

Annual Examinations for Secondary Schools 2022

YEAR 9 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.

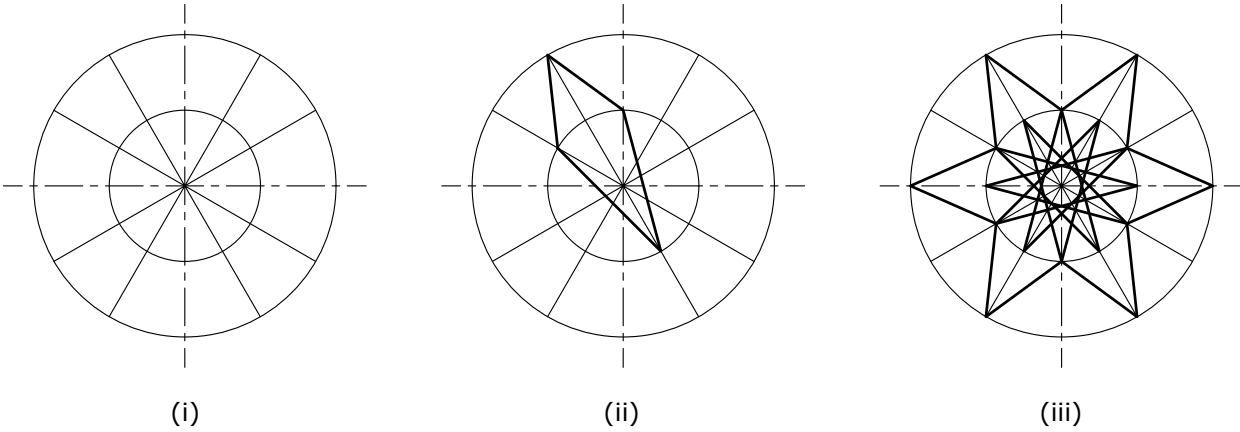
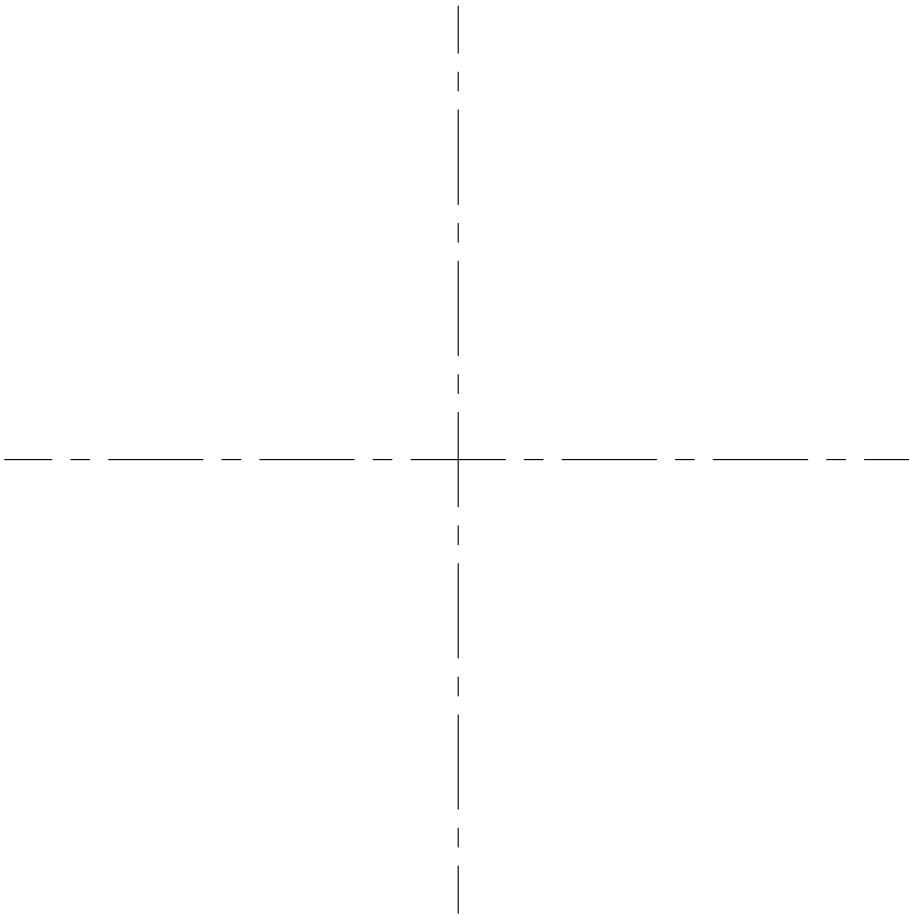
Question	1	2	3	4	5	6	Total
Marks allotted	12	18	15	18	17	20	100
Marks awarded							

Question 1: Geometry.

Three construction stages of a decoration star are given below.
Construct this design by following the given steps:

- a. Draw two circles of R25 and R50 on the given centre lines (i); (2)
- b. Divide the circles into 12 equal parts as shown in stage (i); (2)
- c. Draw the first part of the design as shown in stage (ii); (3)
- d. Complete the pattern as shown in stage (iii); (3)
- e. Outline the star as shown in stage (iii). (2)

(Total: 12 marks)

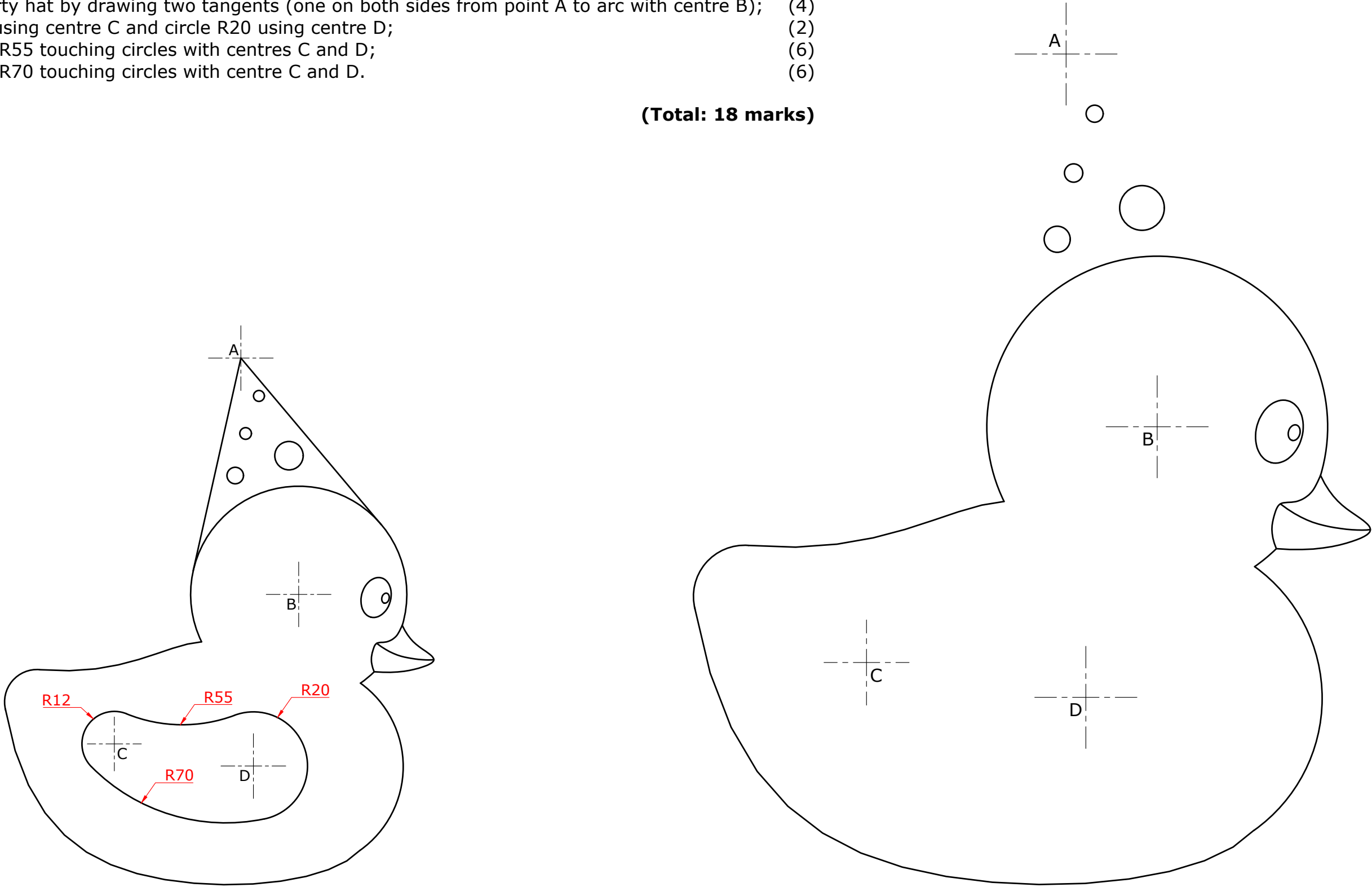


Question 2: Circles in contact.

The profile of a rubber duck wearing a party hat is given below.
Use the following instructions to complete the profile of the rubber duck:

- a. construct the party hat by drawing two tangents (one on both sides from point A to arc with centre B); (4)
- b. draw circle R12 using centre C and circle R20 using centre D; (2)
- c. construct an arc R55 touching circles with centres C and D; (6)
- d. construct an arc R70 touching circles with centre C and D. (6)

(Total: 18 marks)

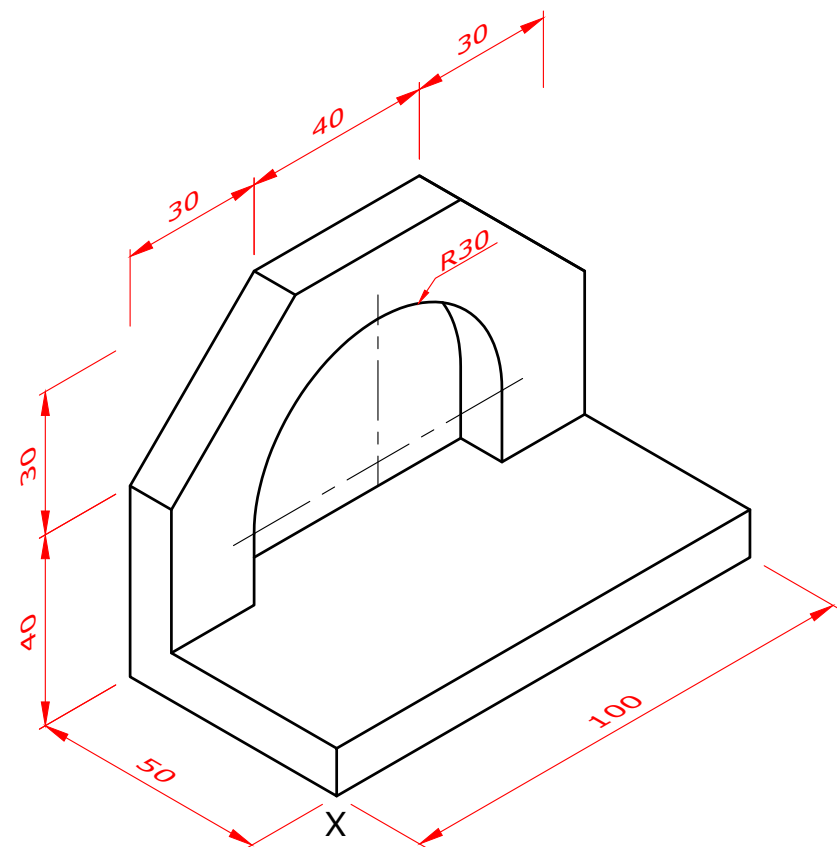


Question 3: Cabinet oblique projection.

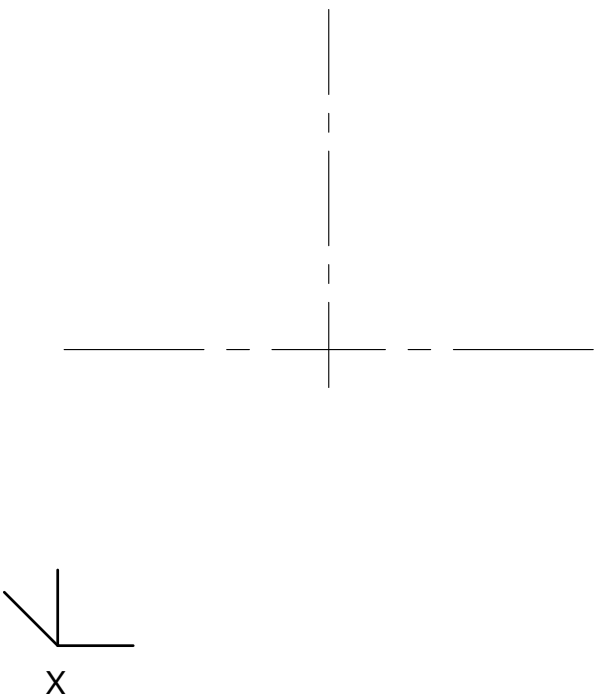
An isometric view of a metal bracket is given below. Draw the metal bracket in cabinet oblique projection on the given starting lines.
Place corner X on the left-hand side.

Note: Material thickness: 10mm throughout.

(Total: 15 marks)



Isometric view



Cabinet oblique projection

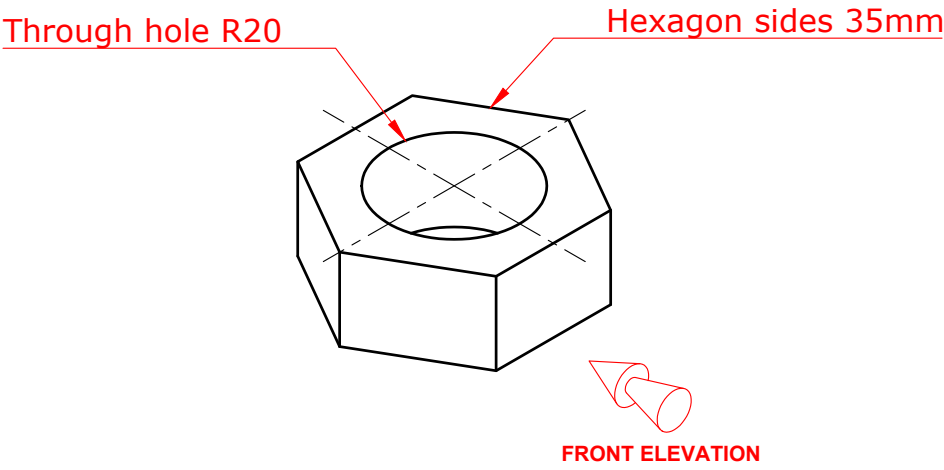
Question 4: Orthographic projection and isometric drawing.

A simplified isometric view of a steel nut is given on the right.
The front elevation, part of the plan and an incomplete isometric drawing are also given.

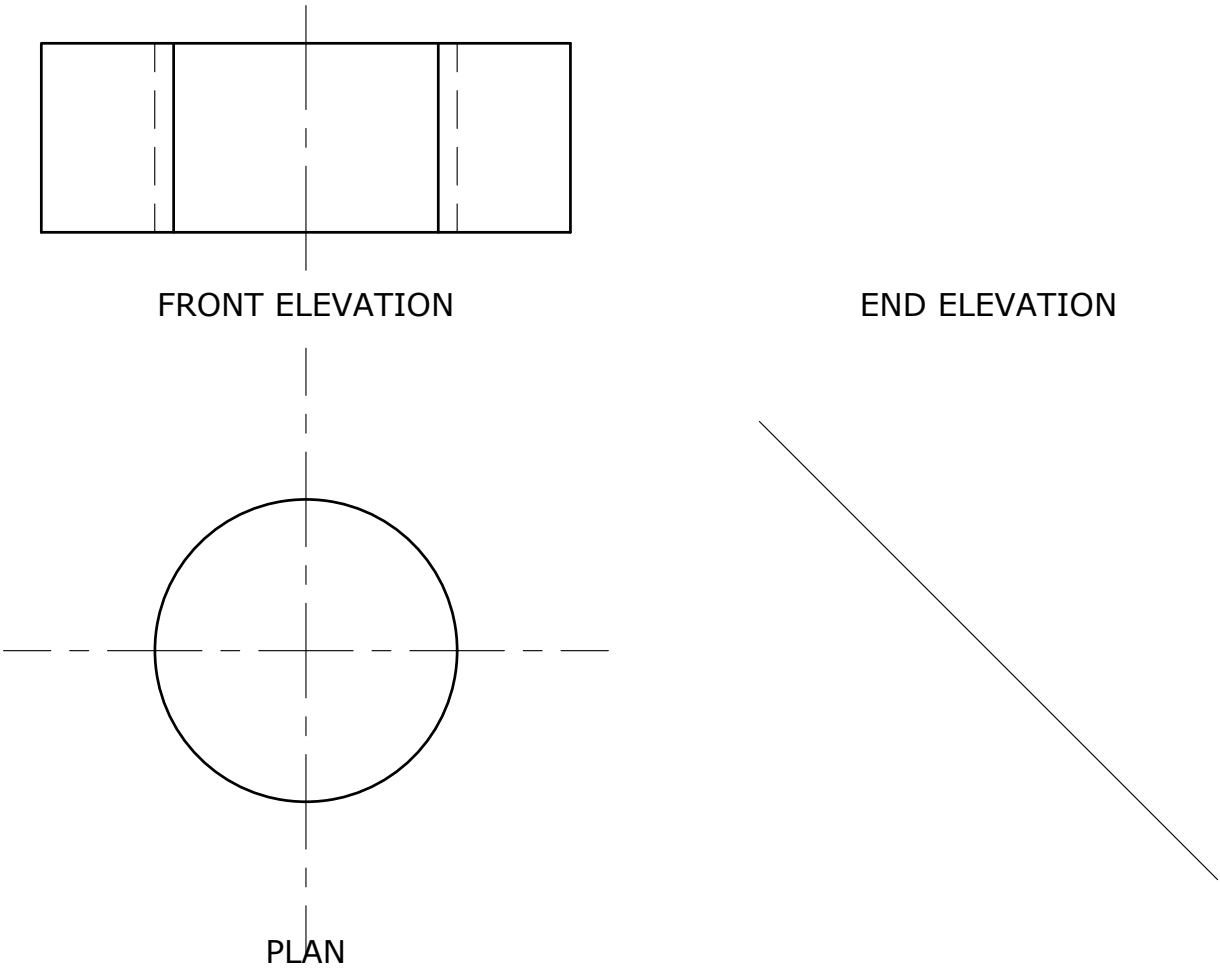
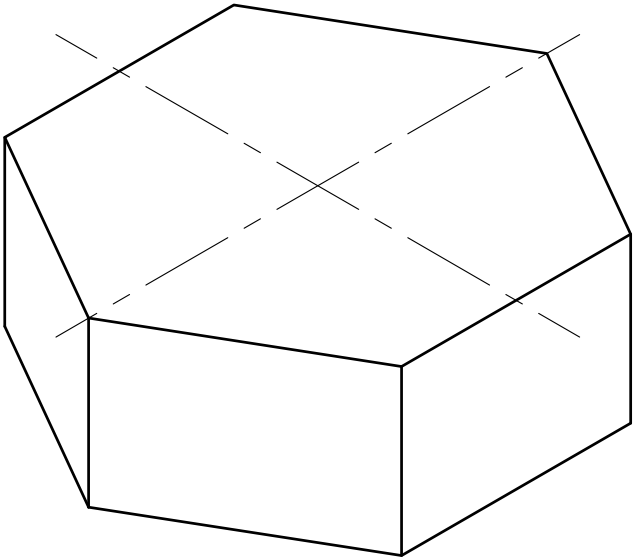
In the space provided:

- a. draw the hexagonal outline to complete the plan; (4)
- b. project the end elevation; (4)
- c. label the type of orthographic projection used; (2)
- d. complete the isometric drawing by constructing the through hole. (8)

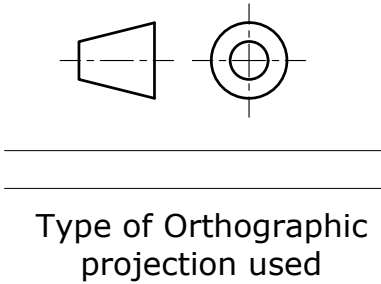
(Total: 18 marks)



Simplified isometric view



Incomplete isometric drawing

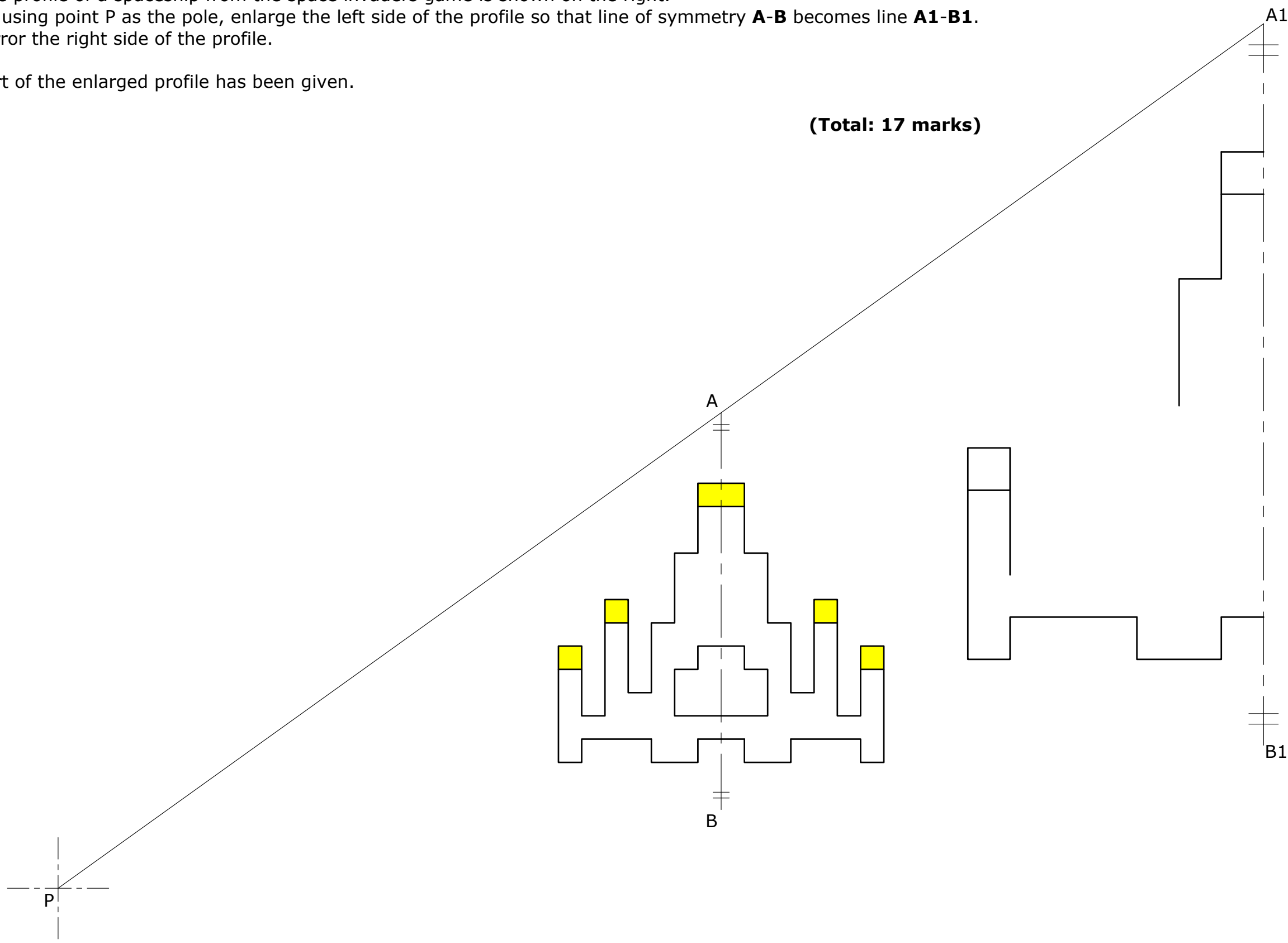


Question 5: Polar enlargement.

The profile of a spaceship from the space invaders game is shown on the right.
By using point P as the pole, enlarge the left side of the profile so that line of symmetry **A-B** becomes line **A1-B1**.
Mirror the right side of the profile.

Part of the enlarged profile has been given.

(Total: 17 marks)



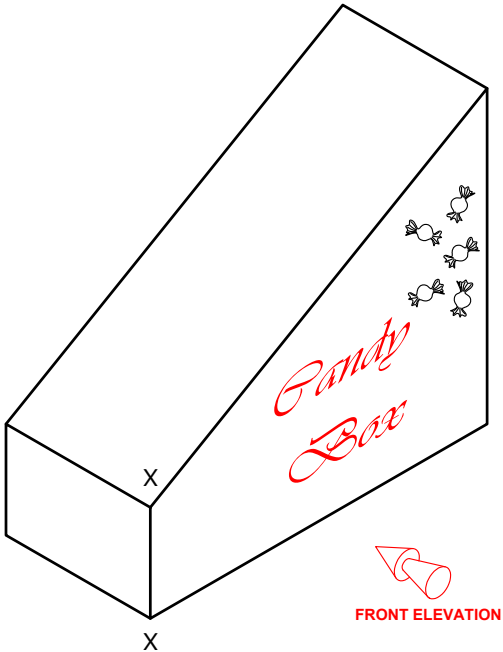
Question 6: Developments.

A candy package box in the form of a truncated rectangular prism is shown on the right.

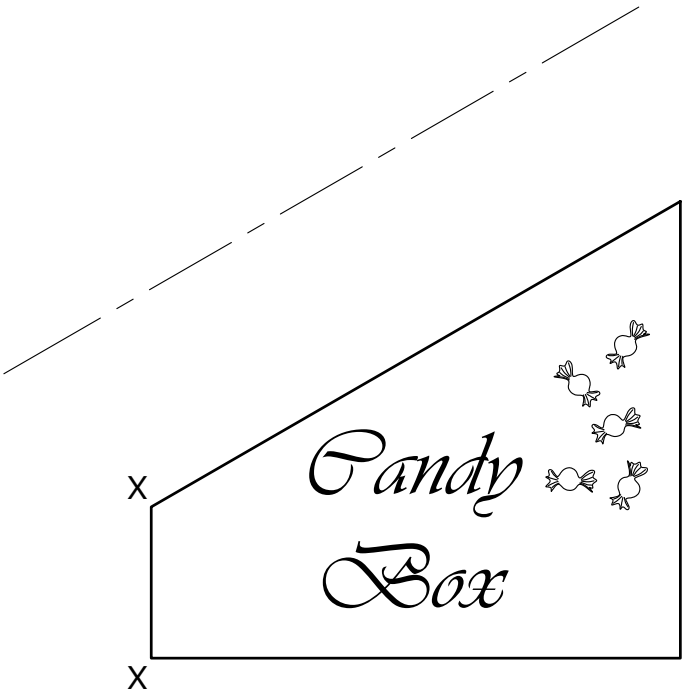
Complete the drawing by:

- a. projecting the end elevation of the package box; (4)
- b. constructing the true shape of the cut above the front elevation; (6)
- c. drawing the full development of the package box, taking the seam line at X-X including the top (true shape) and bottom (plan). (10)

(Total: 20 marks)

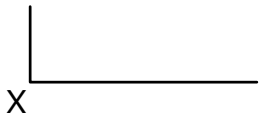


TRUE SHAPE

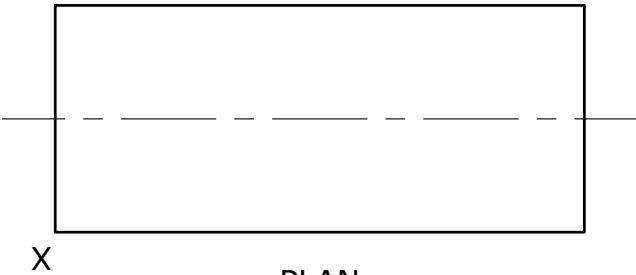


FRONT ELEVATION

END ELEVATION



FULL DEVELOPMENT



PLAN

