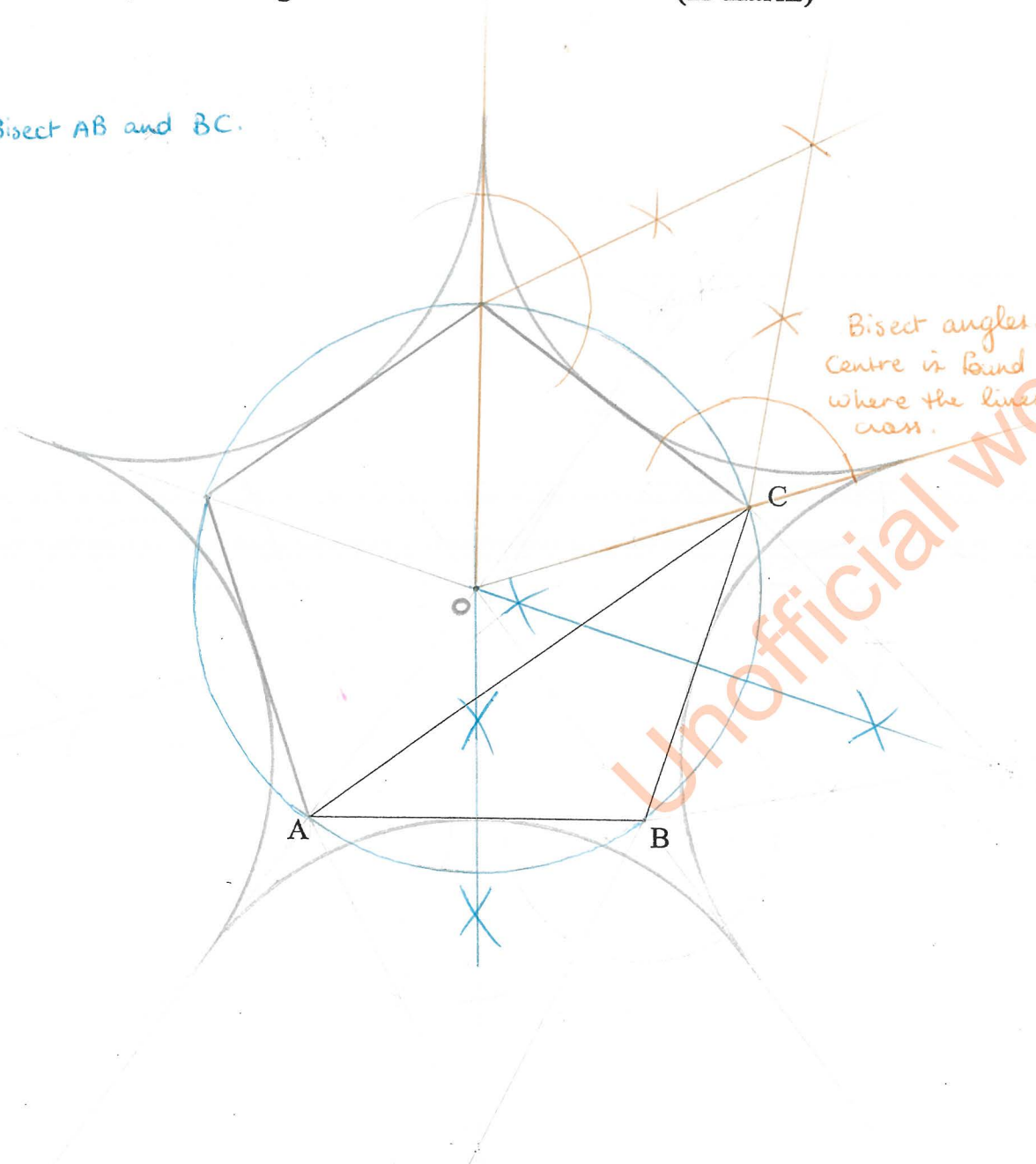
- circumscribe a circle to touch the corners A, B and C;
- label the centre of the circle drawn, O and complete the pentagon;
- extend radials OA, OB, OC, OD and OE by 25mm;
- escribe by construction, one arc to touch one side of the pentagon and the two adjacent extended radials. Copy the other four arcs;
- draw the five pointed star and draw in thick lines the inner pentagon.

Note: Do not shade your drawing.

(13 marks)



STEP 1 : Bisect AB and BC.



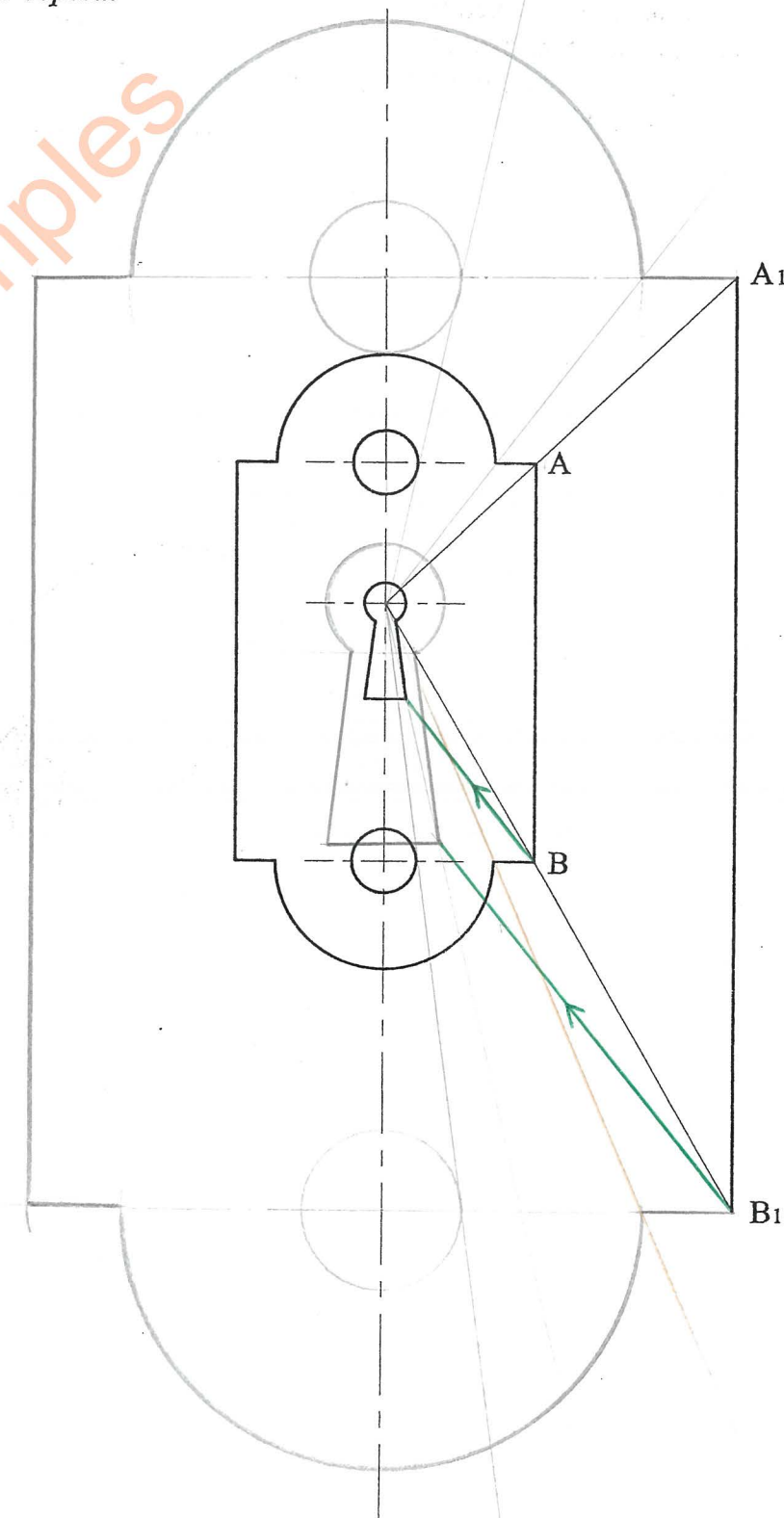
Question 4.

The ornamental plate shown below, is to be placed round a keyhole opening of a drawer.

By means of geometrical construction, enlarge the drawing of the plate, such that side AB is increased in size to the length of line A₁B₁ drawn below.

Note: At least **one half of the plate**, is to be constructed geometrically, the other half may be mirror copied.

(14 marks)

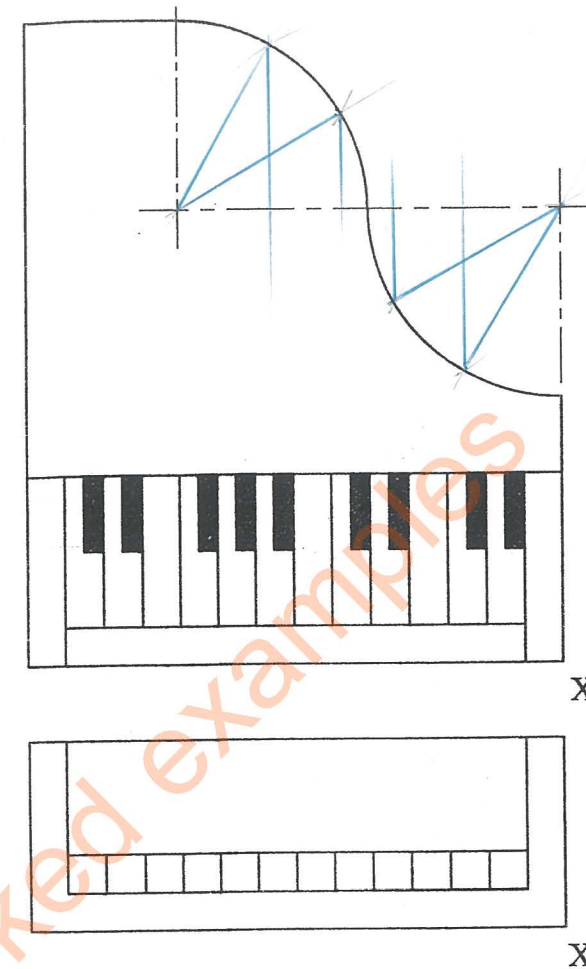
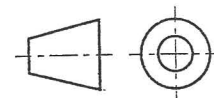
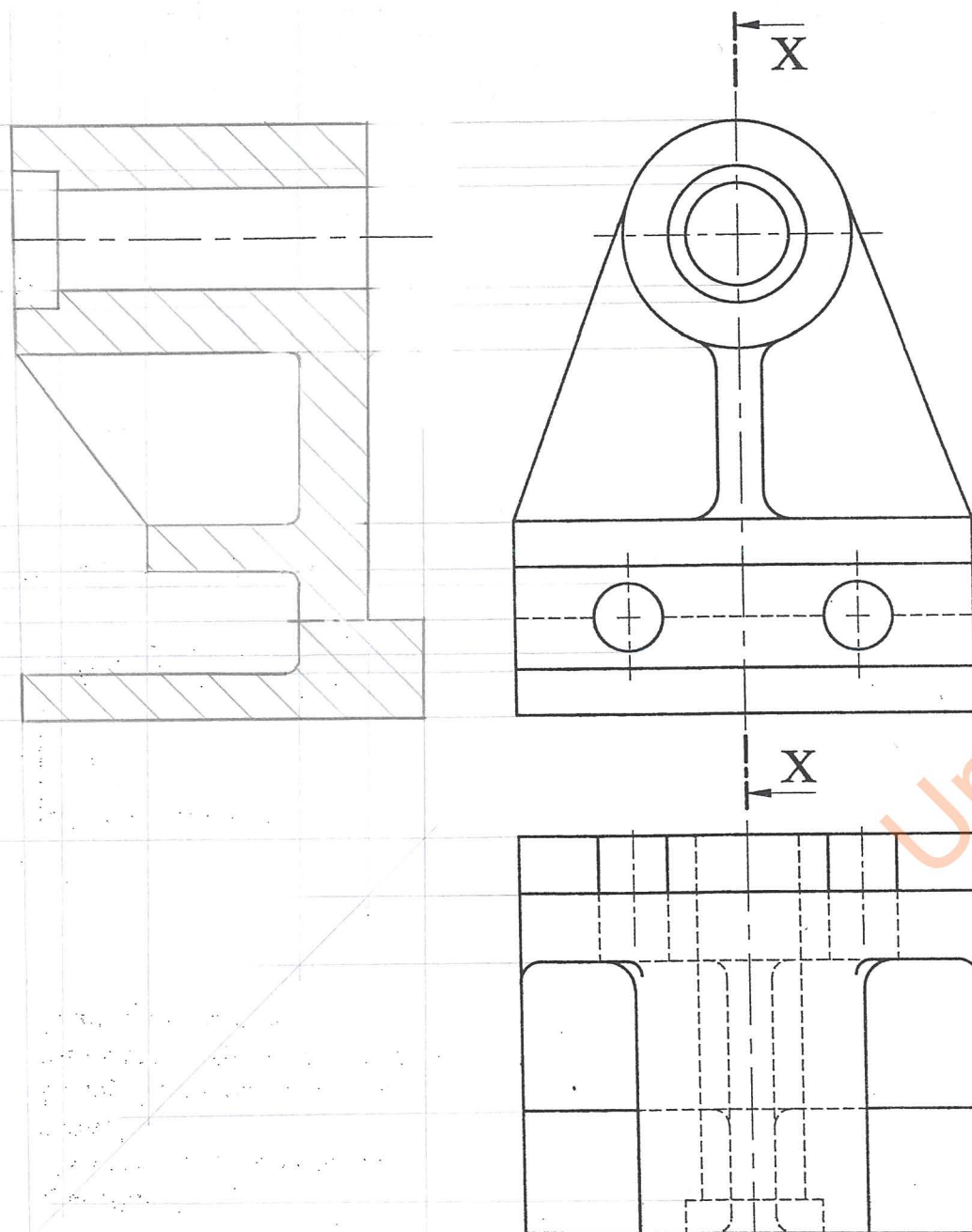
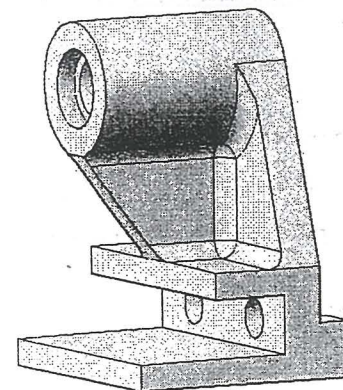
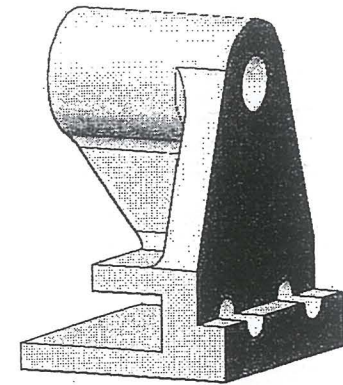


Question 5.

A front elevation and a plan view of a bracket are shown in first angle orthographic projection.

Project a sectional end/side elevation on the cutting plane X-X shown in the front elevation.

(14 marks)



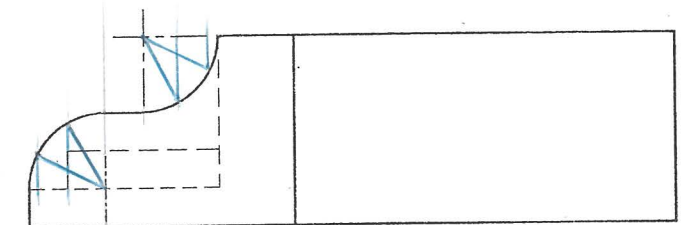
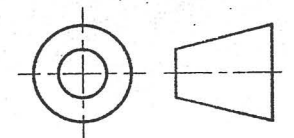
Question 6.

Three full size orthographic views of a toy piano are given.

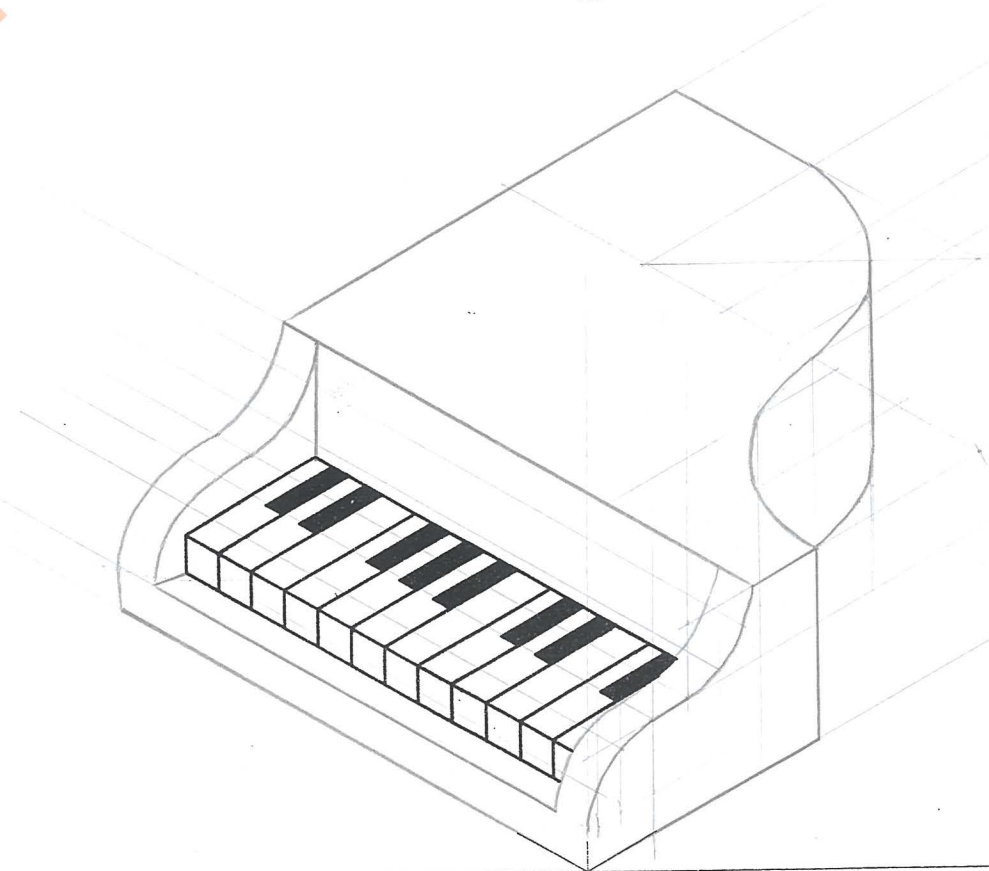
Using the given start lines, draw an isometric view of the piano placing the corner X in the lower most position.

Note: All the visible keys of the piano are already drawn in the isometric start lines.

(16 marks)



All measurements are obtained from the orthographic views.



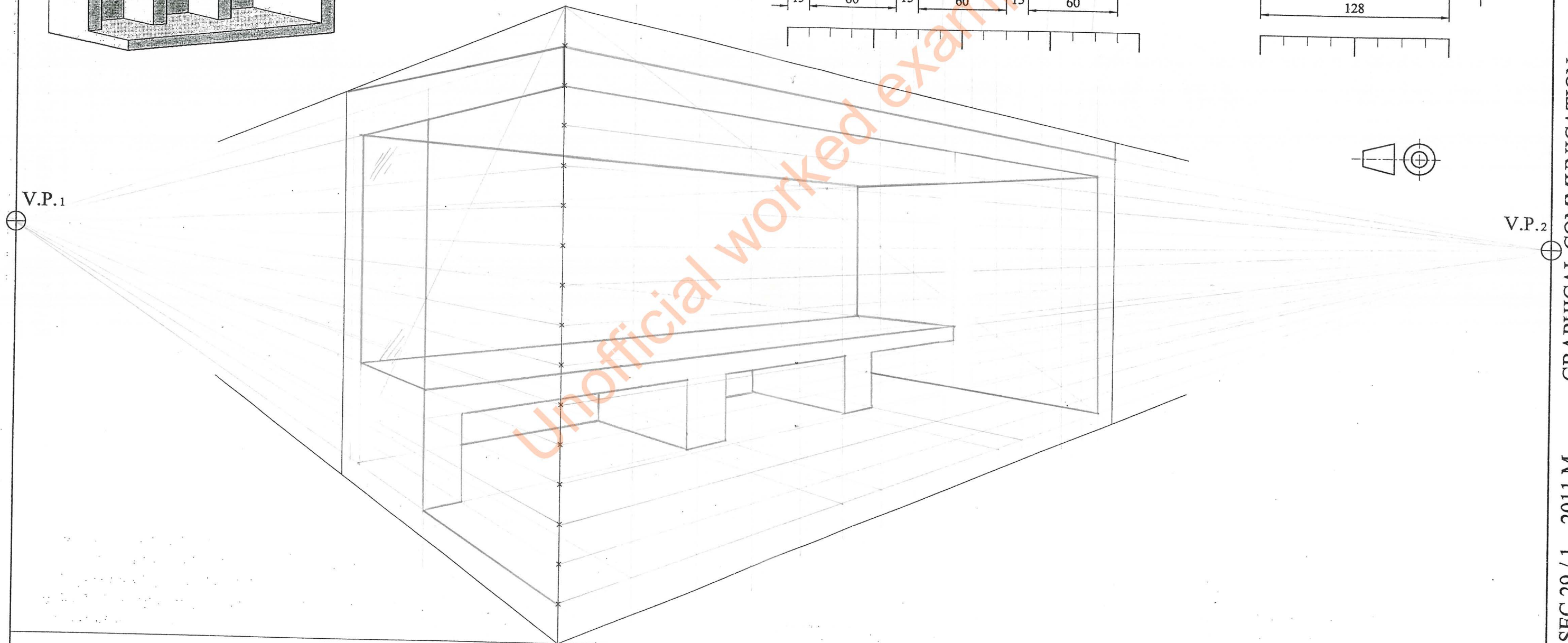
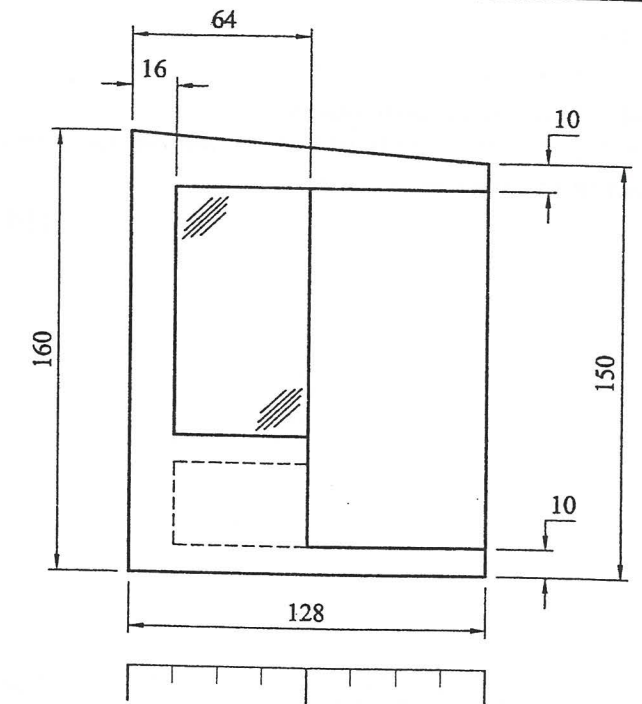
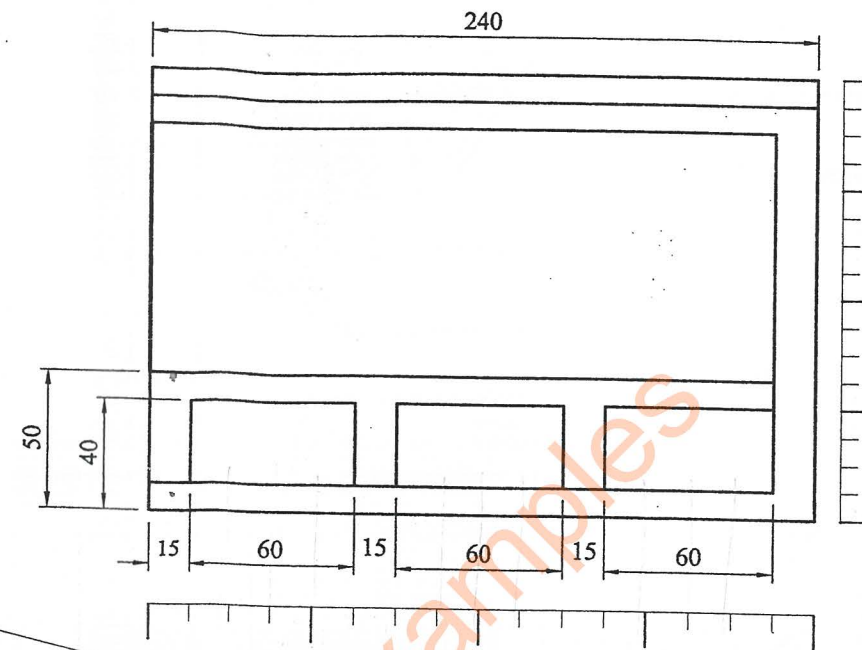
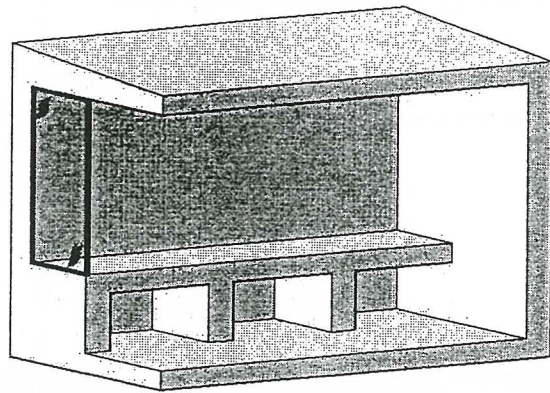
Question 7.

Two orthographic views and a pictorial diagram of a model bus shelter are shown.

Using the given vanishing points and start lines, construct a two-point estimated perspective view of the model.

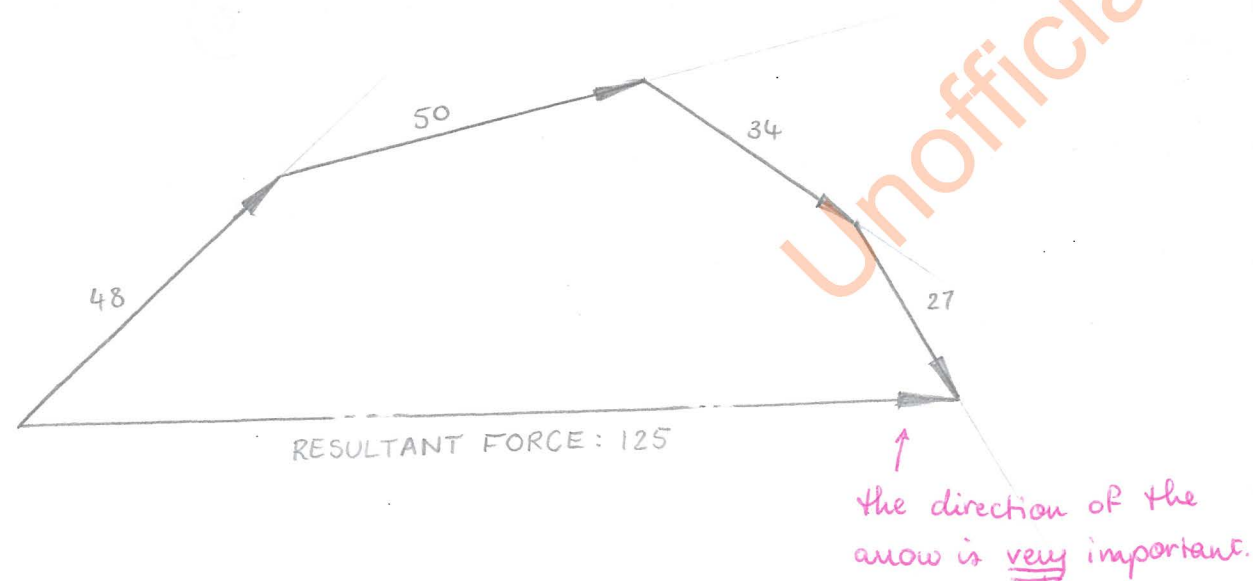
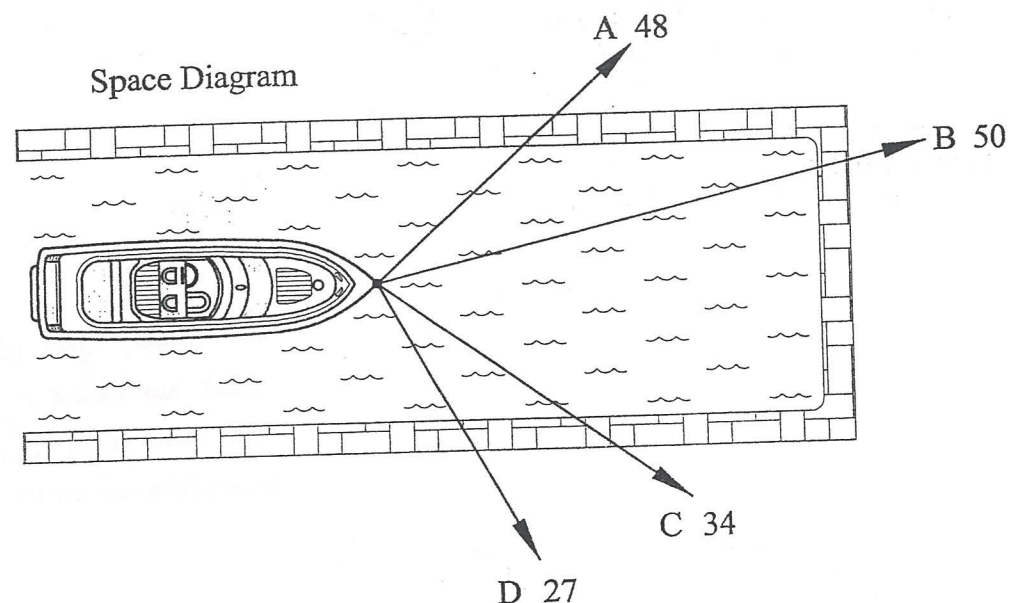
Leave all construction lines visible.

(18 marks)



Question 1.

A cabin cruiser is pulled inside a dock by means of four ropes A,B,C and D. The magnitude and direction of the forces are indicated in the space diagram. Using a scale of 10mm representing 10 units, draw a force diagram to find the magnitude and direction of the resultant force. Write down your answers in the spaces provided below. (10 marks)



Resultant is 125 units at 0 to the horizontal

Question 2.

The following computer programme is written to create a symbol for textile care labelling code. The symbol is to indicate the words, **must not be ironed**.

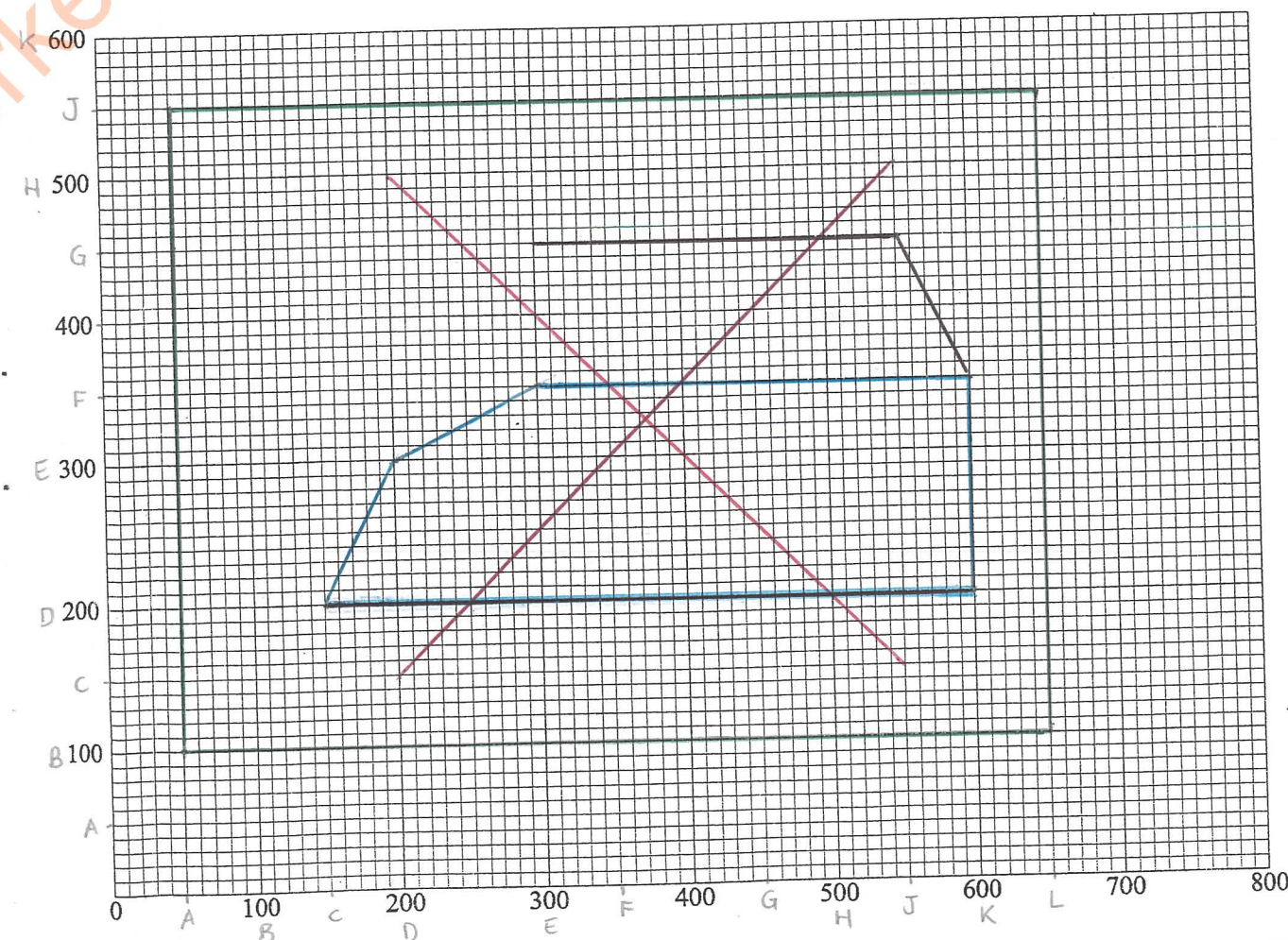
DATA: A = 50; B = 100; C = 150; D = 200; E = 300; F = 350; G = 450; H = 500; J = 550; K = 600; L = 650;
ACI 3: MOVE A,B; DRAW L,B; DRAW L,J; DRAW A,J; DRAW A,B;
ACI 5: MOVE C,D; DRAW K,D; DRAW K,F; DRAW E,F; DRAW D,E; DRAW C,D;
ACI 7: MOVE K,F; DRAW J,G; DRAW E,G;
ACI 1: MOVE D,C; DRAW J,H;
ACI 1: MOVE J, C; DRAW D,H.

The DATA statement assigns numeric values (in pixels) to variables. MOVE positions the cursor at a new location without drawing a line. DRAW draws a line from a current location to a new location. The instruction ACI No. makes the images that follow the instruction, appear in the colour associated by the number.

The computer responds to the following colour commands:

Colour	ACI No.
RED	1
GREEN	3
BLUE	5
BLACK	7

The starter sheet below shows a pre-printed grid representing an 800 x 600 graphical display. Use the grid to draw the image produced by this programme. (12 marks)



Question 3.

Loose/unconfined long hair can be dangerous when working with machinery. To address the issue, the management of an engineering firm decides to place a safety sign in the workshop to oblige the machine operators to wear caps to confine their hair.

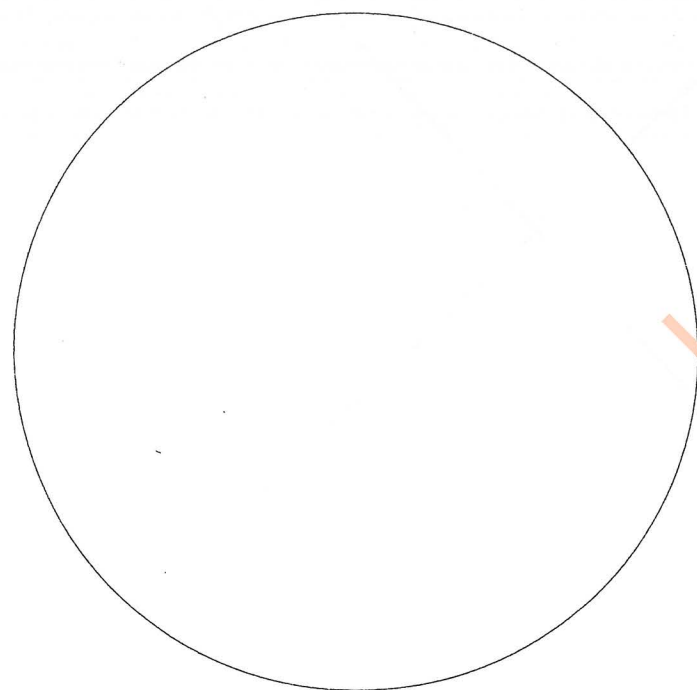
In the spaces provided below produce:

- preliminary sketch/es for the proposed sign;
- a final coloured design for the sign.

Note: The colours used must conform with those stipulated in the Health and Safety regulations.

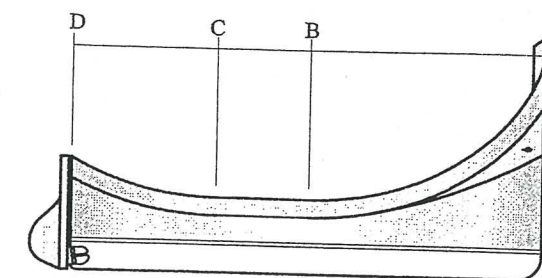
(12 marks)

Preliminary sketch/es



Question 4.

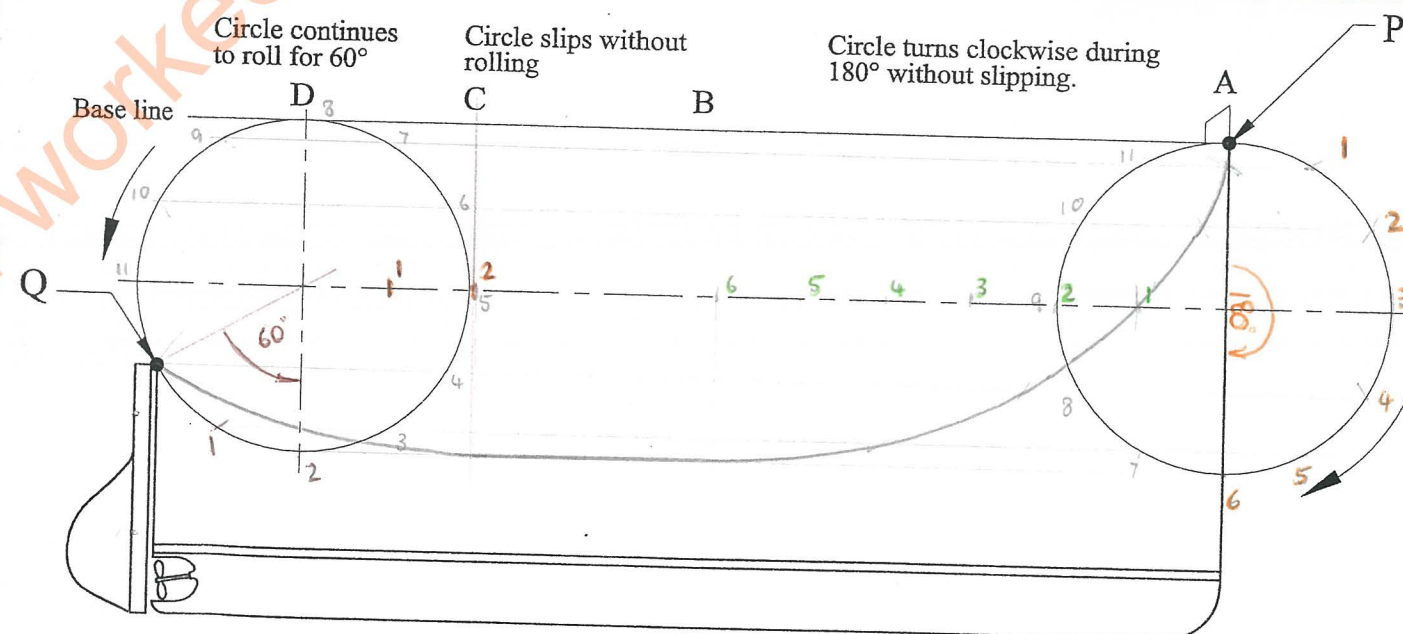
The profile of a Maltese Luzzu is shown on the right. An incomplete profile of the boat is given below. The missing top curve of the Luzzu, is in the form of two incomplete cycloids. These curves are formed by the two given generating circles.



On the given start lines:

- plot the locus of point P, as the circle rolls clockwise without slipping on the base line AD for 180° from point A to point B;
- plot the locus of the point Q as the circle rolls, anticlockwise for 60° , from point D to point C;
- complete the drawing by joining the two curves by a horizontal line.

(14 marks)



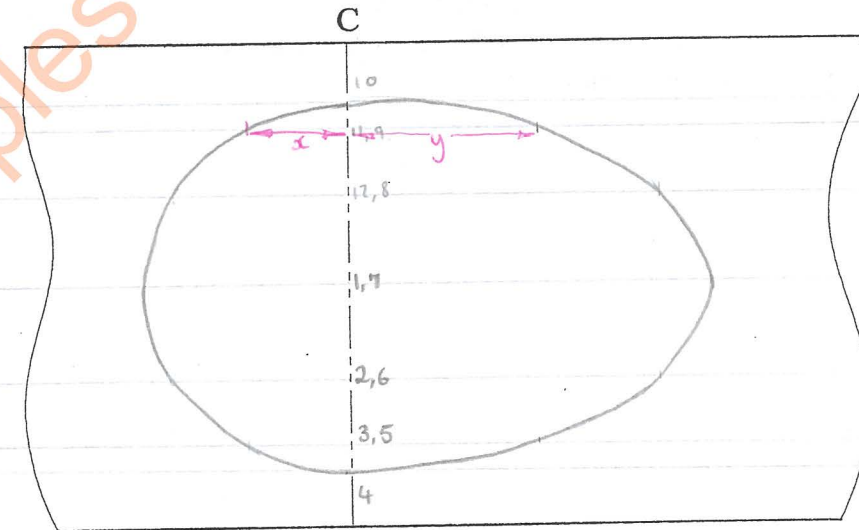
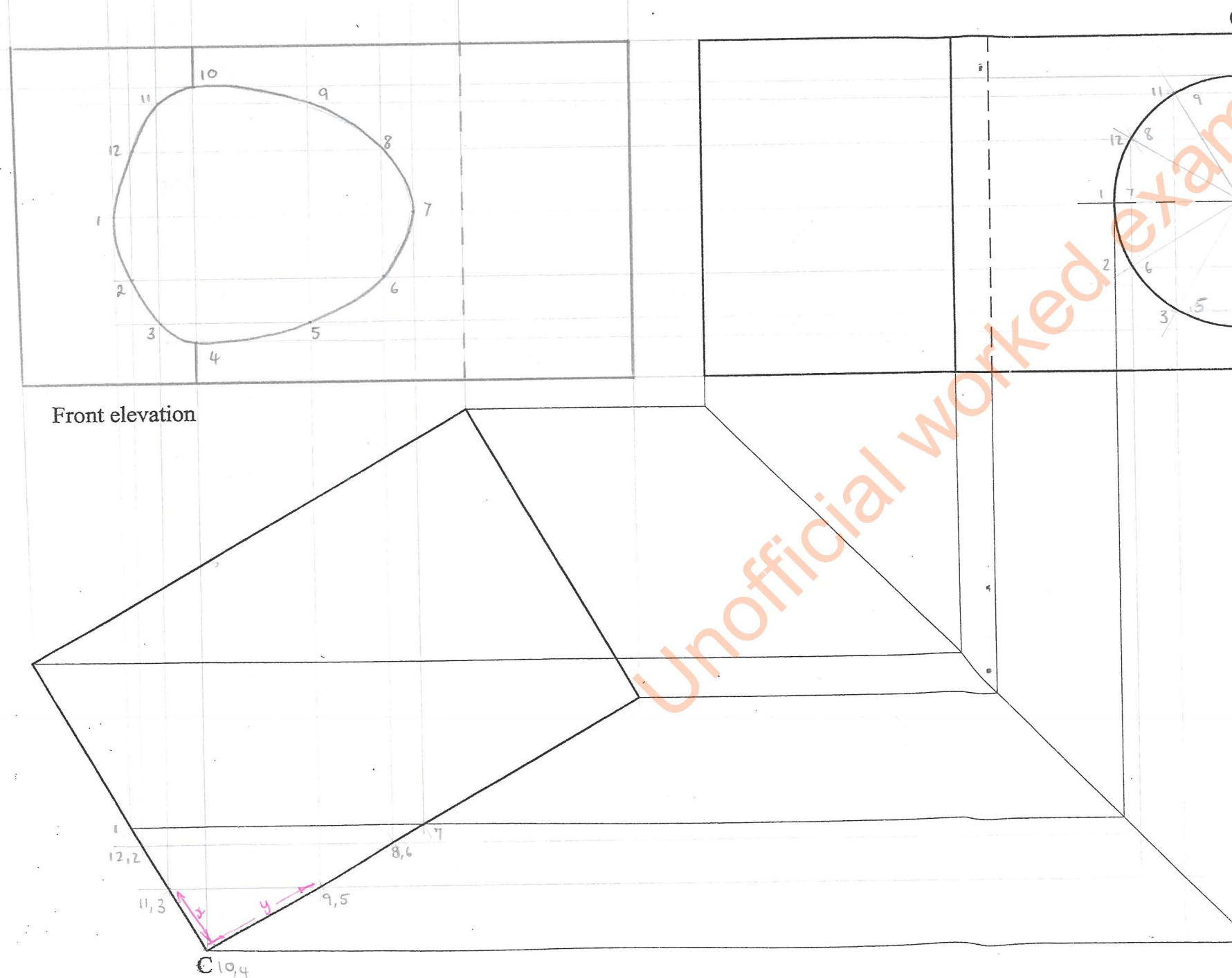
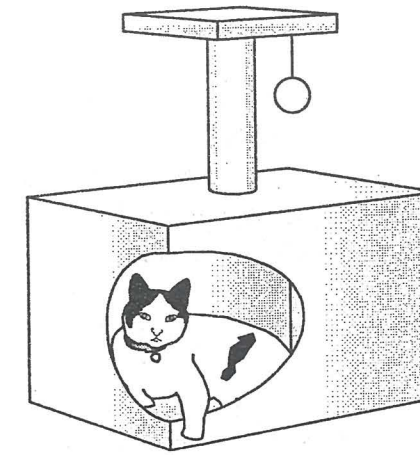
Question 5.

The pictorial sketch shows a cat's house which consists mainly of a plywood box which is pierced as shown. This opening serves as the entrance to the "cat's house".

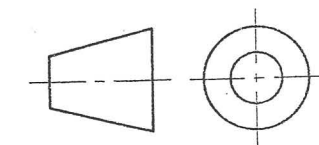
The complete plan and the end elevation of the pierced rectangular box are drawn below.

- Draw a complete front elevation, showing the shape of the pierced hole.
 - Construct a one piece surface development of the box, showing the pierced hole **only**.
- Show all necessary construction lines.

(16 marks)



Part development of hole/entrance



Question 6.

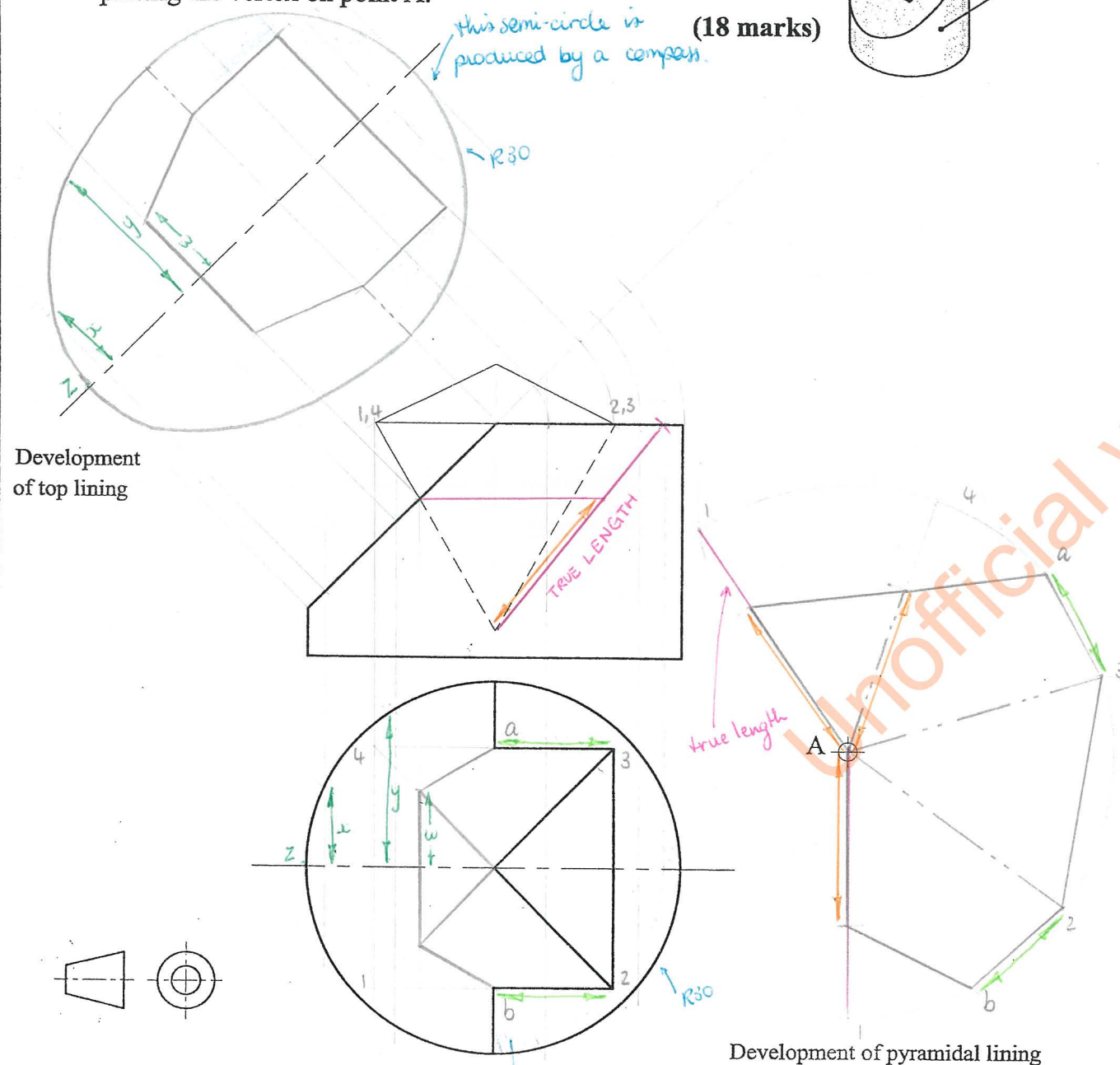
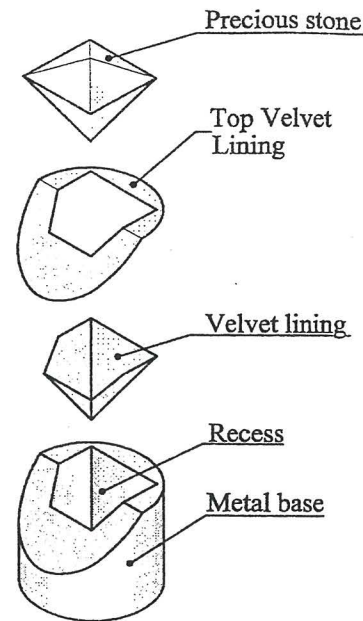
A precious stone, in the shape of a double pyramid shown on the right, is to be placed on display in a jewellery shop window. A cylindrical metal base with a pyramidal recess and a partially inclined top has been machined to accommodate the stone. Velvet linings are glued to the top of the metal base and to the pyramidal recess.

A front view and an incomplete plan of the metal base and pyramidal stone are given below.

Using the given elevations:

- complete the given plan view of the base (excluding the stone);
- draw the surface development of the top velvet lining;
- draw the surface development of the pyramidal velvet lining placing the vertex on point A.

(18 marks)



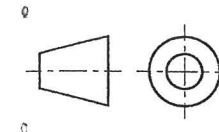
Question 7.

Two orthographic views of a decorative anchor are given below.

Draw an auxiliary view of the anchor as seen from the direction of arrow A.

Do not show any hidden details.

(18 marks)



I projected too many lines, the ones in blue were enough.

