



SUBJECT: **Graphical Communication**
 PAPER NUMBER: I - Level 1 - 2 - 3
 DATE: 19th May 2025
 TIME: 2 hours 5 mins

General note: Clear and legible handwritten answers in pen or pencil are accepted where long answers are required.

1. Rebecca chose triangles as the theme for her first school-based assignment. With the help of her teacher, she outlined the following details:

Area/theme title: Create a design that is made up of several different triangles.

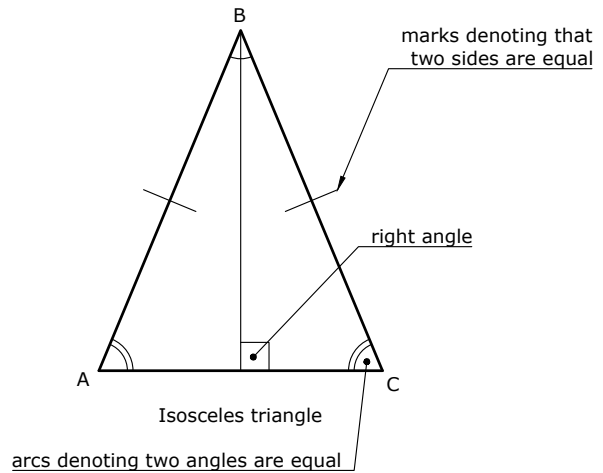
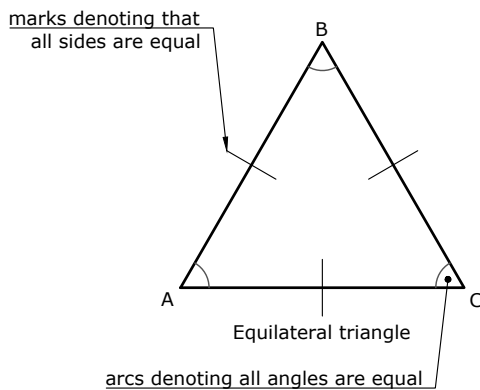
Related Lo's: By the end of this assignment, I will be able to:

- a. construct an equilateral, isosceles, scalene and right-angled triangles;
- b. construct basic triangles from given data;
- c. construct a triangle given the perimeter and the ratio of its sides.

Success criteria: The final design should:

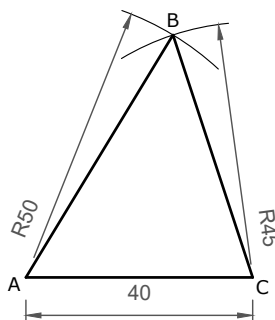
- 1. include two or more triangle types;
- 2. be an original design;
- 3. include some shading in colour using pencil colours.

Research and examples:

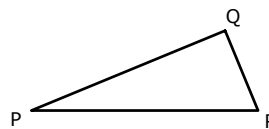


Constructing triangle ABC given the following data;
 AB = 50 mm, BC = 45 mm, AC = 40 mm.

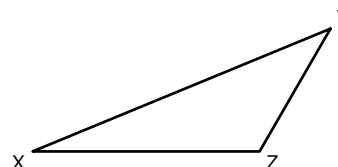
- Step 1: Draw horizontal line AC = 40 mm;
- Step 2: Draw an arc from A of 50 mm;
- Step 3: Draw an arc from C of 45 mm;
- Step 4: Outline triangle ABC in bold.



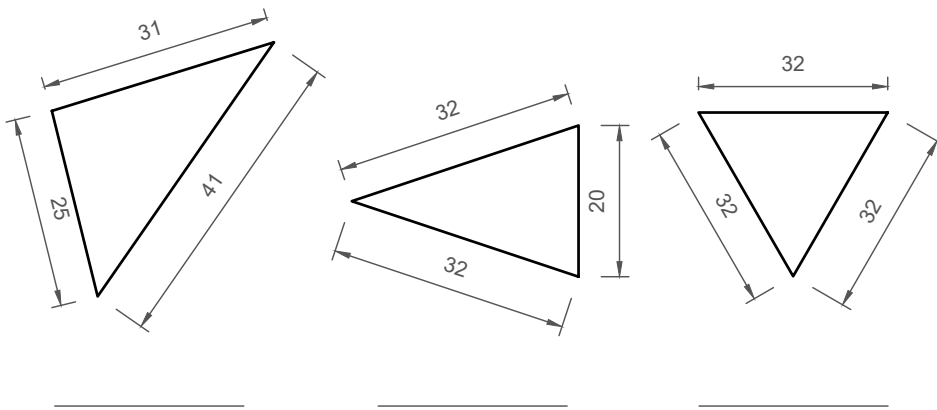
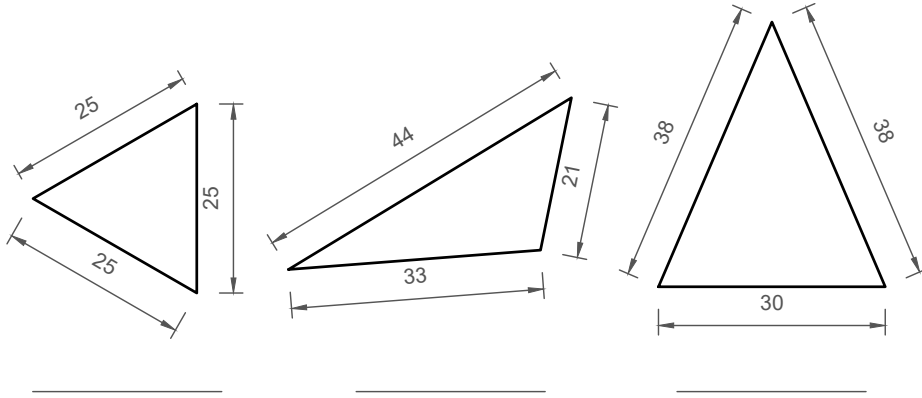
Triangle PQR is an acute triangle because all of its angles are less than 90°.



Triangle XYZ is an obtuse triangle because one angle is more than 90°.



a) Given the examples below, label the correct types of triangles by sides using either equilateral, isosceles or scalene. (3)



b) Indicate the following statements as TRUE / FALSE. (3)

- i) A triangle has 4 sides. TRUE / FALSE
- ii) The interior angles of a triangle make up 180° . TRUE / FALSE
- iii) A scalene triangle has no equal sides. TRUE / FALSE
- (iv) An obtuse triangle can have one of its interior angles 91° . TRUE / FALSE
- (v) An equilateral triangle has one right-angle interior angle. TRUE / FALSE
- (vi) We can construct a triangle given its perimeter and ratio of sides. TRUE / FALSE

c) In the space below and using your instruments, construct the following triangles given the data. (4)

- i. Triangle ABC having sides 50 mm.
- ii. Triangle PQR having a base of 70 mm and two base angles of 30° and 45° .
- iii. Triangle XYZ having a base of 60 mm, vertical height of 30 mm and one right angle.
- iv. Isosceles triangle DEF having a base of 40 mm and a vertical height of 52 mm.

A _____ C

P _____ R

X _____ Z

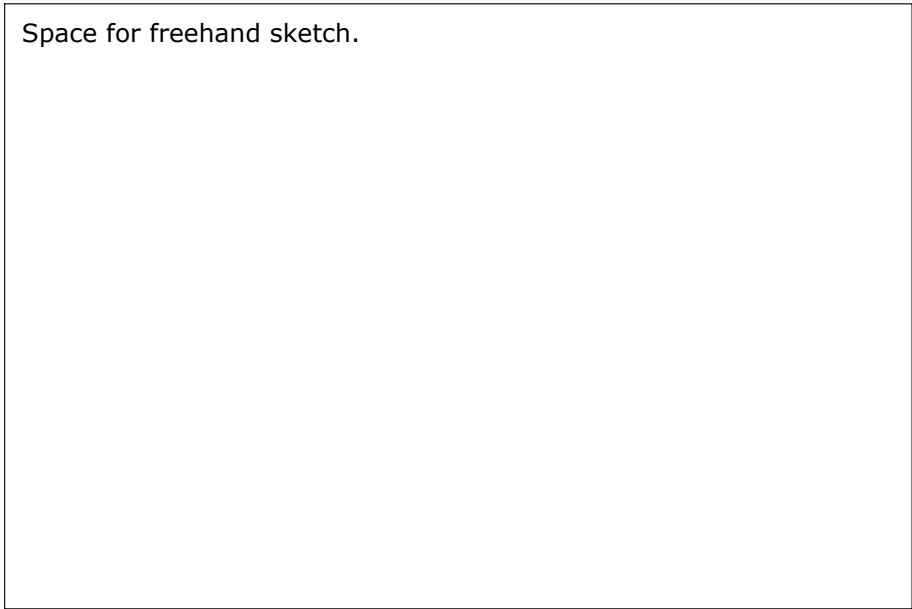
D _____ F

d) Using the perimeter JK given below and using instruments, construct a triangle having the ratio of the three sides as 3:4:5. (3)

J _____ K

- e) Draw a sketch, in freehand, of a design example that Rebecca could draw using at least **TWO** types of triangles mentioned in the assignment details. Use pencil colours to enhance your design. (2)

Space for freehand sketch.



- f) As for her final part, the teacher emphasised that Rebecca carry out a thorough self-evaluation of the project in a sincere and objective way. The teacher indicated that Rebecca needs to measure her assignment against the success criteria and indicate areas where she could modify her design and do better.

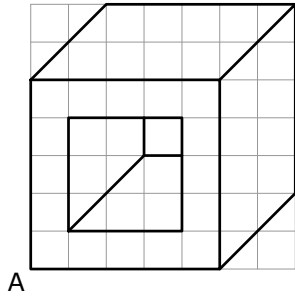
- i) Describe the importance of the self-evaluation in this context.

(2)

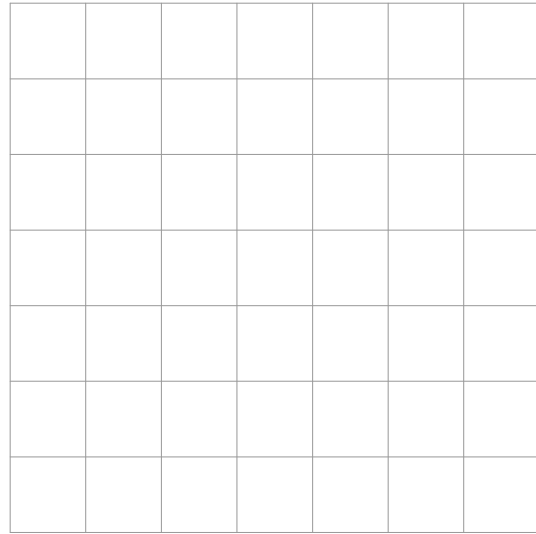
- ii) Indicate some areas of improvements in sketch 1(e).

(1)

2. a) A block in cabinet oblique is shown below. Using the dimensions given draw this block using the 10 mm square grid on the right. (2)

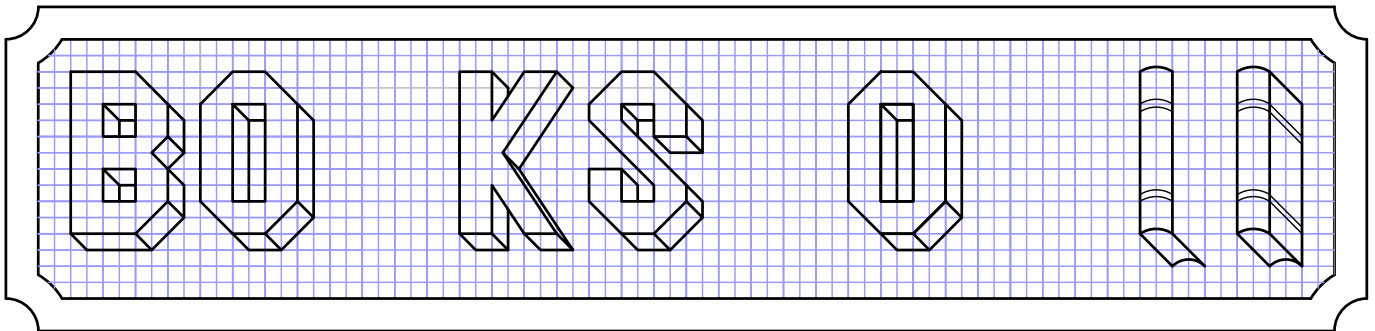
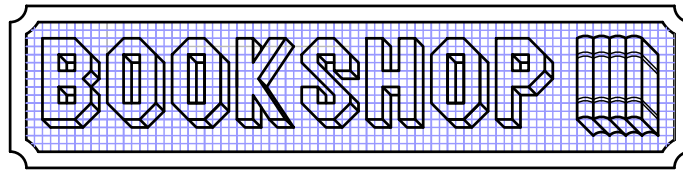


A



A

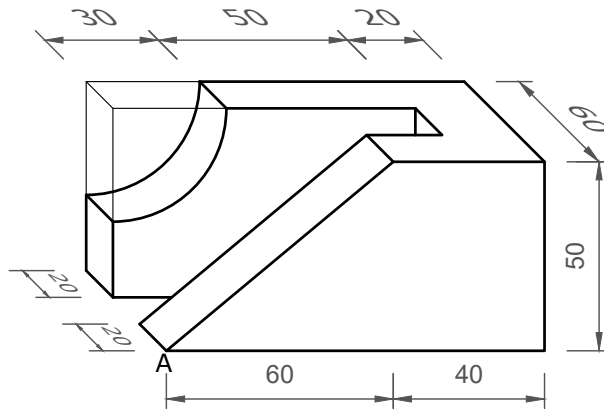
- b) A small vintage bookstore sign is given below. Using the given grids on the partially completed sign, draw the missing letters and books in cabinet oblique. (4)



- c) Explain cabinet oblique drawings in general, and a practical use in a typical school project.

(4)

- d) Use your instruments to turn the dimensioned cabinet oblique block given below into an isometric drawing. (8)



A

3. a) Underline the right answer inside the brackets: (6)

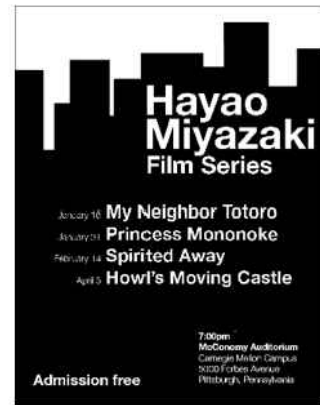
- i) Blue is a (warm / cold / lukewarm) colour.
- ii) Red is a (primary / secondary / tertiary) colour.
- iii) The mixture of blue and yellow pigment produces (orange / green / black).
- iv) Squares have (three / two / four) equal sides.
- v) The colour associated with 'safe condition' signs is (red / green / yellow).
- vi) The complementary colour of orange is (red / blue / violet).

b) Identify **TWO** visual principles for **each** picture from the following list. (6)

implied motion	balance	hierarchy	contrast	negative space	framing
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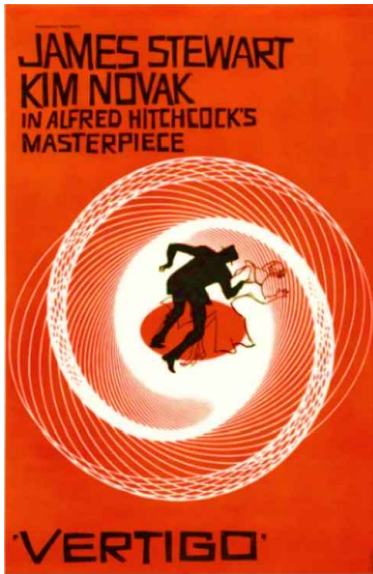






sources: <https://stagum.com/product/dancing-couple-wall-art/>
<https://www.vectorstock.com/royalty-free-vector/law-and-justice-balance-design-vector-8145527>
<https://aliciaiott.wordpress.com/typographic-hierarchy-poster-project/>
 AI created
<https://baileysmith628544120.wordpress.com/2019/11/04/framing-principles-of-graphic-design/>
<https://easy-peasy.ai/ai-image-generator/images/black-white-cat-high-contrast-2-color-monochromeesy.com>

c) Analyse the use and purpose of the following visual principles (hierarchy, implied motion, contrast) in the film poster below.



(3)

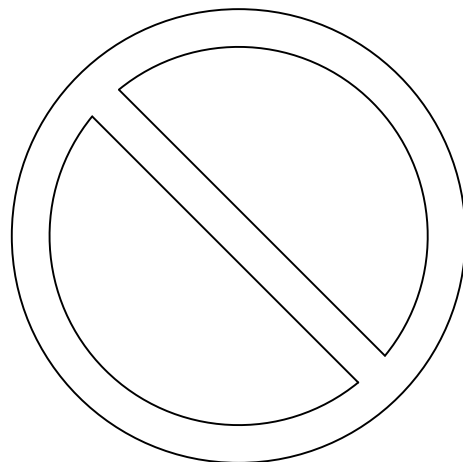
source: <https://filmartgallery.com/products/vertigo-5>

d) Briefly describe the difference between icons and symbols.

(2)

e) Design a prohibition sign where indicated, that will be placed in a public garden to prohibit people from picking up flowers. Draw at least **TWO** freehand preparatory sketches in the space provided. Colour your prohibition sign according to convention. (3)

Space for preparatory sketches



Prohibition sign

4. a) Define what is meant by 'vector' graphic.

(1)

b) Define what is meant by 'raster' graphic.

(1)

c) Identify **ONE** appropriate use for 'raster' and **ONE** for 'vector' graphics.

(4)

d) Describe the function of the following editing tools in an image editing software:

Crop tool: _____(1)

Brightness and contrast tool: _____(1)

Hue & saturation tool: _____(1)

e) Scamper is one of the idea generation techniques. State what the following letters in the 'scamper' acronym stand for.

S: _____(1)

M: _____(1)

E: _____(1)

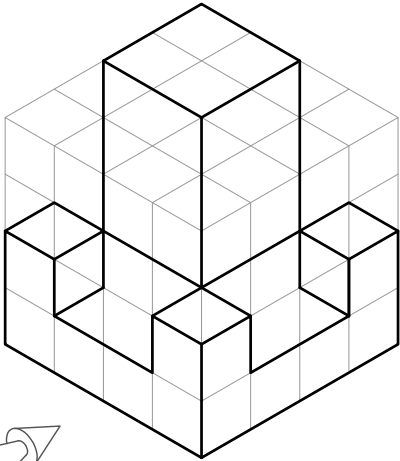
f) Mark, using a ✓ as 'TRUE' or 'FALSE' the following statements:

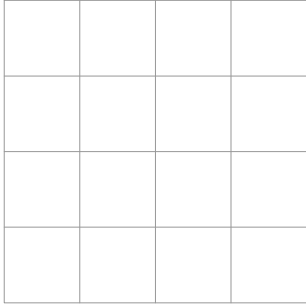
1. Adobe Photoshop is a vector drawing software.
2. A 'mind map' helps you find destinations around the Maltese islands.
3. The letter 'C' in the term 'SCAMPER' stands for 'combine'.
4. A logo serves to identify and promote a company product.

(2)

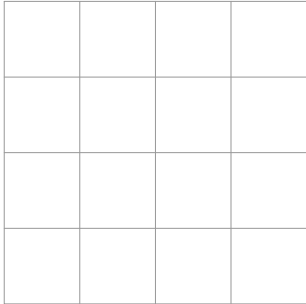
T	F

5. a) Using the given grids, draw the front elevation, end elevation and plan of the pictorial block below. Draw the orthographic projection in 3rd angle. (4)

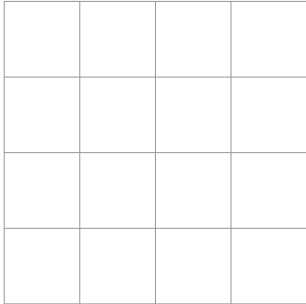




PLAN

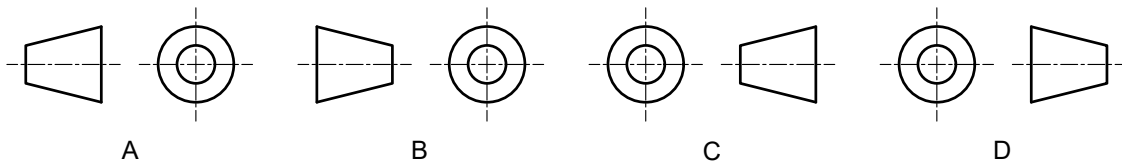


FRONT ELEVATION



END ELEVATION

- b) Circle the letter which corresponds to the third angle orthographic projection symbol. (1)



- c) Give **THREE** advantages for using CAD software.

(3)

d) Use the following computer programme to draw the design on the given grid. Mirror the plotted design using the vertical and horizontal centre lines as the mirror lines (lines of symmetry). (6)

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.

ACI 1: MOVE A,A; DRAW A,C; DRAW C,A; DRAW A,A:

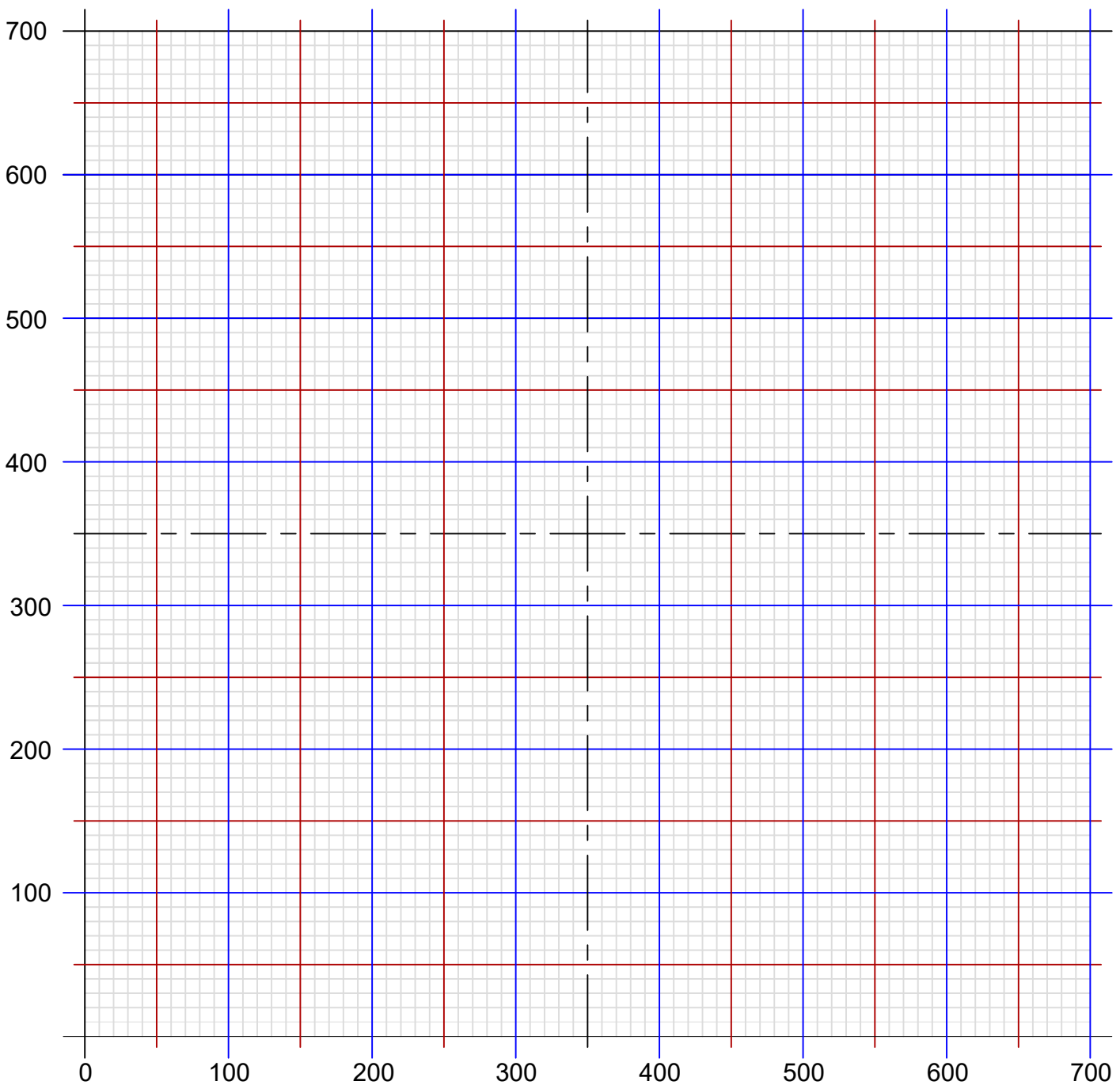
ACI 5: MOVE B,C; DRAW B,D; DRAW C,D; DRAW C,C; DRAW B,C:

ACI 3: MOVE E,B; DRAW D,C; DRAW E,D; DRAW F,C: DRAW E,B:

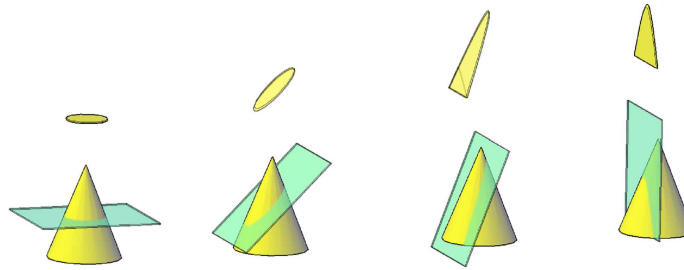
ACI 1: MOVE A,G; DRAW A,E; DRAW C,E; DRAW C,F: DRAW E,F; DRAW E,G:

ACI 5: MOVE G,E; DRAW F,E; DRAW F,G.

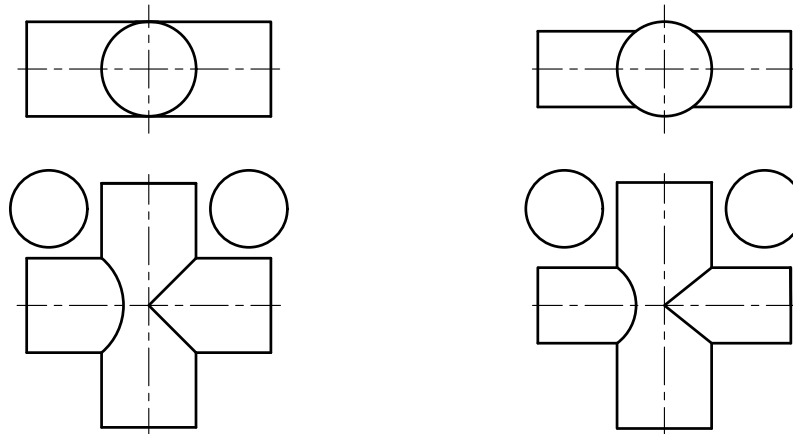
COLOUR	RED	BLUE	GREEN
ACI No.	1	5	3



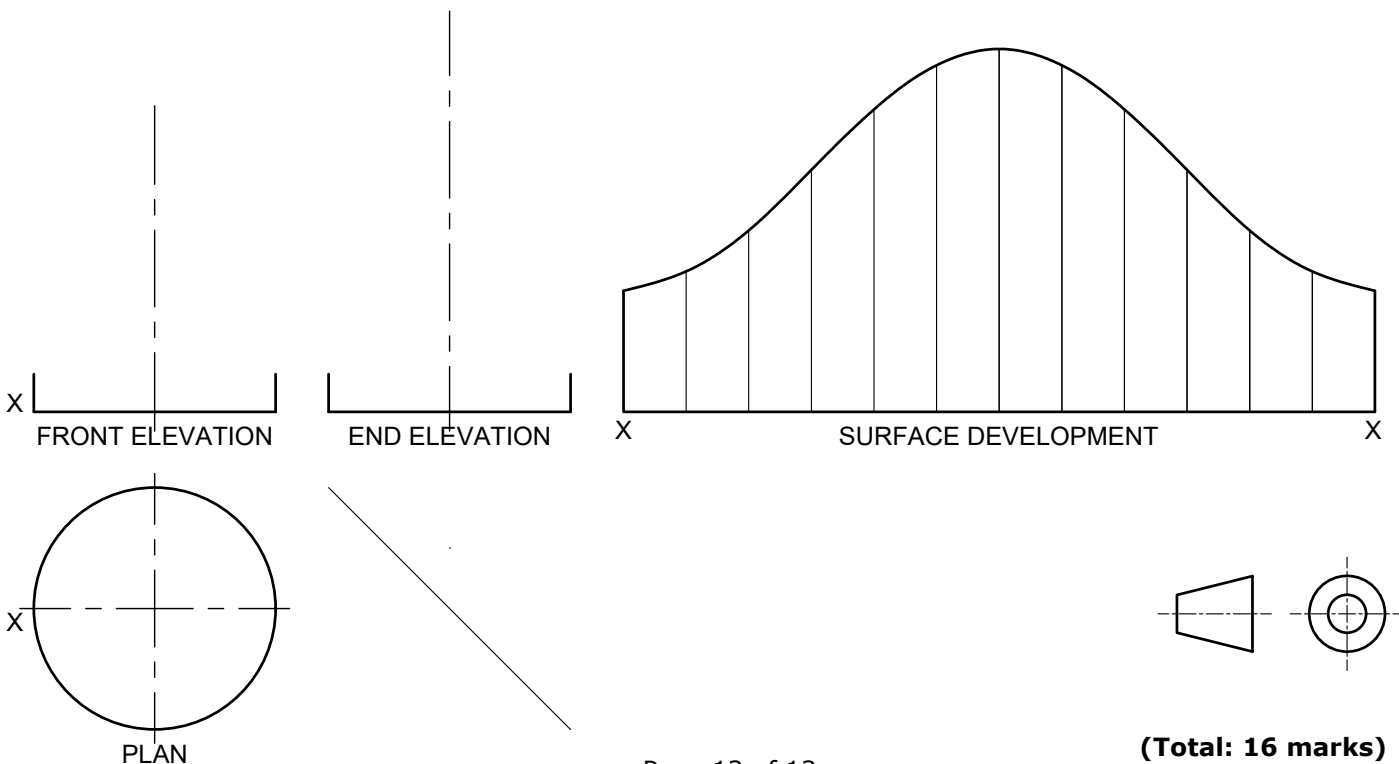
6. a) Identify the conic sections below by using these labels: hyperbola, circle, parabola, ellipse. (4)



b) Two examples of intersecting cylinders are given below in third angle orthographic projection. Both examples are cylinders whose axis intersect perpendicular and inline. The cylinders produce a seam of intersection where they meet. Indicate by means of a (✓) or (✗) the right and wrong seams of intersection. (4)



c) A partially drawn orthographic projection and a full surface development of a truncated solid are given below. Complete the front and the end elevations. (8)





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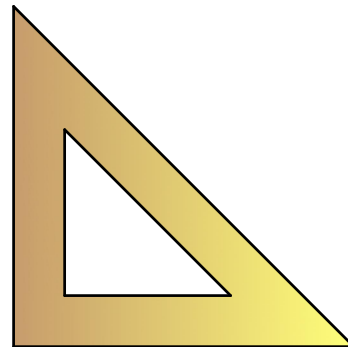
General note: Clear and legible handwritten answers in pen or pencil are accepted where long answers are required.

1. Label the following equipment using one of the following:
tee-square, compasses, ruler, 30° set-square, pencil, 45° set-square

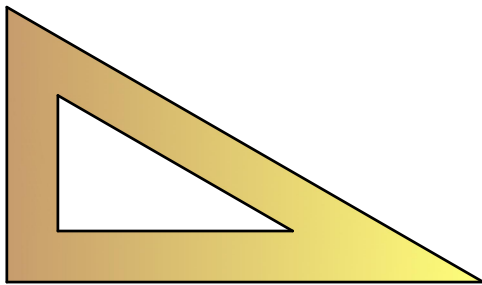
a)



b)



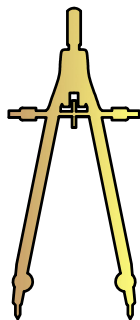
c)



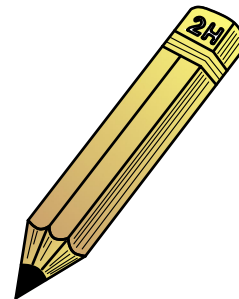
d)



e)

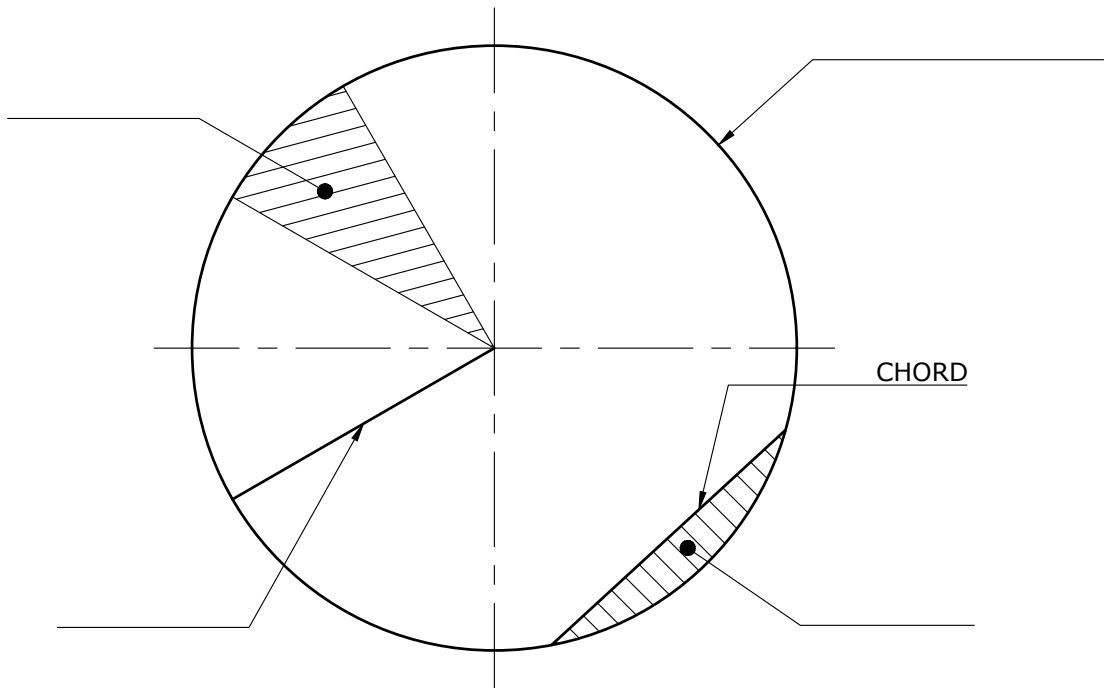


f)



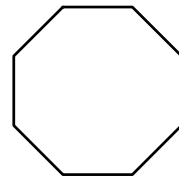
(Total: 3 marks)

2. a) Label the following parts of the circle. The first one has been given. (4)



- b) Match the following labels with the shapes. (4)

1. ISOSCELES TRIANGLE



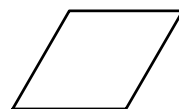
2. SQUARE



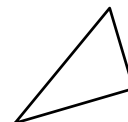
3. SCALENE TRIANGLE



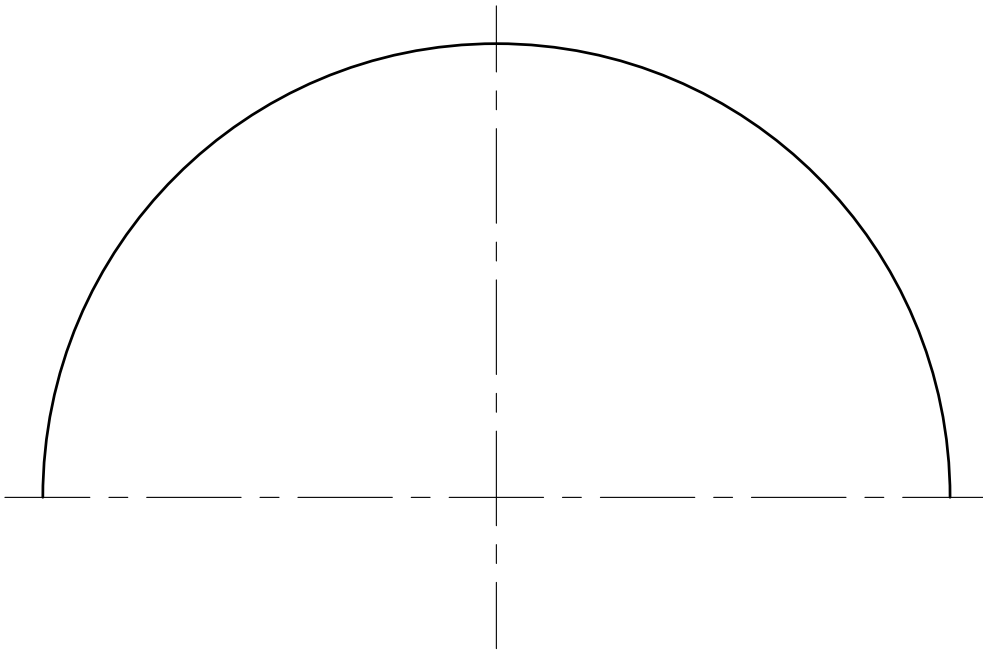
4. RHOMBUS



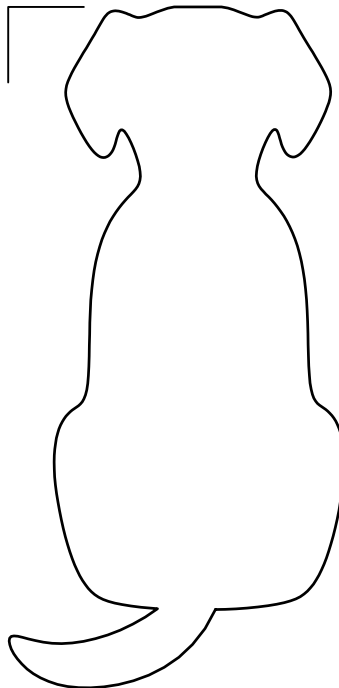
5. OCTAGON



3. a) Using the semi-circle given below, construct a right-angled triangle having the hypotenuse as the diameter of the semi-circle, and one side of 50 mm. (3)

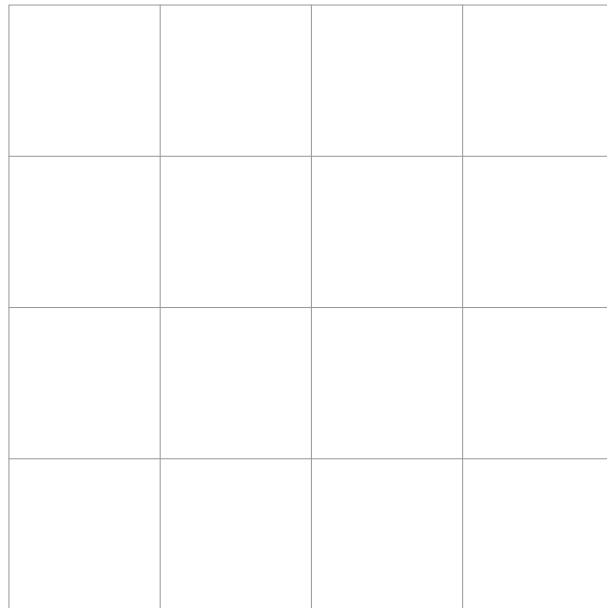
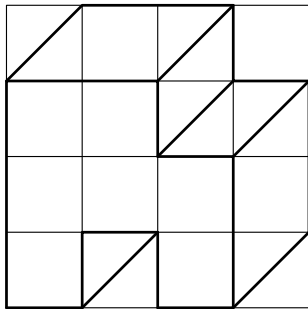


- b) Calculate the area of the dog using the counting squares method. (4)



Estimated area = _____

4. a) Draw the 3D shape below using the grid. (3)
 b) Identify the **THREE** faces and shade the final drawing using **THREE** different colours. (3)
 c) Write down the name of the pictorial projection used. (1)



Pictorial projection used: _____

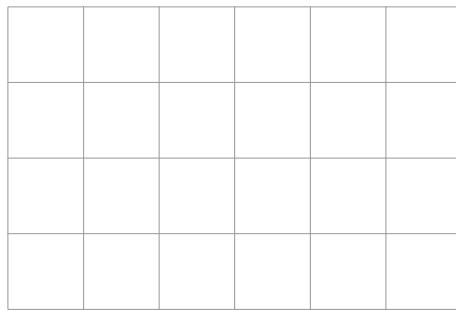
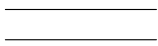
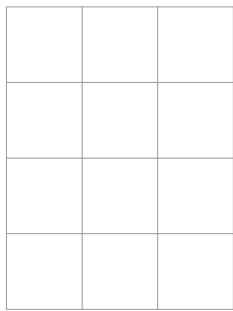
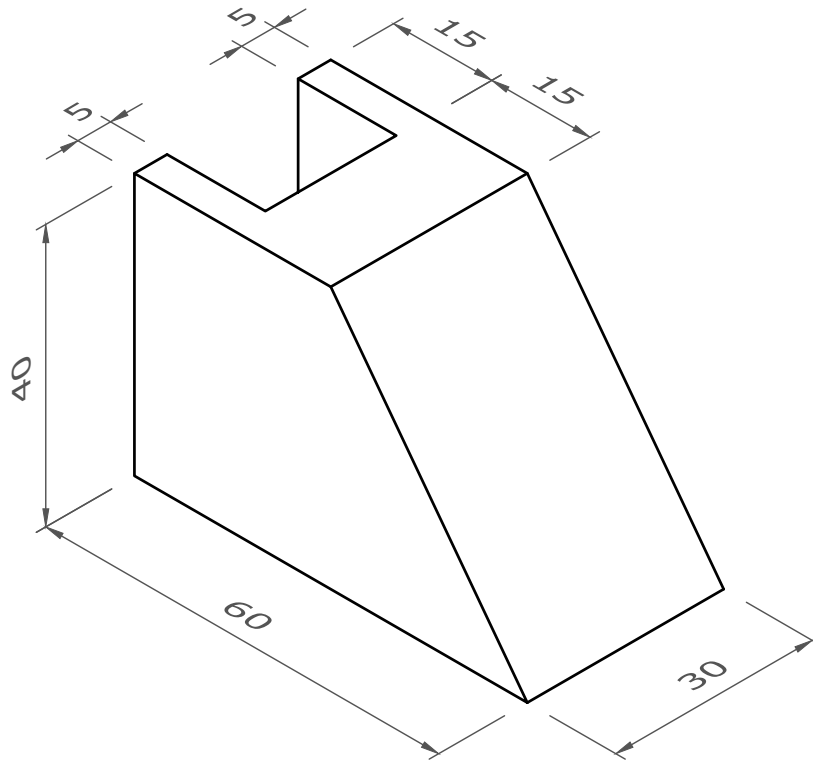
- d) An isometric drawing of a simple house is given below. Draw a well proportioned freehand sketch in isometric using the start lines given below. (5)



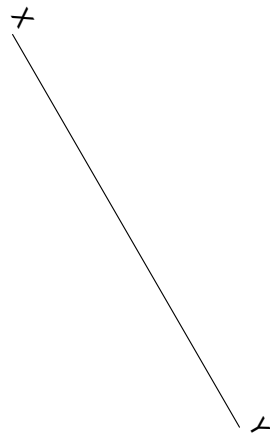
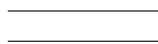
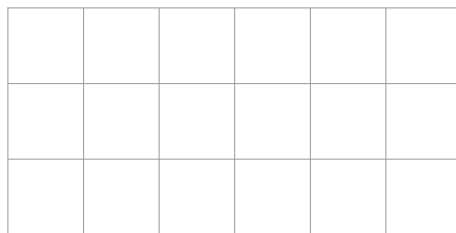
source: vecteesy.com

5. A dimensioned drawing of an isometric sloping block is given below.

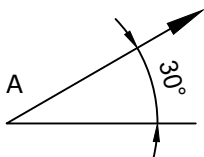
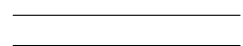
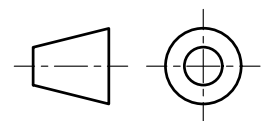
- a) Using the grids, draw a front elevation, an end elevation and a plan, including hidden lines. (6)
- b) Label the end and plan views. (2)
- c) Project an auxiliary elevation as seen from arrow A using the X-Y line, including hidden lines. (4)
- d) Label the first angle projection symbol. (2)



FRONT



AUXILIARY ELEVATION



7. a) Define raster graphics.

(2)

b) State **TWO** reasons why Layers are used in image editing software.

(2)

c) The following computer programme is written to create a font character.

DATA: A = 50; B = 100; C = 150; D = 200; E = 250; F = 300; G = 350; H = 400; I = 450.

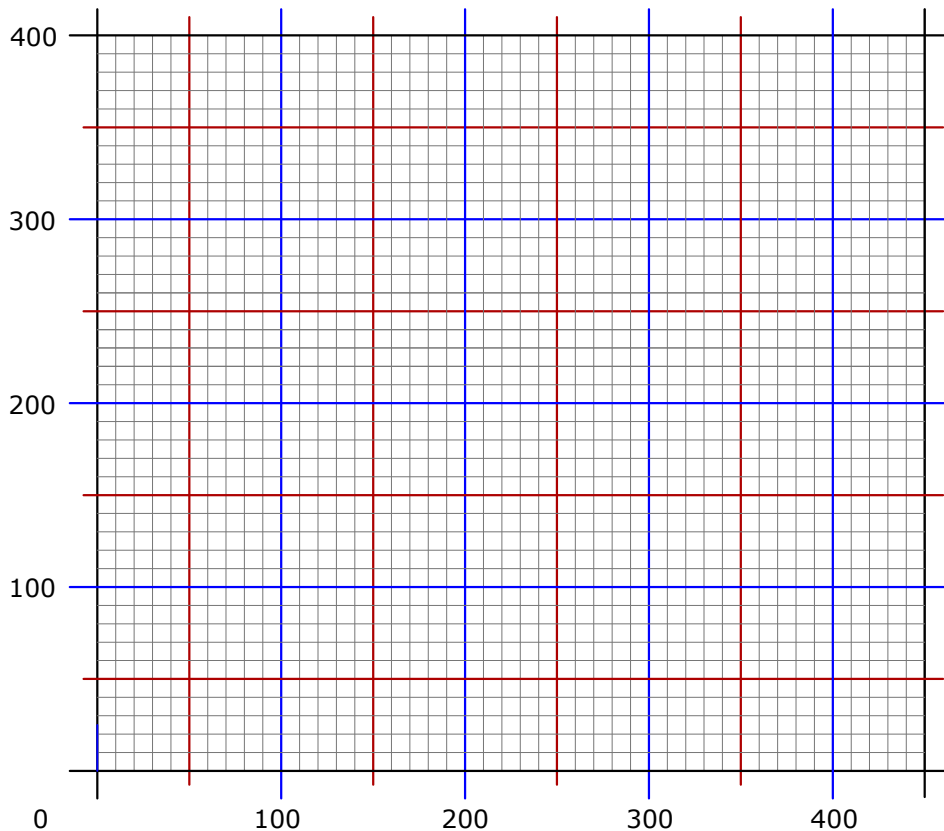
ACI 7: MOVE A,A; DRAW A,G; DRAW H,G DRAW H,A; DRAW A,A:

ACI 1: MOVE D,B; DRAW D,E; DRAW B,E; DRAW B,F; DRAW G,F; DRAW G,E; DRAW E,E;
DRAW E,B; DRAW D,B.

COLOUR	RED	BLACK
ACI No.	1	7

The **DATA** statement specifies the numeric values (in pixels) of given 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 with the number.

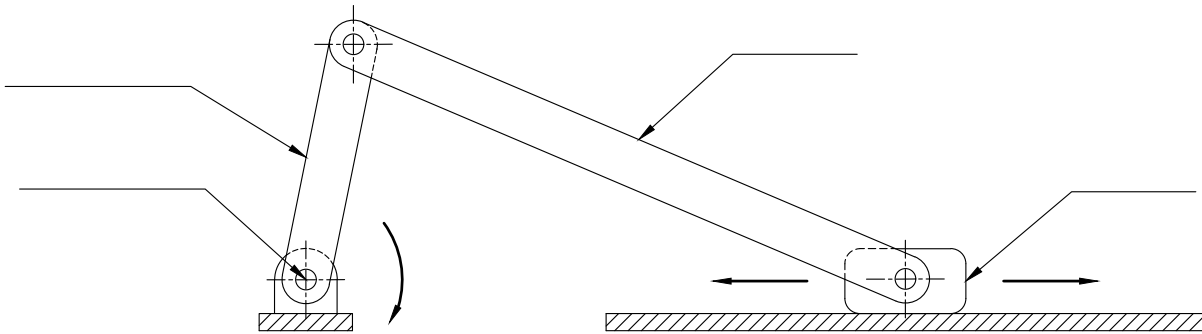
Plot the image produced by this programme on the 450 X 400 grid given below. (6)



8. A simple mechanism involving one crank, one slider and one linkage is shown below.

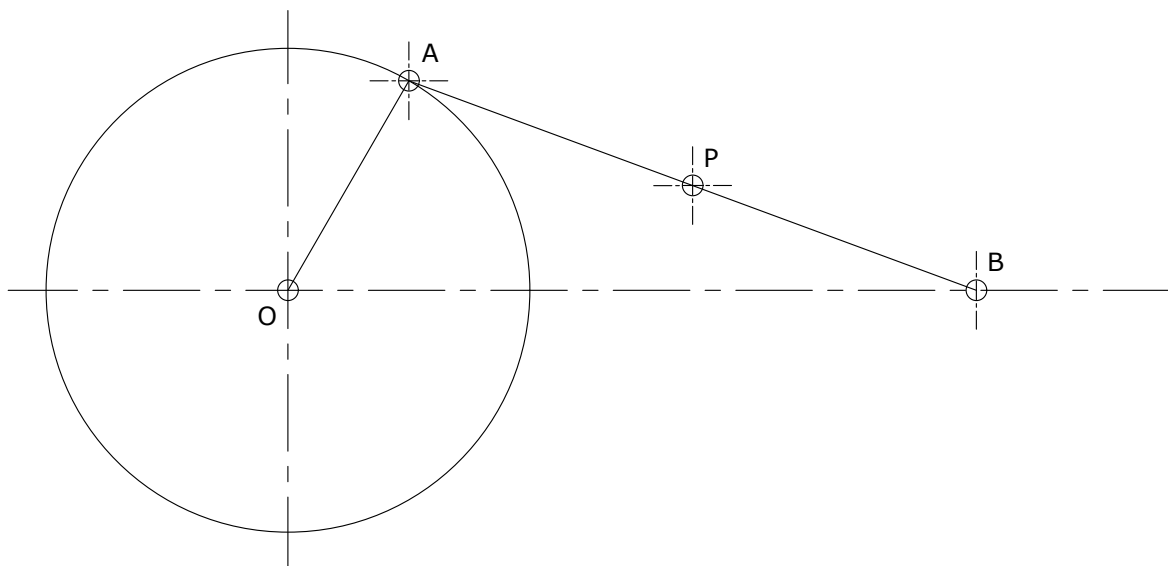
a) Label the crank, fixed pivot, slider and linkage on the mechanism.

(2)



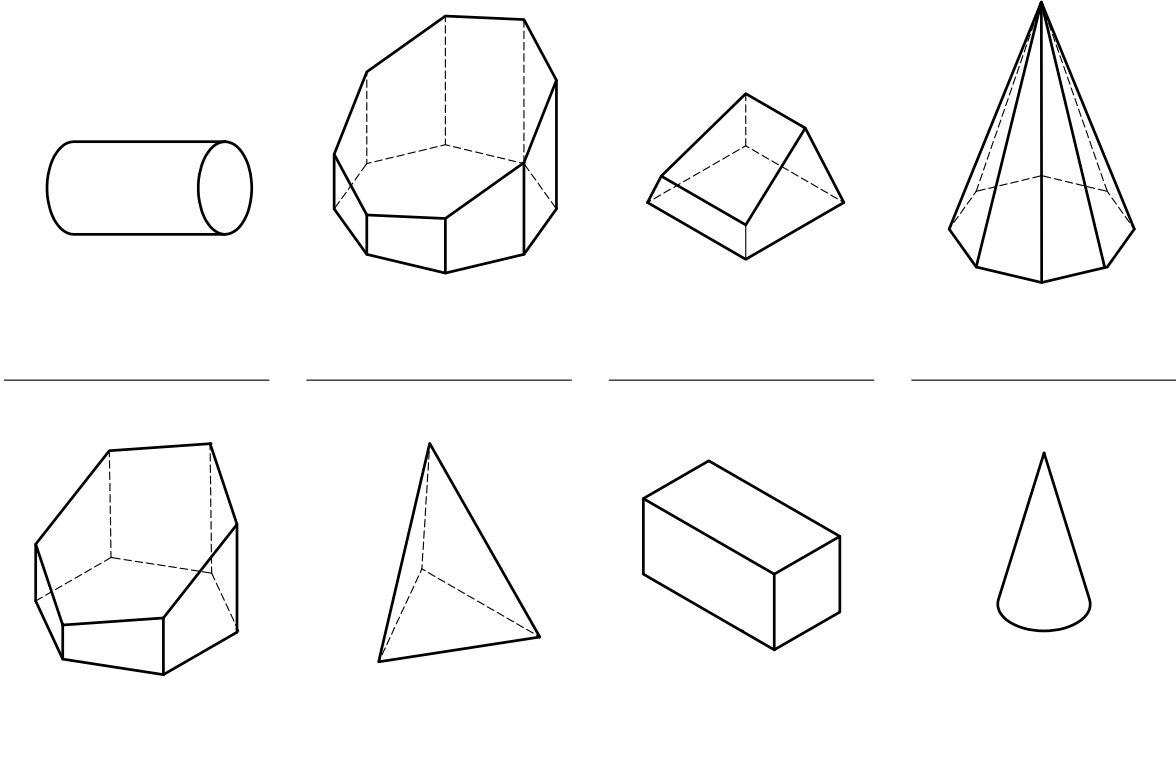
b) Construct the locus of point P for **ONE** complete revolution of the crank OA around centre O, as the linkage AB slides to the left and to the right.

(4)



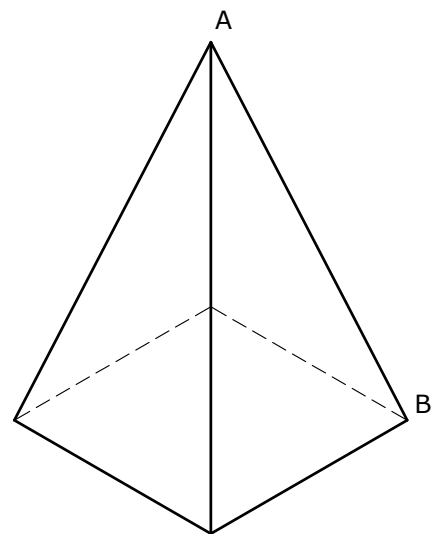
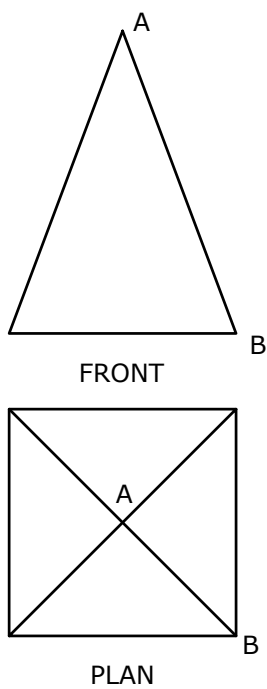
9. a) Label the solids shown below.

(4)



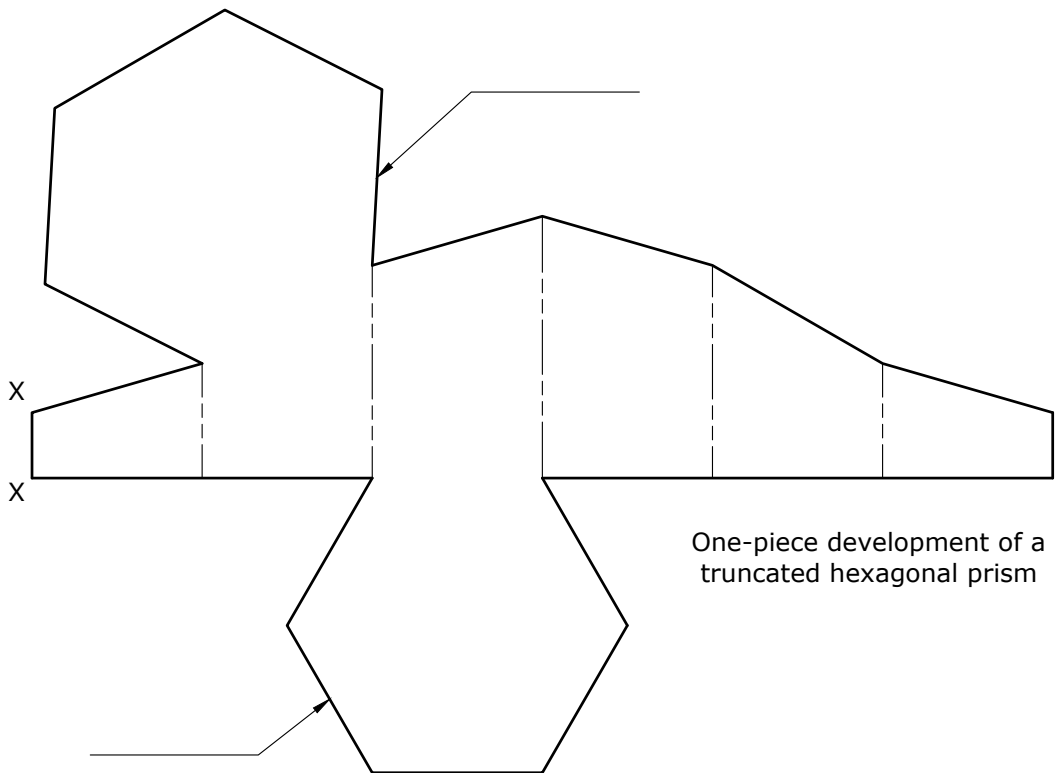
b) A pictorial view of a square based pyramid, a front elevation and a plan are given. Find, by construction, the true length of side AB and write it down.

(4)

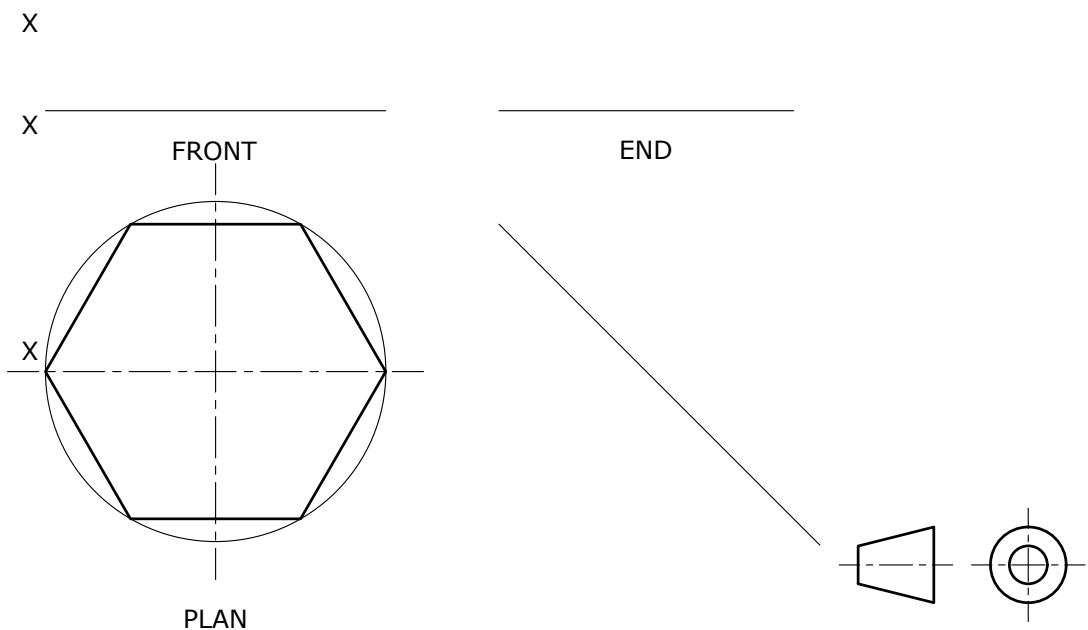


True length of side AB = _____ mm

10. a) A one-piece development of a truncated hexagonal prism is given. Add the missing fold lines and label the bottom and the true shape of cut. (3)



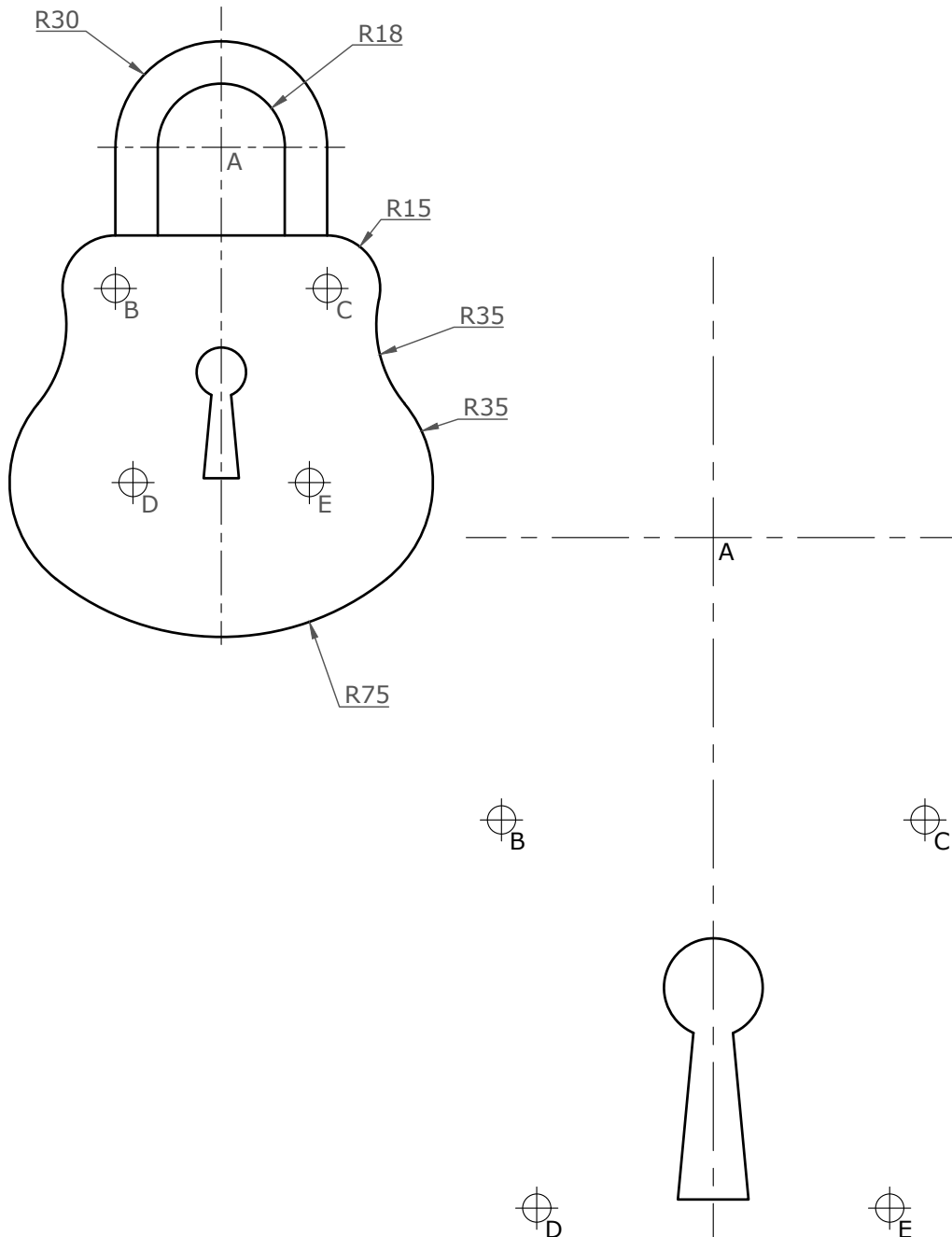
- b) A plan and some start lines have been given below. Taking measurements directly from the one-piece development above with joint line X-X, construct the front and the end elevations. (4)



(Total: 7 marks)

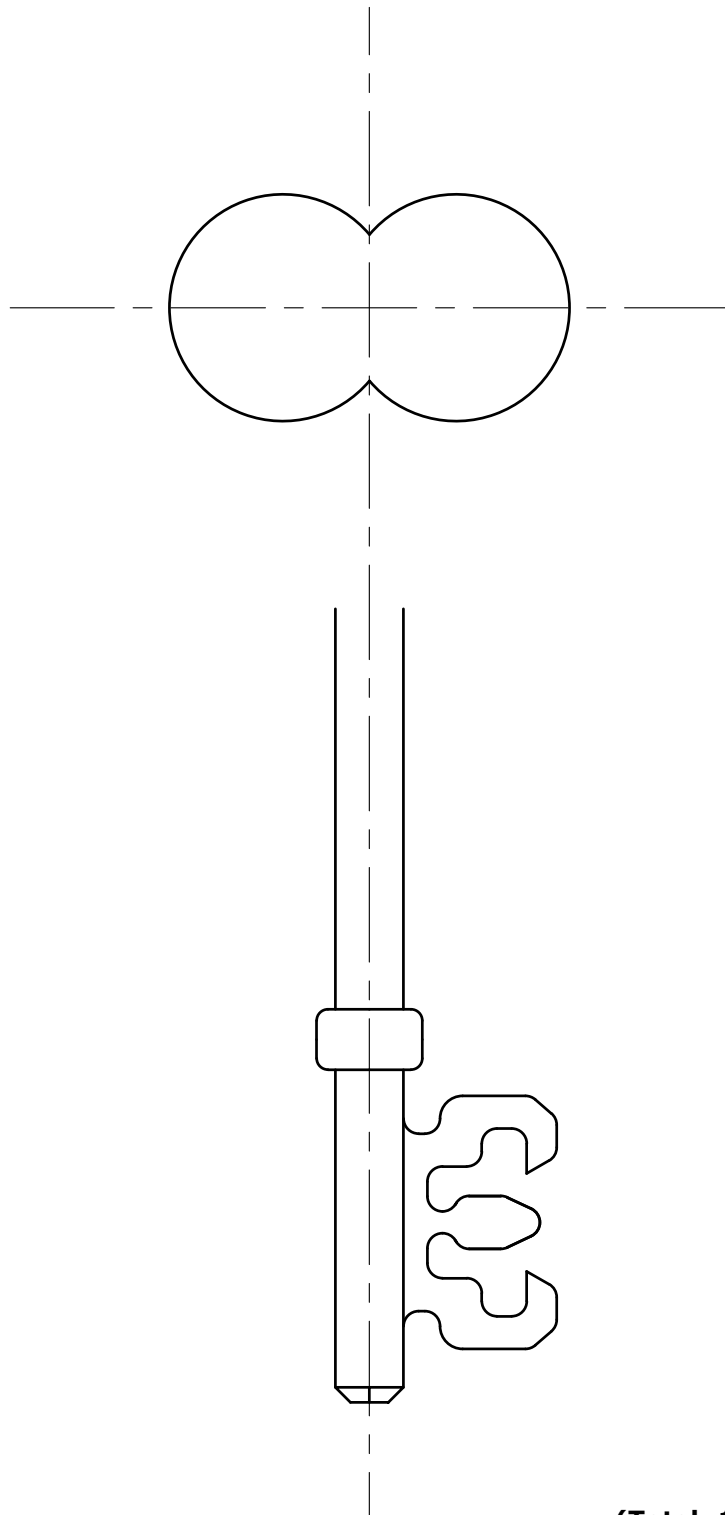
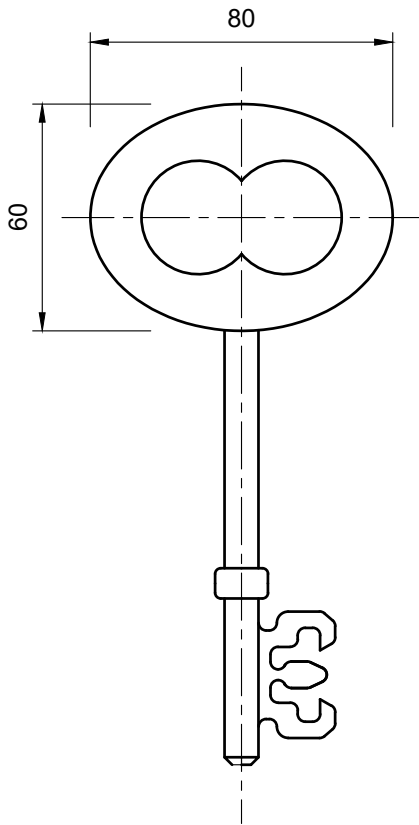
11. a) The drawing below shows the profile of a lock. Complete the profile by:

- i) drawing **TWO** concentric semi-circles R30 and R18 using centre A; (1)
- ii) drawing **TWO** circles R15 using centres B and C; (1)
- iii) drawing **TWO** circles R35 using centres D and E; (1)
- iv) constructing an external arc R35 touching circles with centres C and E; (2)
- v) mirroring the construction on circles with centres B and D; (2)
- vi) constructing an internal arc R75 touching circles D and E and completing the profile. (3)



b) The drawing below shows the profile of a key. Complete the profile by:

- i) constructing the elliptical key bow having a major axis of 80 mm, minor axis of 60 mm and completing the profile; (4)
- ii) locating and labelling the focal points of the key bow. (1)

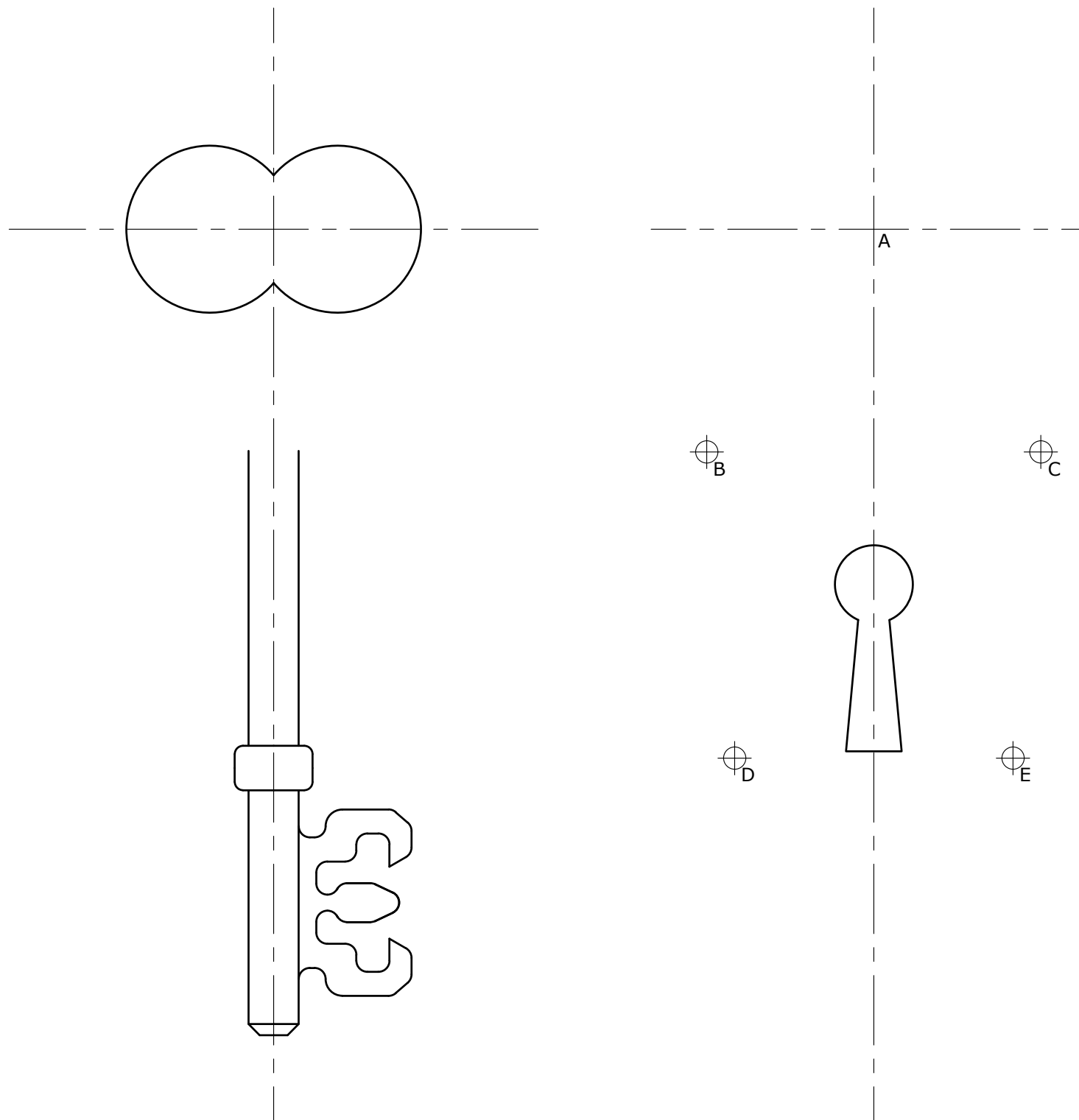
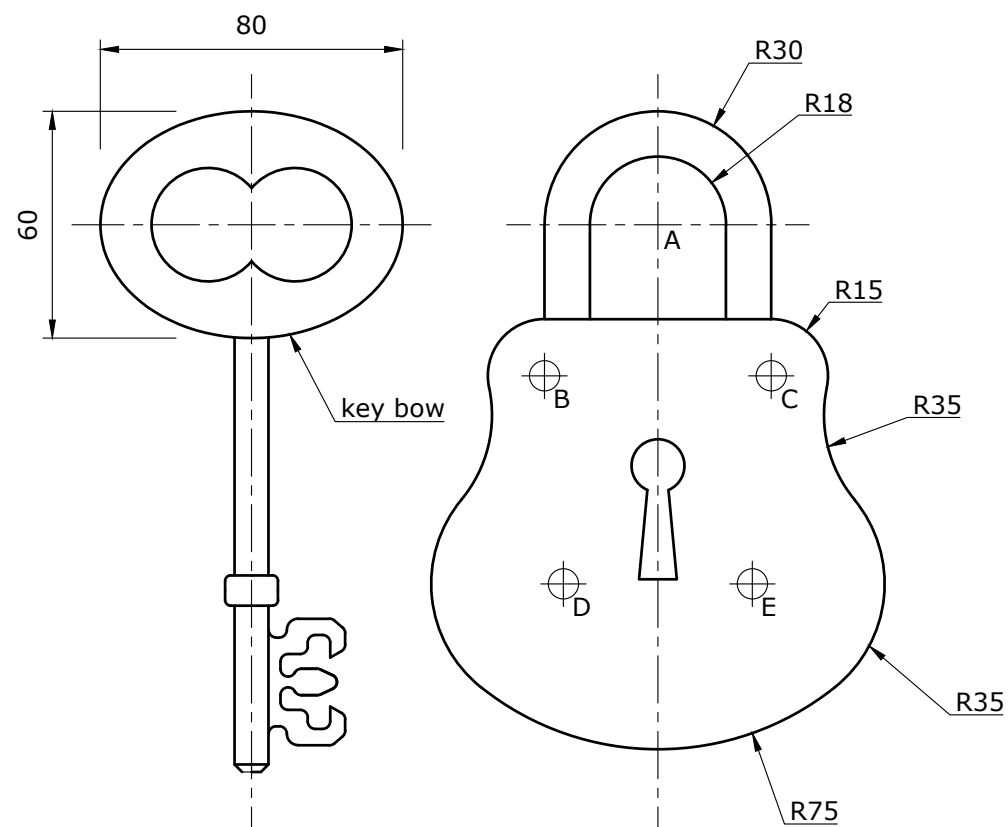


SUBJECT: **Graphical Communication**
 PAPER NUMBER: II - Level 2-3
 DATE: 19th May 2025
 DURATION: 2 hours 5 mins

Question 1.
 The drawings below show the profile of lock and key. The dimensions and the start lines are given. Complete the profile by:

- drawing **TWO** concentric semi-circles R30 and R18 using centre A; (1)
- drawing **TWO** circles R15 using centres B and C; (1)
- drawing **TWO** circles R35 using centres D and E; (1)
- constructing an external arc R35 touching circles with centres C and E; (2)
- mirroring the construction on circles with centres B and D; (2)
- constructing an internal arc R75 touching circles D and E and completing the profile; (3)
- constructing the elliptical key bow having a major axis of 80 mm, minor axis of 60 mm and completing the profile; (4)
- locating and labelling the focal points. (1)

(Total: 15 marks)



DO NOT WRITE ABOVE THIS LINE

Question 2.

Artificial intelligence (AI) is becoming an increasingly popular medium for youngsters to access information on the Internet. According to a survey in a Maltese school, this type of technology is mostly used by students for accessing news, music, general information, and for the organization of daily activities. The data collected is presented in Table A. Produce a pie chart in order to visualise the given set of data and design two pictograms.

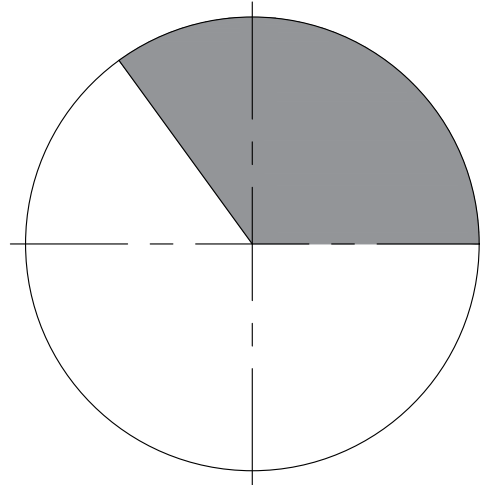
- a. Complete table A by working the degrees and colouring the legend. (3)
- b. Complete the pie chart using the data from table A and colour to match the legend. (3)
- c. Convert the pie chart into a planometric drawing with a vertical height of 20 mm. (2)
- d. Add the **TWO** missing pictograms, using freehand sketches to generate your ideas. (4)

(Total: 12 marks)

Table A

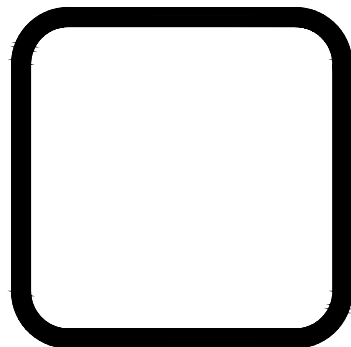
USE OF AI	PERCENTAGE	DEGREES	LEGEND (colour)
NEWS	35%	126°	
MUSIC	20%		
GENERAL INFO	30%		
ORGANIZATION	15%		

Pie Chart

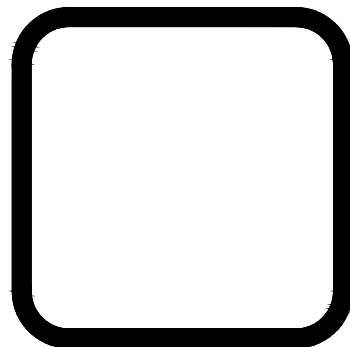


SPACE FOR FREEHAND SKETCHES

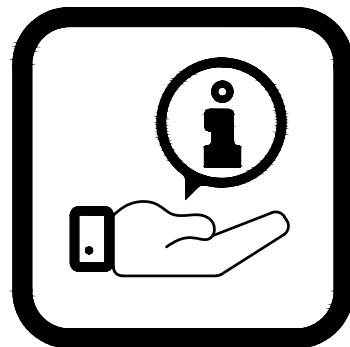
PICTOGRAMS



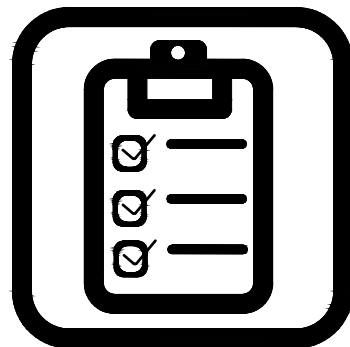
NEWS



MUSIC



GENERAL INFO



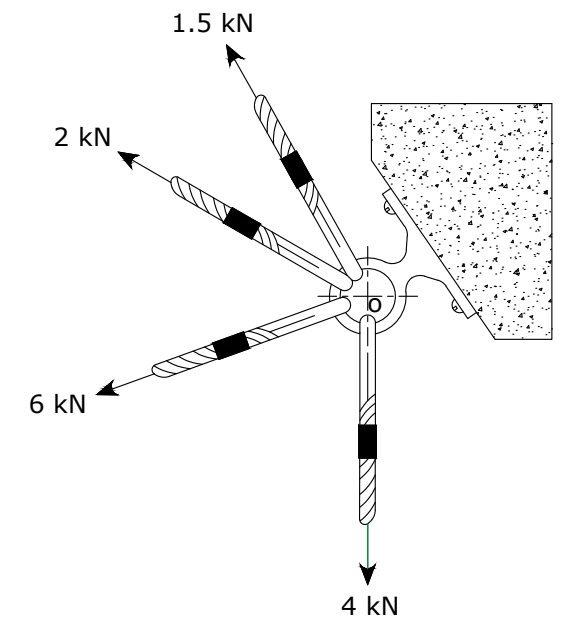
ORGANIZATION

Question 3.

The figure below shows four cables pulling on a closed hook that is bolted to a concrete beam. The forces exerted by these cables are concurrent and coplanar. The forces are acting on centre point O.

- a. By using a scale of 10 mm to represent 1kN, draw a vector diagram to find the resultant force on the closed hook. (8)
- b. Mark with an arrow the resultant force on the vector diagram. (1)
- c. Write down the resultant force in the space provided. (1)

(Total: 10 marks)



Resultant force: _____ kN

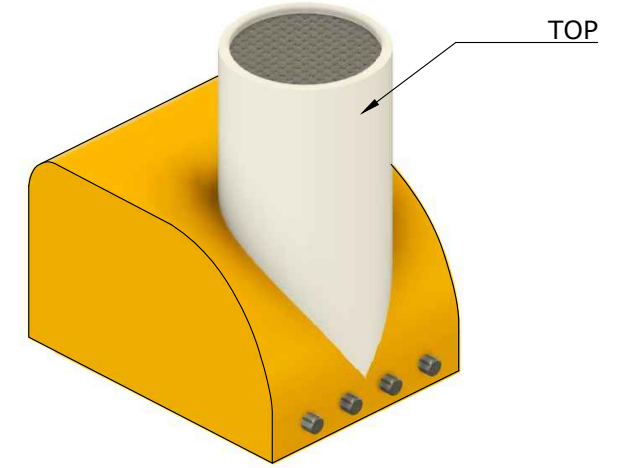
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Question 4.

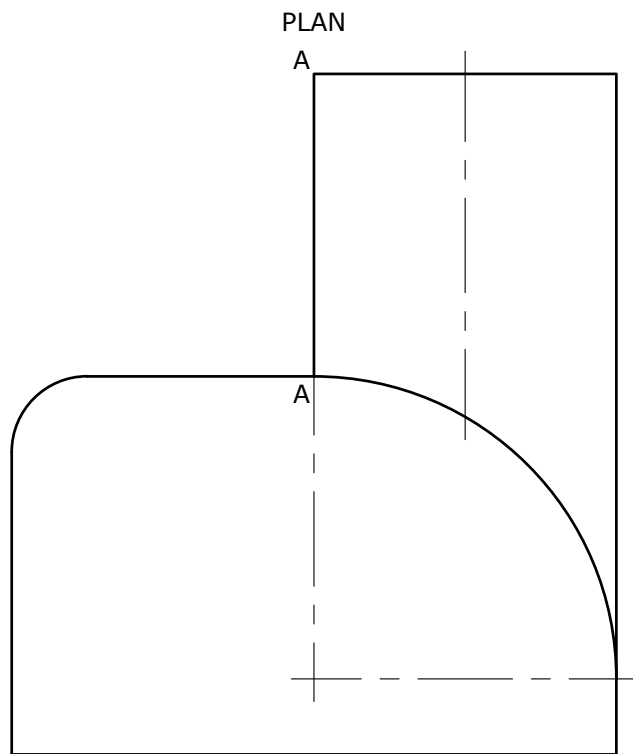
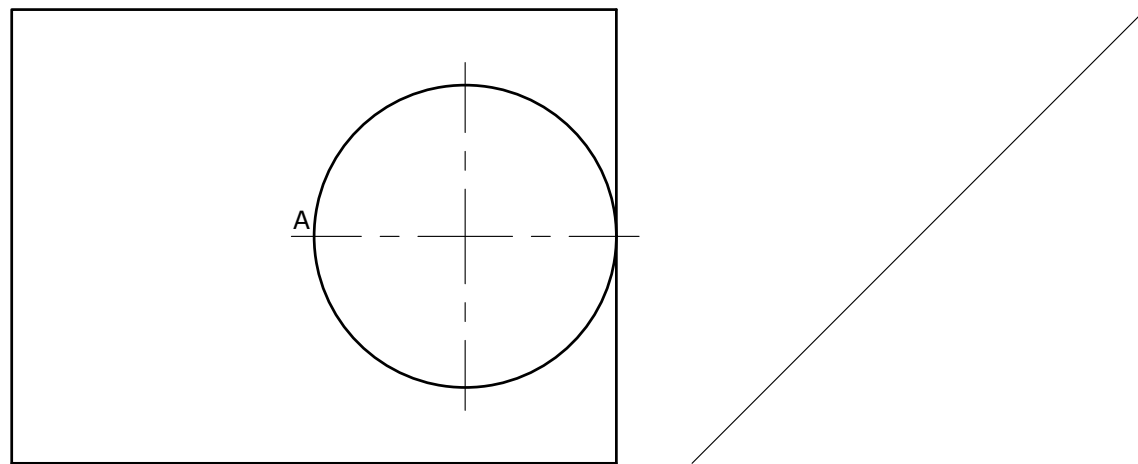
The pictorial drawing on the right shows a virtual assistant (VA) that connects to the world wide web. Its design is based on two intersecting solids. Three orthographic views of this VA are given below. These consist of a front elevation, a plan, and an incomplete end elevation presented in third angle projection.

- a. Complete the end elevation by constructing the curve of intersection between the two solids. (5)
- b. Use simple block letters to label the end elevation. (1)
- c. Draw the third angle symbol. (1)
- d. Construct the development of the cylindrical part (TOP) of the VA using the given start lines and taking A-A as the joint line. (5)

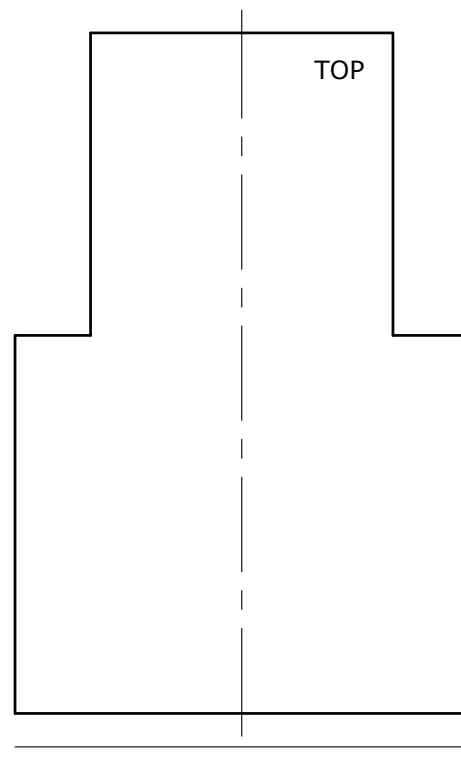
(Total: 12 marks)



pictorial view of VA



FRONT ELEVATION



TOP

DEVELOPMENT



3rd angle projection

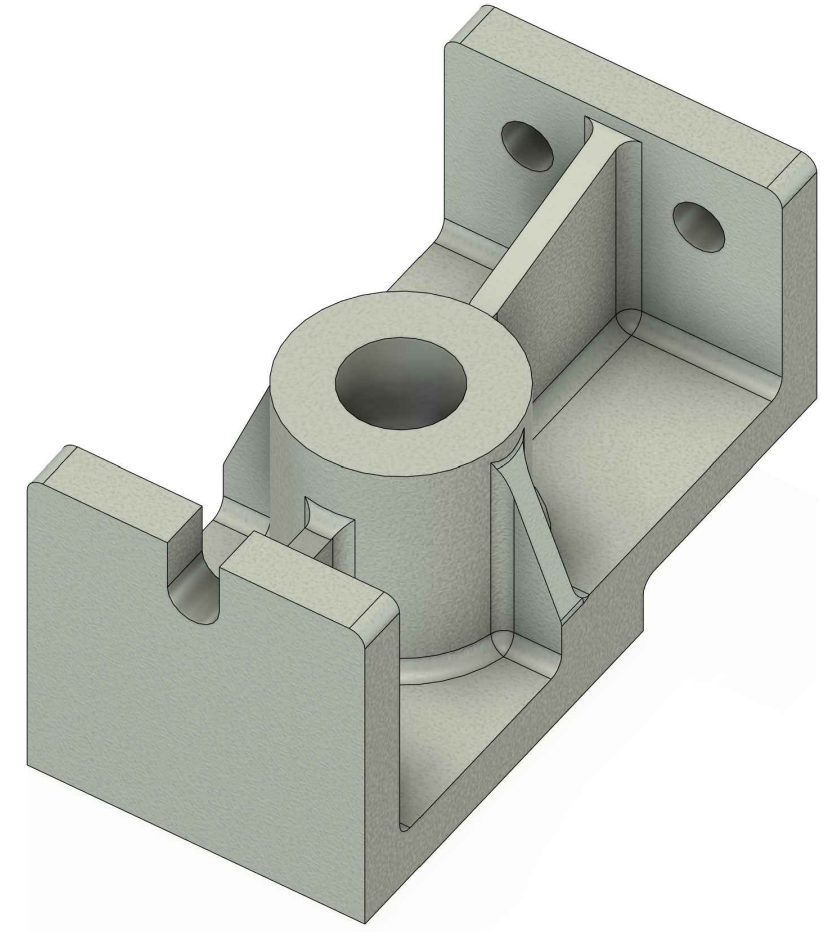
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Question 5.

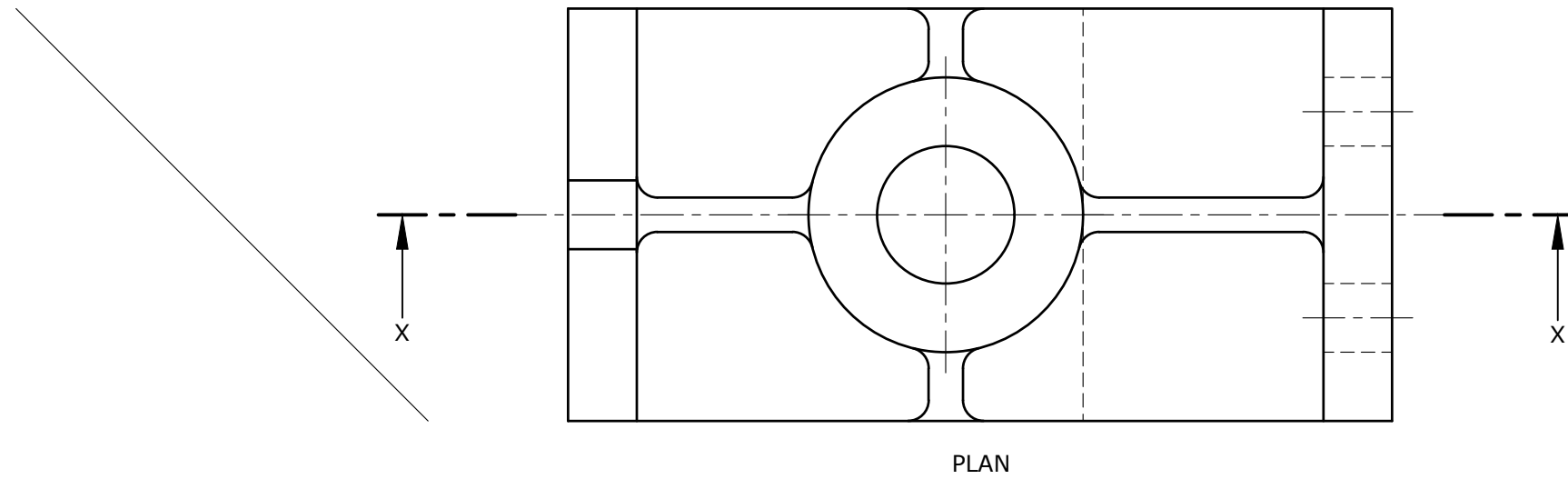
The pictorial view of a cast iron machined block is given on the right. The end elevation, the plan, and the profile of the front elevation are also given below.

- a. Complete the sectional front elevation on cutting plane X-X. (8)
- b. Add the missing centre lines and finish off the drawing. (2)

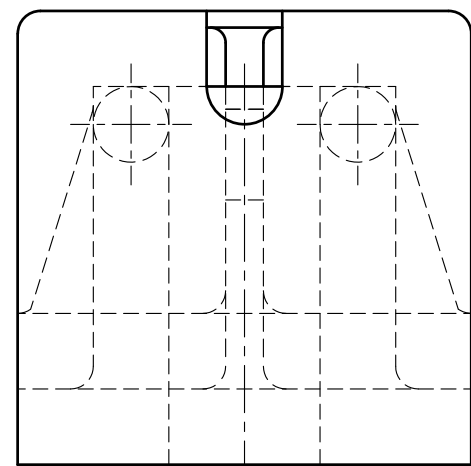
(Total: 10 marks)



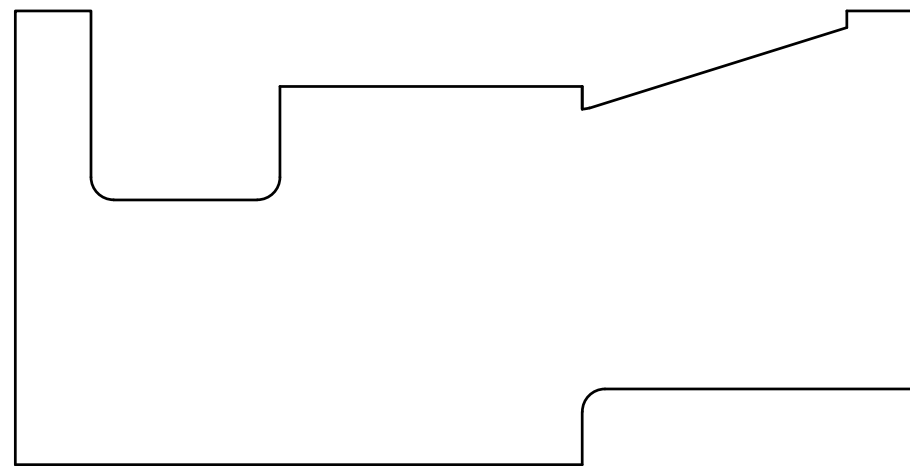
pictorial view of machine block



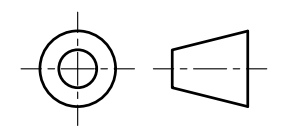
PLAN



END ELEVATION



X - X



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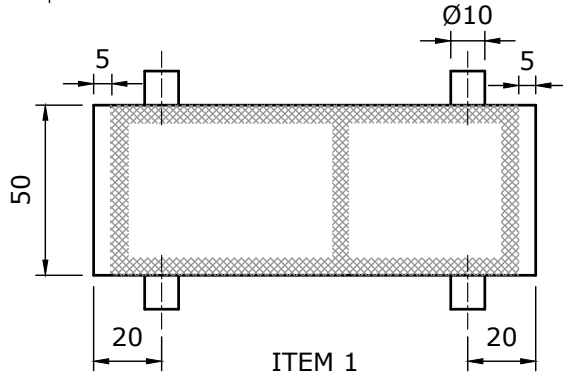
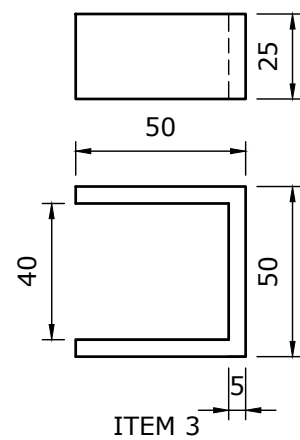
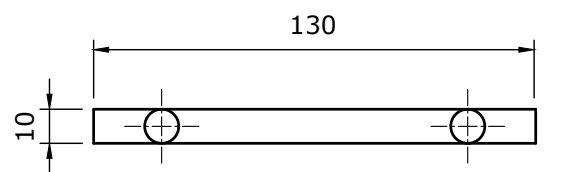
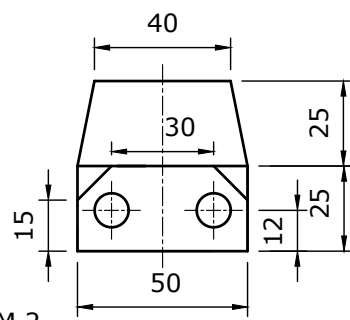
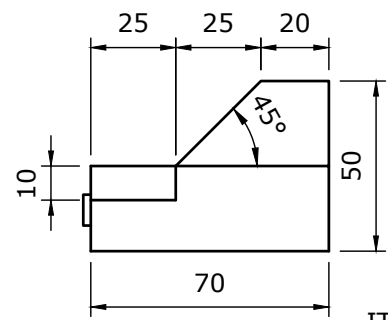
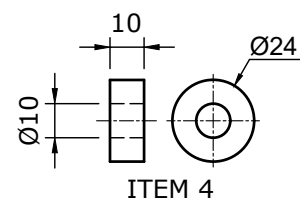
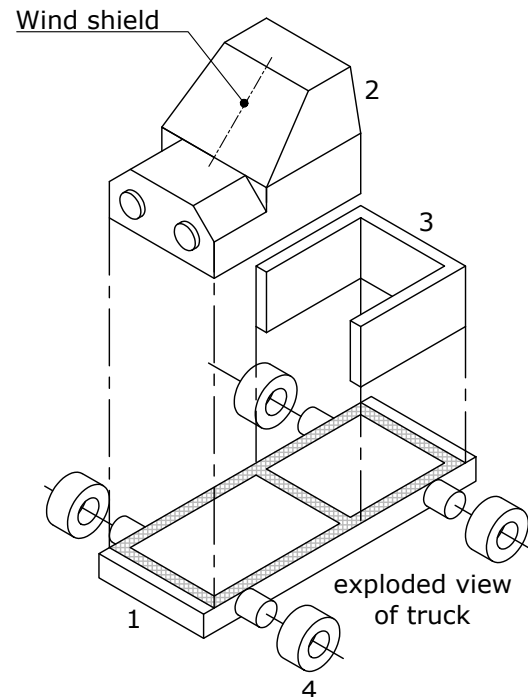
Question 6.
 An exploded view of a wooden toy truck is shown on the right.
 Detail drawings of each item making up the truck are given below.
 Use the given starting lines to complete the following views of the assembled truck:

- a. the front elevation; (5)
- b. the end elevation; (5)
- c. the true shape of the wind shield. (4)

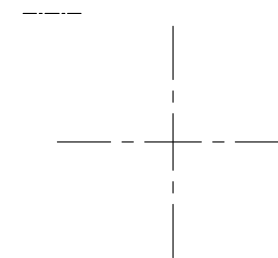
Note: Show all hidden details.

(Total: 14 marks)

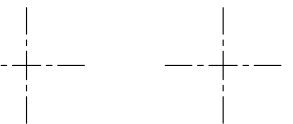
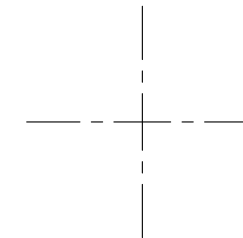
ITEMS LIST		
ITEM	QTY	DESCRIPTION
1	1	CHASSIS
2	1	CABIN
3	1	CARGO BED
4	4	WHEELS



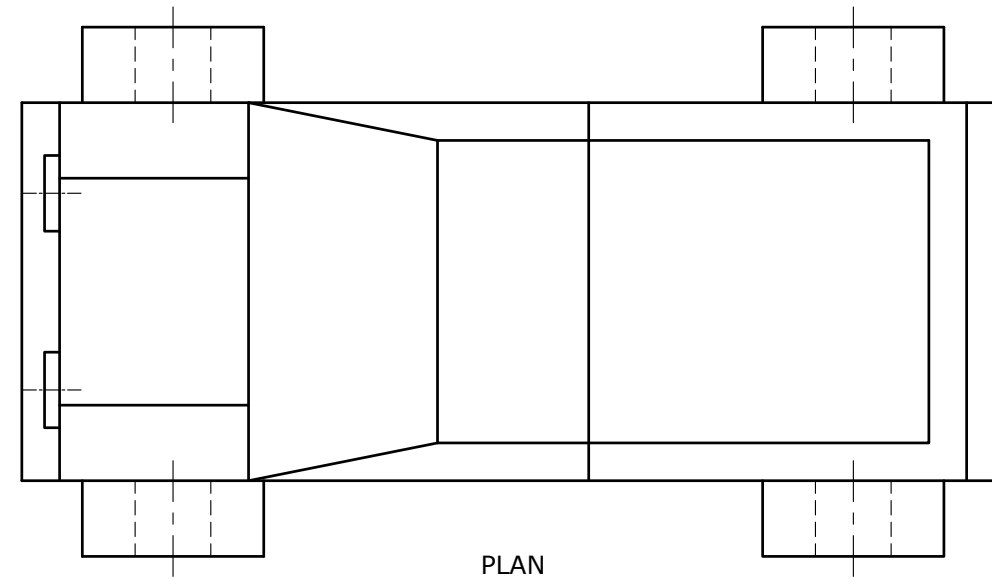
centre line for true shape



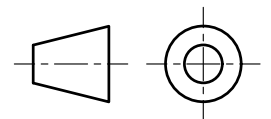
FRONT ELEVATION



END ELEVATION



PLAN



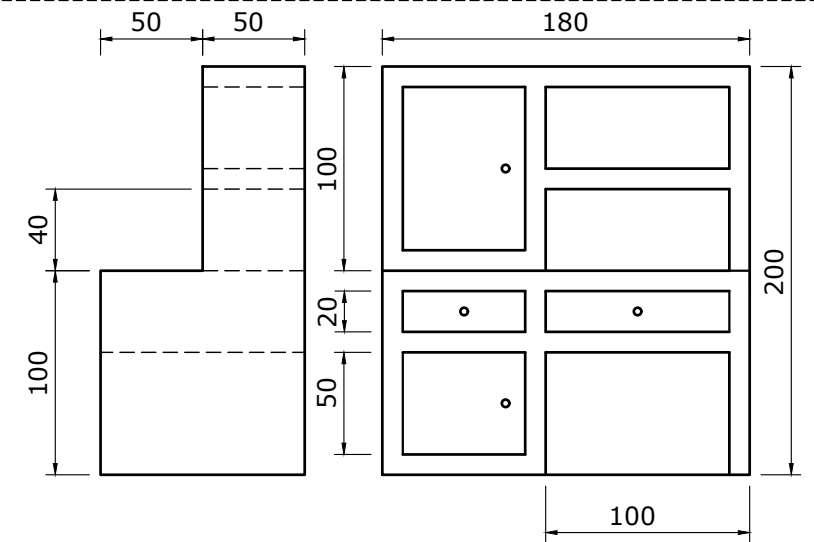
DO NOT WRITE ABOVE THIS LINE

Question 7.

Two orthographic views of a toy desk are given on the right. An isometric view of the desk is also given below. The backside has negligible thickness and the drawer and knob designs are all decals.

- a. Use the given starting lines to draw an estimated two point perspective view of the desk. (9)
- b. Render in colour the isometric drawing, material: wood. (3)

(Total: 12 marks)

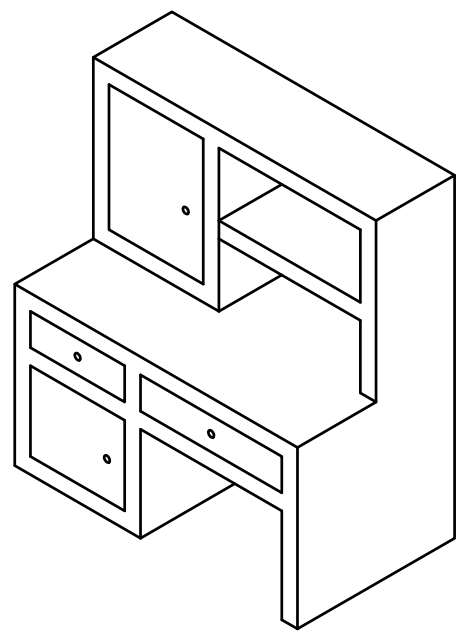


Material thickness is 10 mm throughout.

VP1

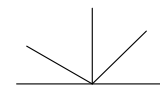


VP2

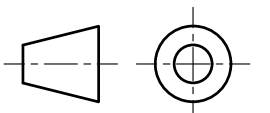


A

isometric drawing
to be rendered



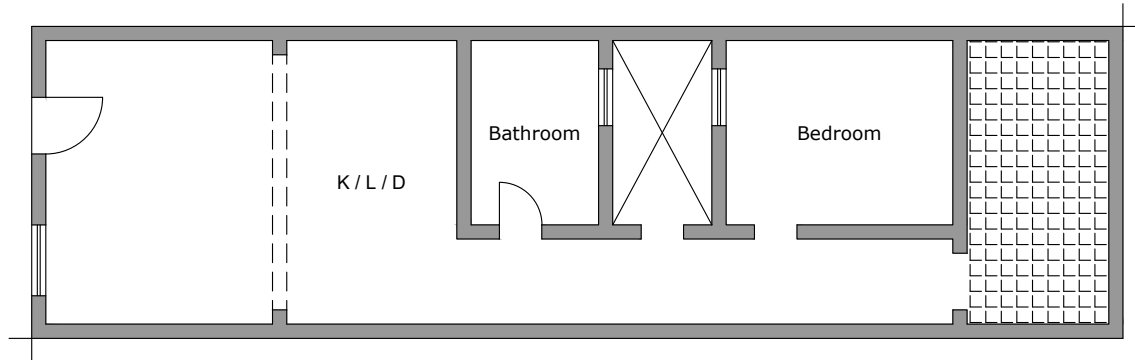
A



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Question 8.

Suzanne used a CAD software program to produce the following simple architectural plan. The plan shows the layout of a single bedroom maisonette having a combined open plan, a bathroom and back yard. Clear and legible handwritten answers in pen or pencil are accepted where long answers are required.



- a. Explain **ONE** advantage and **ONE** disadvantage of using CAD software to produce this plan.

 _____ (2)
- b. Mark on the plan, **TWO** places where she needs to use the TRIM command. (1)
- c. Explain **ONE** instance where the MIRROR command can be used.

 _____ (2)
- d. Suzanne drafted this plan in the Model space. Explain why she may need to set up and use the layout space as well.

 _____ (2)
- e. Suzanne is ready and she wants to make a soft copy to share it with her friends. Which file operation does she use and why? (Open / Save / Save as / Plot, file)

 _____ (2)

Suzanne and her friends intend to set up a new architectural firm. They have sketched many logos but chose the one below as their final design.



- f. Explain the use of balance and negative space in this logo.

 _____ (2)
- g. Suzanne and her friends decided to design the logo as a vector artwork rather than a raster image. Explain the advantages and suitability of vector artwork over raster images in this particular case.

 _____ (4)

(Total: 15 marks)