

**Annual Examinations for Secondary Schools 2018**

**YEAR 10                              GRAPHICAL COMMUNICATION                              TIME: 2 hours**

**Instructions**

- Write your name and class on all sheets.
- Attempt ALL questions.
- All answers are to be drawn accurately with instruments, unless otherwise stated.
- All construction lines MUST be left on each solution to show the method employed.
- Drawing aids may be used.

**Information**

- All dimensions are in millimetres.
- Estimate any missing dimensions.
- Marks will be awarded for accuracy, clarity and appropriateness of construction.

**This section is for teachers' use only.**

Question	1	2	3	4	5	6	7	Total
Marks allotted	10	13	10	14	13	15	25	100
Marks awarded								

Question 1: Computer graphics.

You are required to draw an image using a computer graphics program which uses the instructions DATA, MOVE & DRAW to generate the image in the following way:

DATA: A = 50; B = 100; C = 150; D = 200; E = 250; F = 300; G = 350; H = 400; I = 450; J = 500; K = 550; L = 600; M = 650; N = 700; O = 750; P = 800.

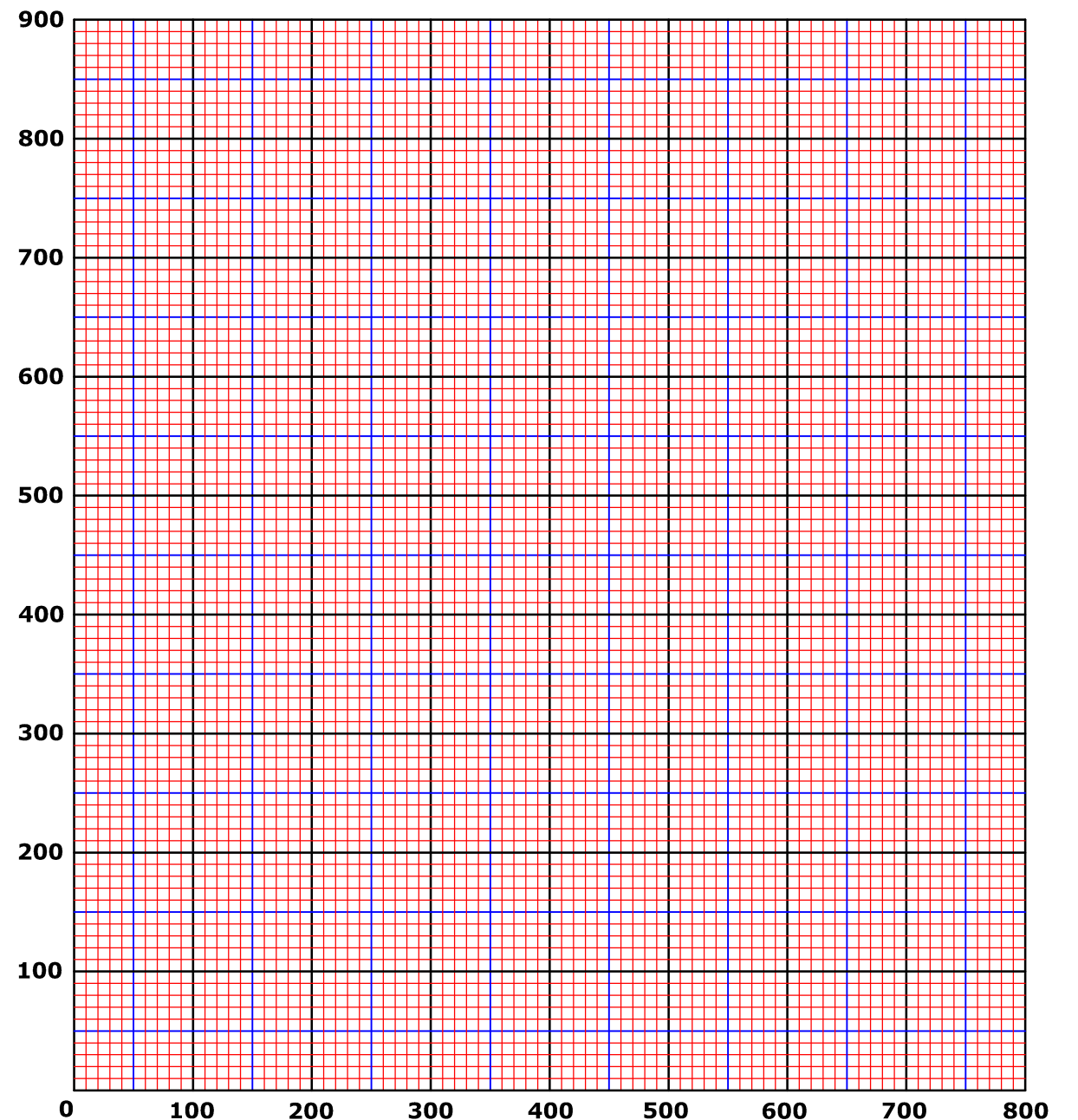
ACI 36: MOVE B,D; DRAW C,C; DRAW L,C; DRAW N,D; DRAW L,D:

ACI 36: MOVE F,C; DRAW F,B; DRAW I,B; DRAW J,C:

ACI 2: MOVE H,D; DRAW H,P; DRAW B,D; DRAW L,D; DRAW H,L.

The computer responds to the following commands:

Colour	(ACI) Colour Index Number	
2	Yellow	
36	Brown	(10 marks)

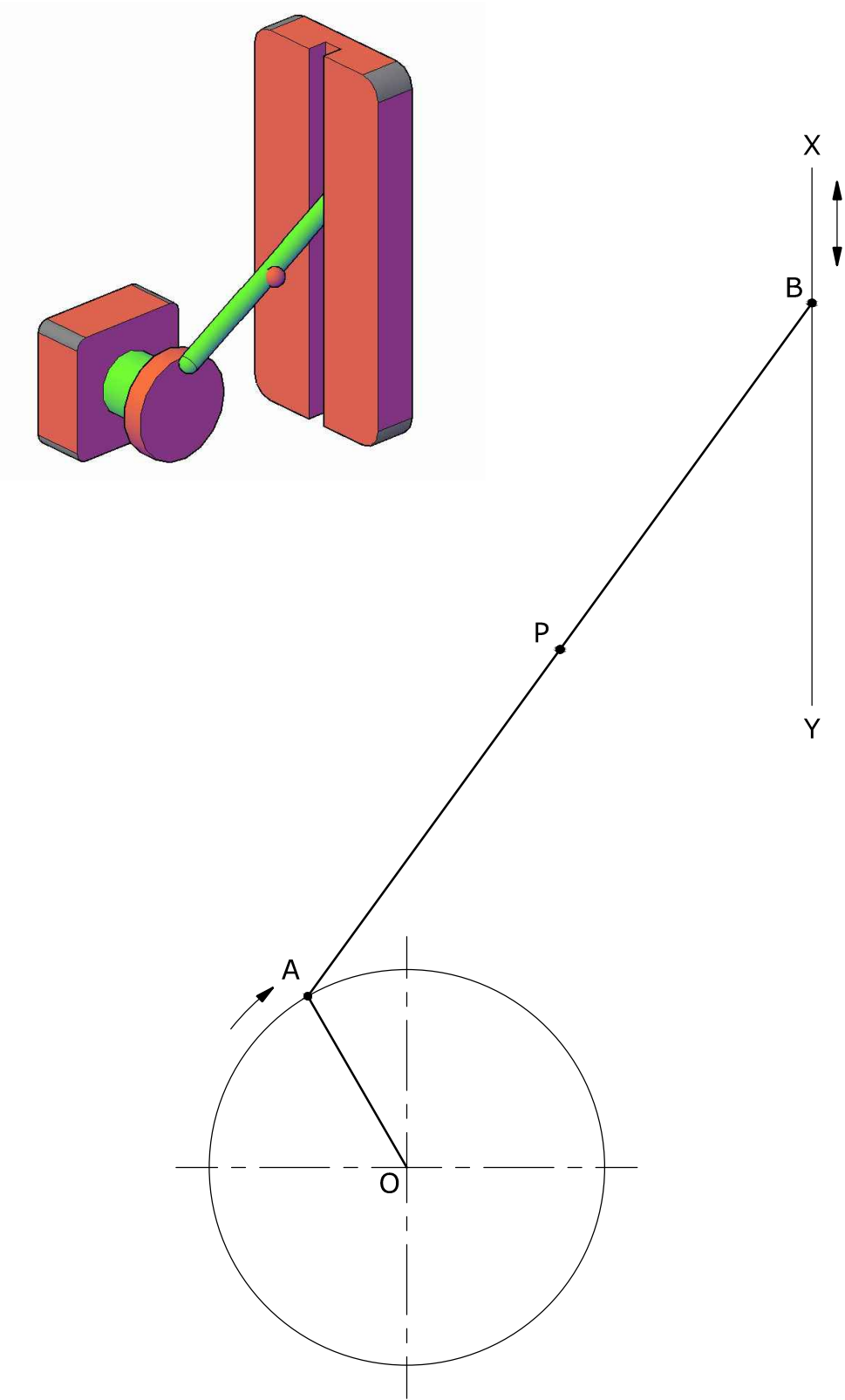


Question 2: Loci.

In the mechanism shown, crank **O-A** rotates about **O**. Link **A-B** is pivoted at **A** and **B** slides along the line **X-Y**.

Plot the locus of point **P** on the rod for one complete revolution of **A**.

(13 marks)



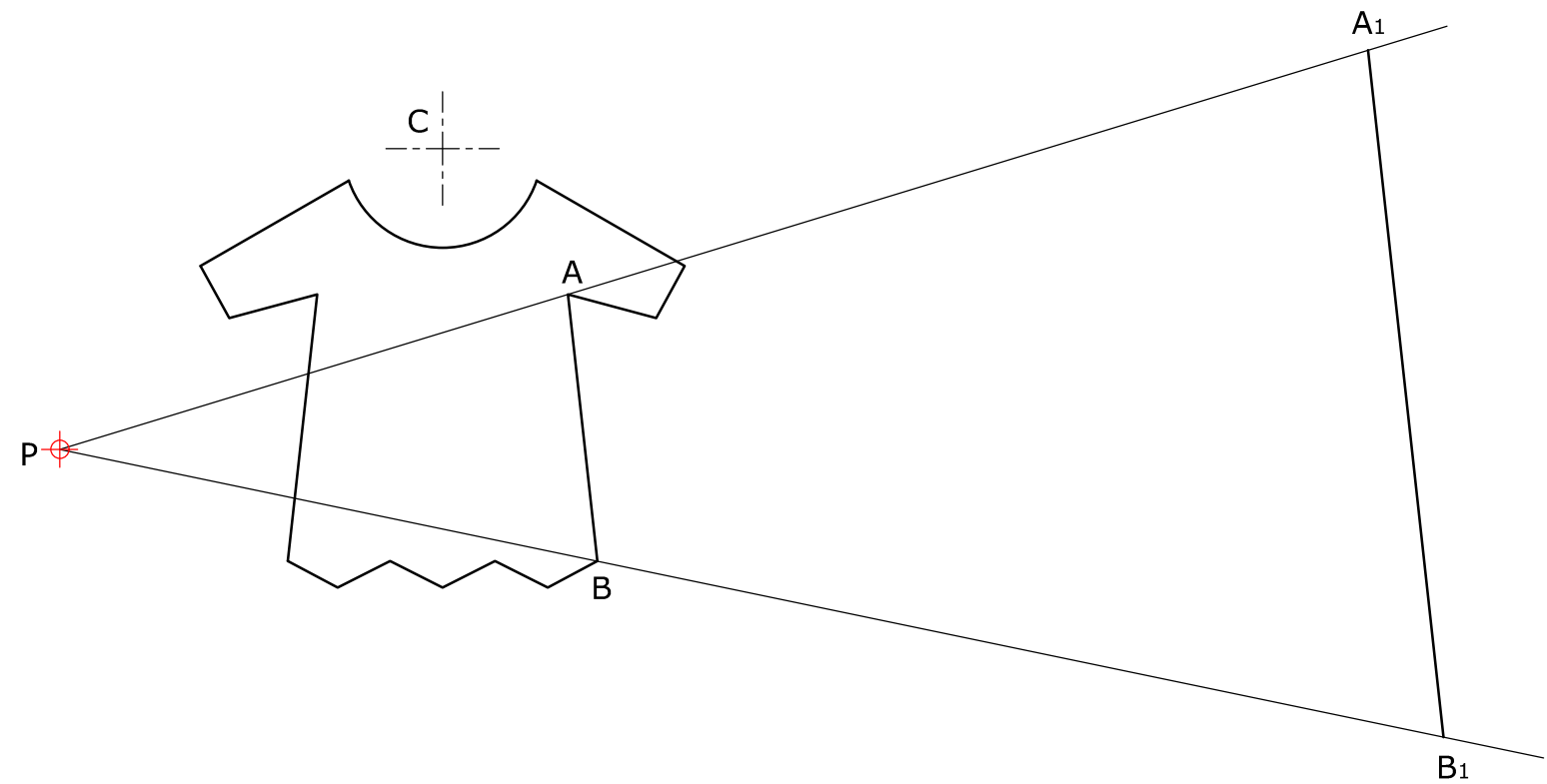
Question 3: Polar enlargement.

The drawing shows the profile of a female's top garment. Line **A-B** of the garment is enlarged to **A<sub>1</sub>-B<sub>1</sub>**.

Complete the enlargement proportionally, taking radial lines from pole **P**.

Notes: **C** is the centre of the arc.  
Two radial lines are already drawn.

(10 marks)

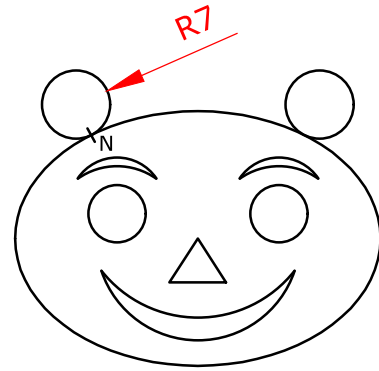


Question 4: The Ellipse.

The outer shape of the face shown on the right consists of an ellipse.

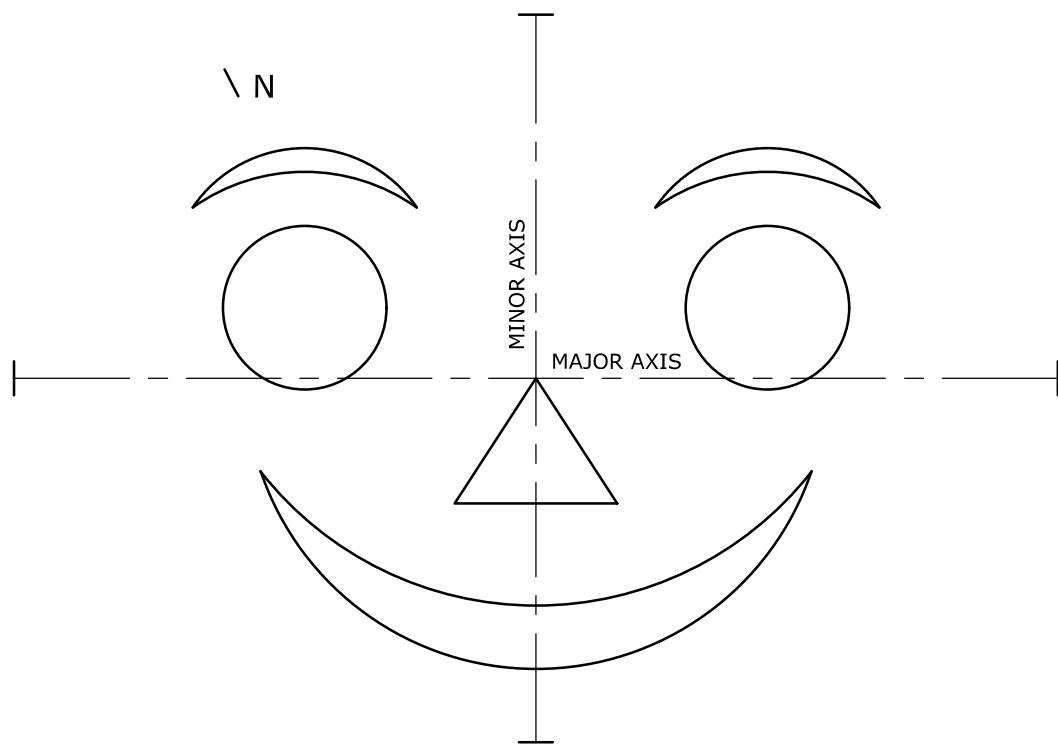
On the drawing started below, complete this face by:

1. constructing an ellipse on the given major and minor axes;
2. locating the two focal points of the ellipse;
3. constructing the Normal to the ellipse at point **N** and drawing the circular ear;
4. reflecting the Normal to the right-hand side and drawing the other ear.



Note: The trammel method of construction is not accepted.

(14 marks)

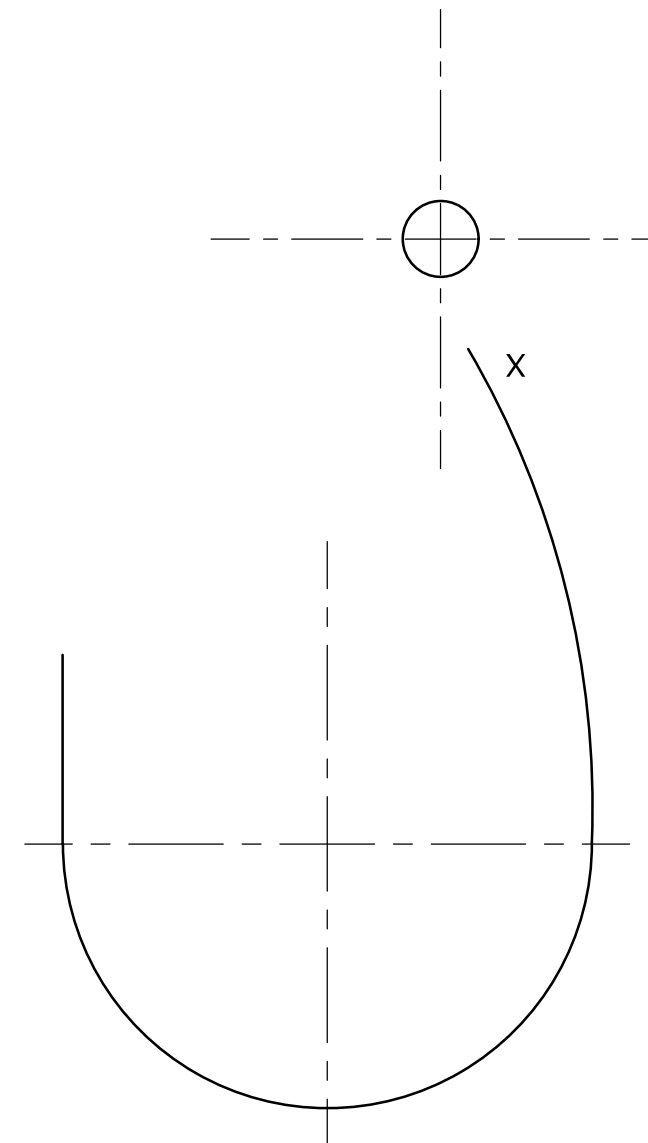
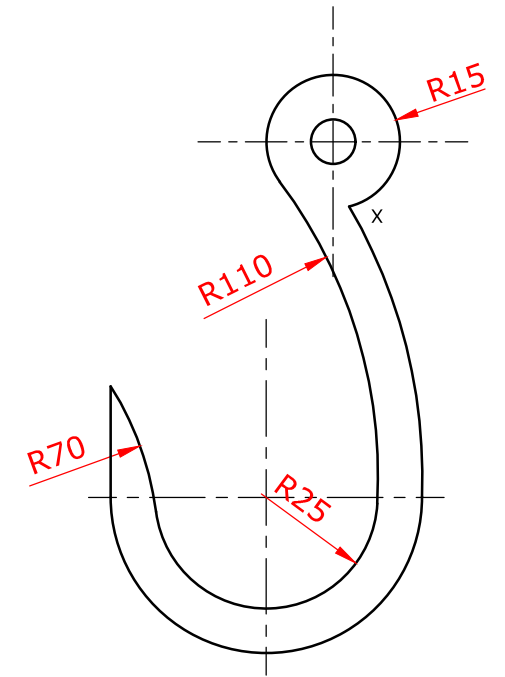


Question 5: Circles in contact.

The drawing on the right shows the outline of a steel hook used by butchers to hang pieces of fresh meat. On the starting lines given:

1. use the principles of circles / arcs in contact to reproduce the drawing. Show the construction necessary to find the centres and tangential points;
2. mark **TWO** points of tangency.

(13 marks)



Question 6: Helix.

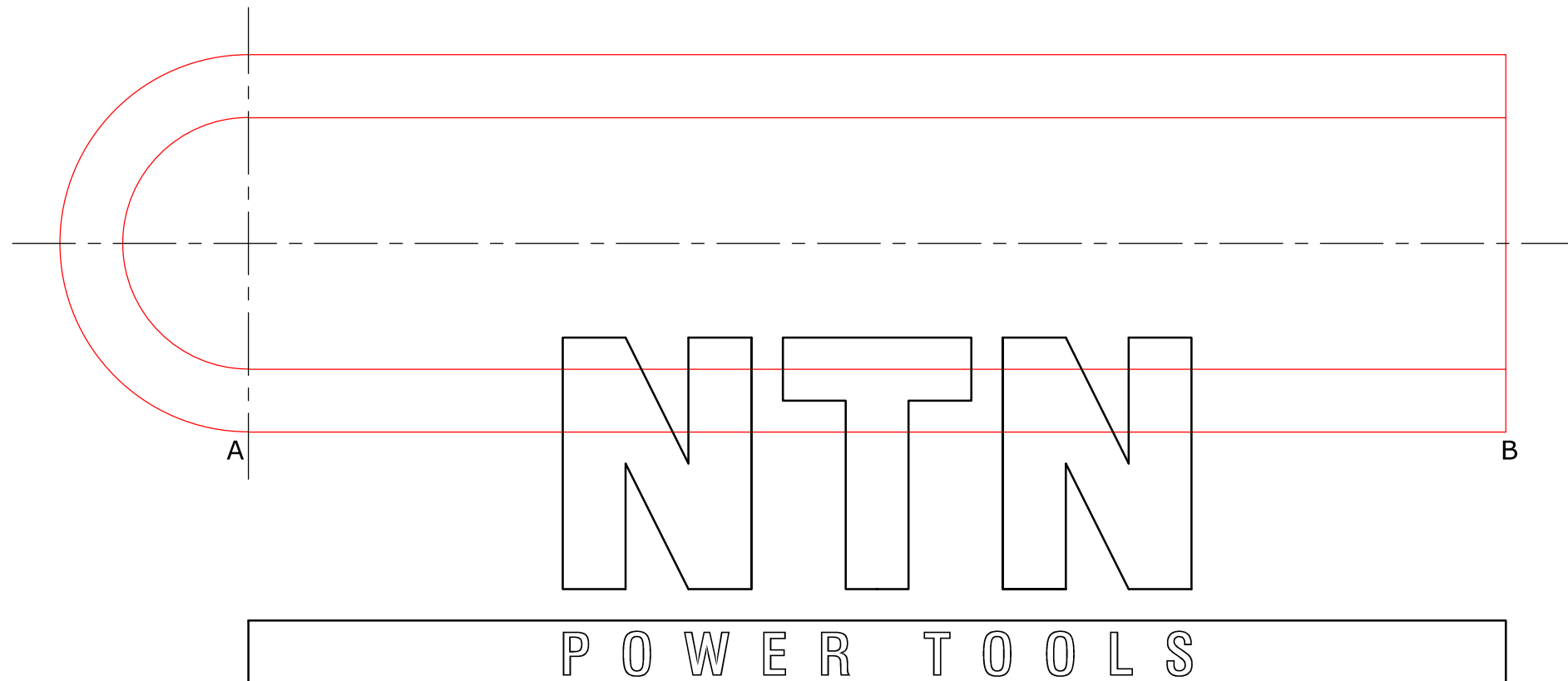
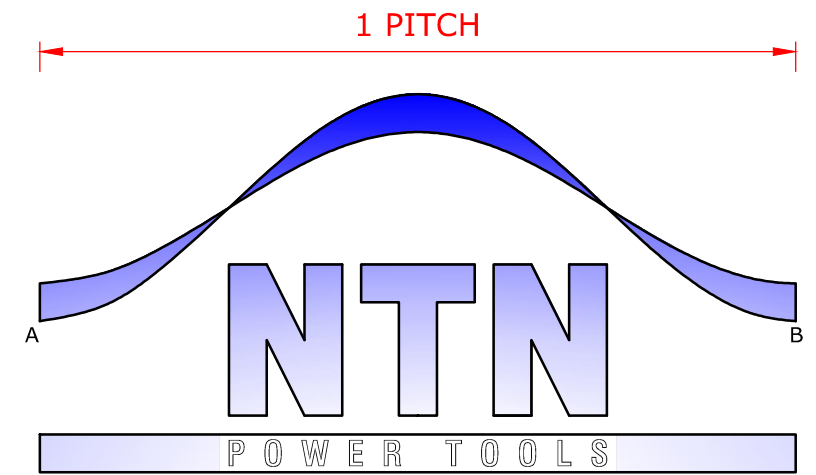
A company by the name of **NTN POWER TOOLS** has ordered a sign to be fixed on the entrance of its shops. The sign consists of a design formed by two helices having the same pitch but with different diameters.

Use the given starting lines to:

1. construct the two helices;
2. shade the entire drawing.

Note: Line **A-B** is 1 PITCH.

(15 marks)

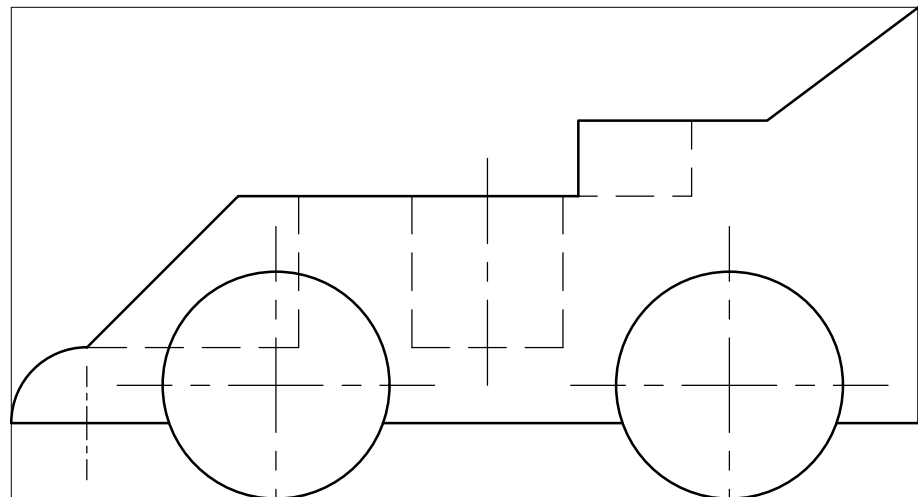


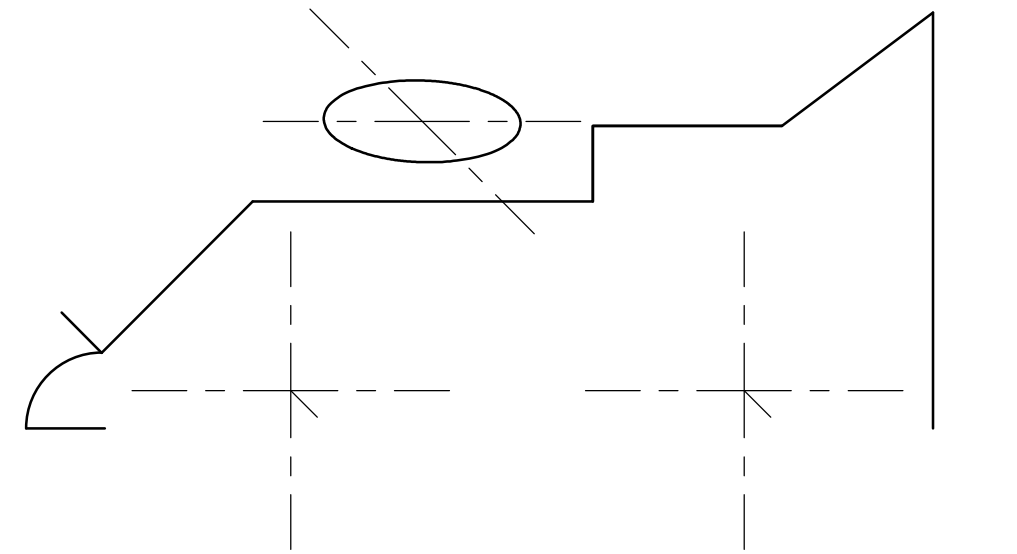
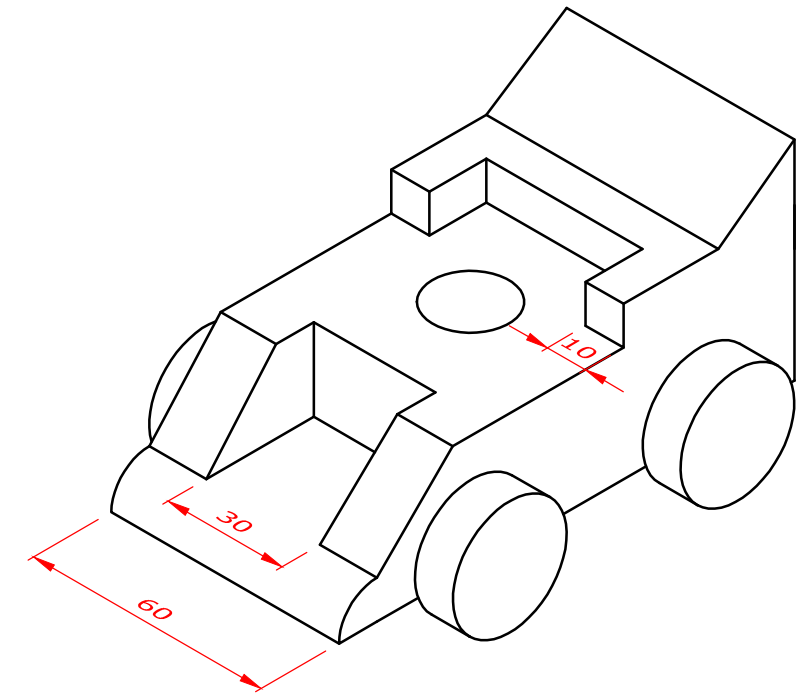
Question 7: Orthographic projection.

A pictorial **Isometric** drawing and a **FRONT** elevation of a wooden car are given.

1. Project the **END** elevation and **PLAN** in the spaces provided.
2. Complete the **Oblique** projection of the car using the given starting lines.
3. Draw the symbol of the projection used.

(25 marks)

 <p>FRONT ELEVATION</p>	
	<p>END ELEVATION</p>
<p>PLAN</p>	



SYMBOL