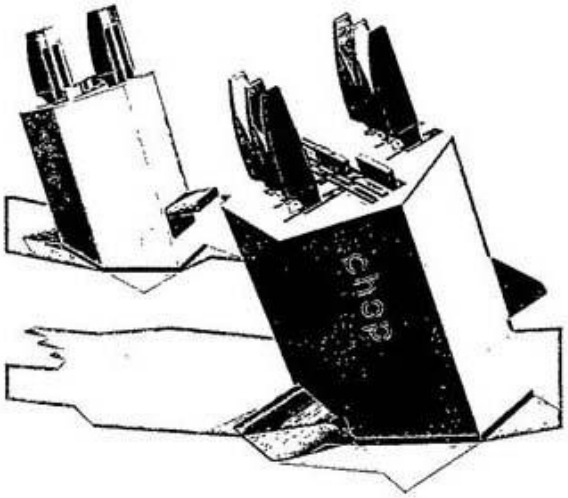
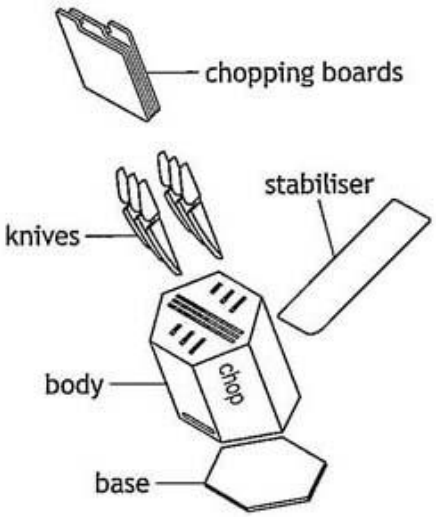
# Candidate 4 evidence

**Total marks — 80**

**Attempt ALL questions**

1. A knife and chopping board storage system is shown below. The body is made from sheet metal. A CAD technician produced the rendered 3D CAD illustration and the pictorial line drawing shown below.




A 3D CAD model rather than a physical model of the storage system was created during the development stage.

(a) State two reasons why a 3D CAD model was more suitable than a physical model. 2

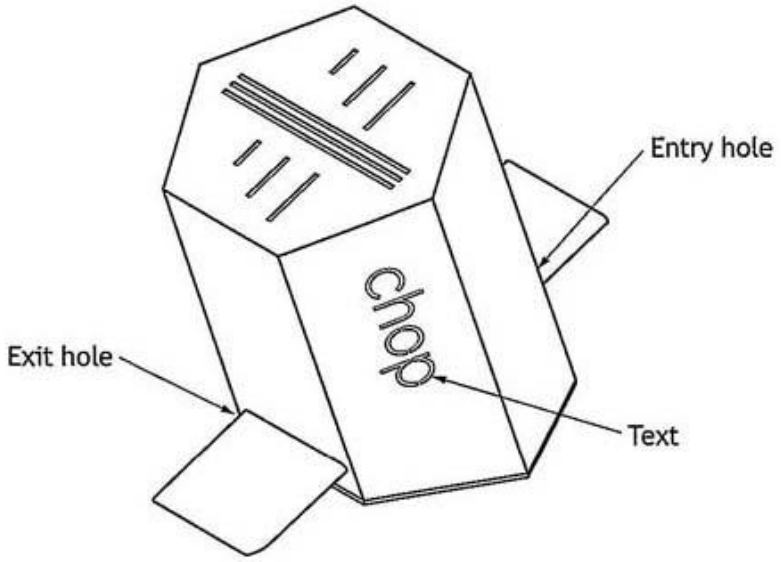
It will take up less physical space.
wont get damaged.
it would save time rather than making it manually.

To produce the CAD model the CAD technician was given information about the storage system. One dimension stated: A/F 300mm.

(b) State the meaning of A/F. 1

1. (continued)

The CAD technician has been asked to produce an appropriate surface development for the storage system and identify where key features will be placed.

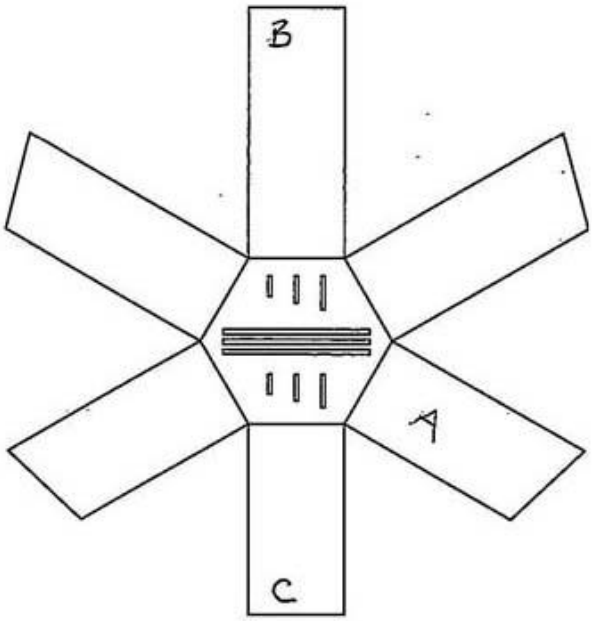



(c) Indicate, on the graphic below, where the Text, Entry hole and Exit hole would be located. 3

Use **A** to indicate on the panel where the Text would be located.

Use **B** to indicate on the panel where the Entry hole would be located.

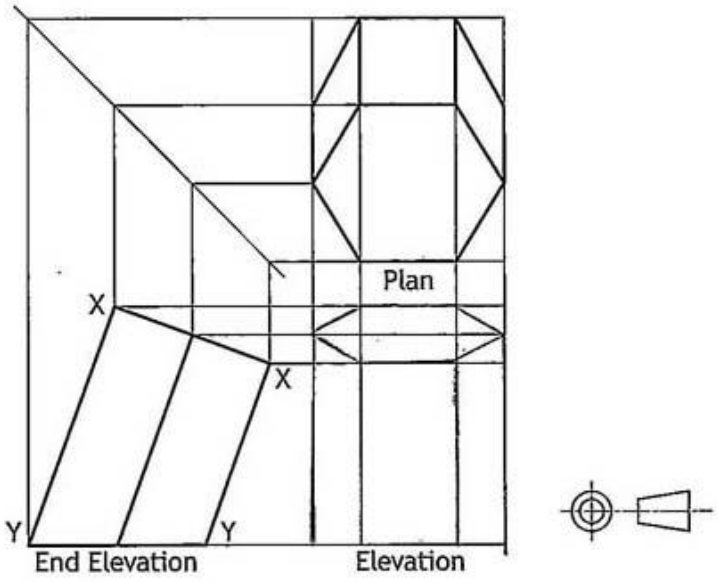
Use **C** to indicate on the panel where the Exit hole would be located.



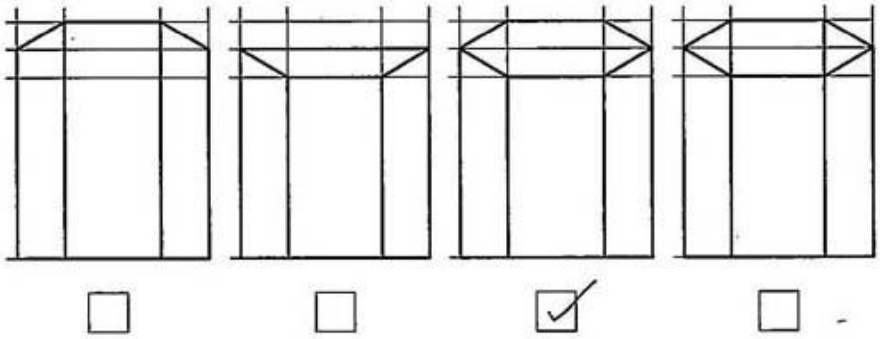
**1. (continued)**

To aid the production of the storage system the CAD technician was asked to complete the orthographic drawing shown below.

Hidden detail and slots removed for clarity.

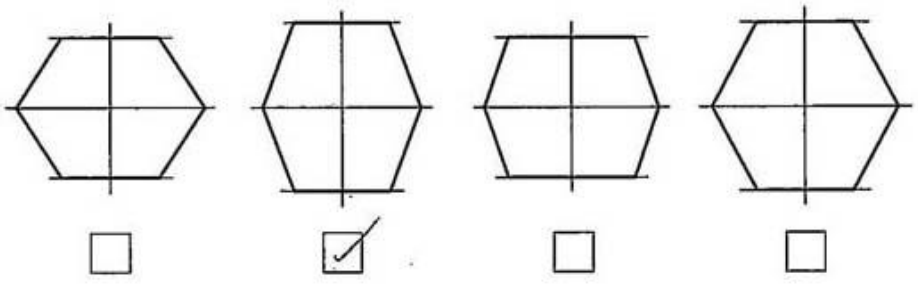



(d) Identify, using a tick (✓), the correct elevation. Ignore wall thickness. **1**



A true shape of surface X–X was required.

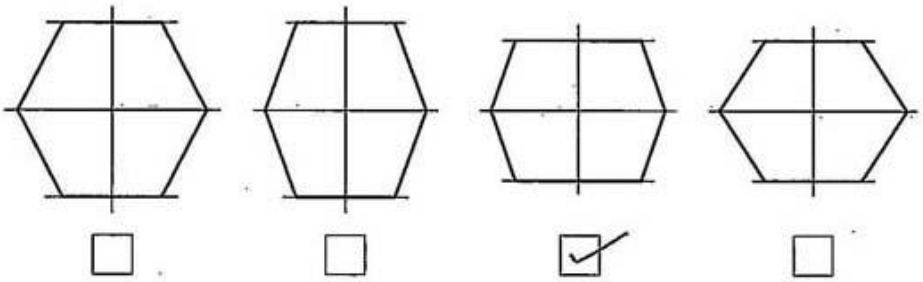
(e) Identify, using a tick (✓), the correct true shape. Use a ruler or trammel to measure. **1**



1. **(continued)**

A true shape of surface Y–Y was required.

(f) Identify, using a tick (✓), the correct true shape. Use a ruler or trammel to measure. 1



**1. (continued)**

The CAD technician was then asked to provide surface developments of the body of the knife block, without the top.

(g) Identify the two correct surface developments, shown opposite, of the knife block when opened out at surface generators 'A' and 'B'.

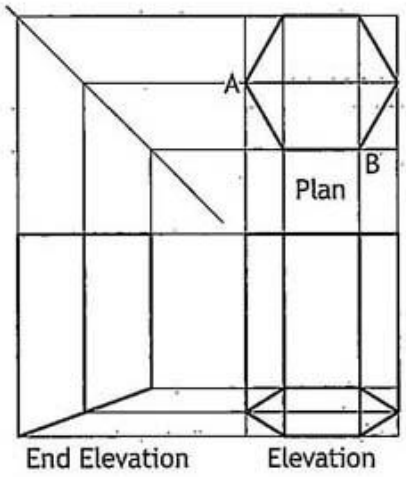
**You should refer to the orthographic drawing below.**

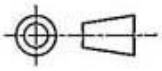
(i) When opened out at generator A, the correct surface development is view. 1

3 *Insert number*

(ii) When opened out at generator B, the correct surface development is view. 1

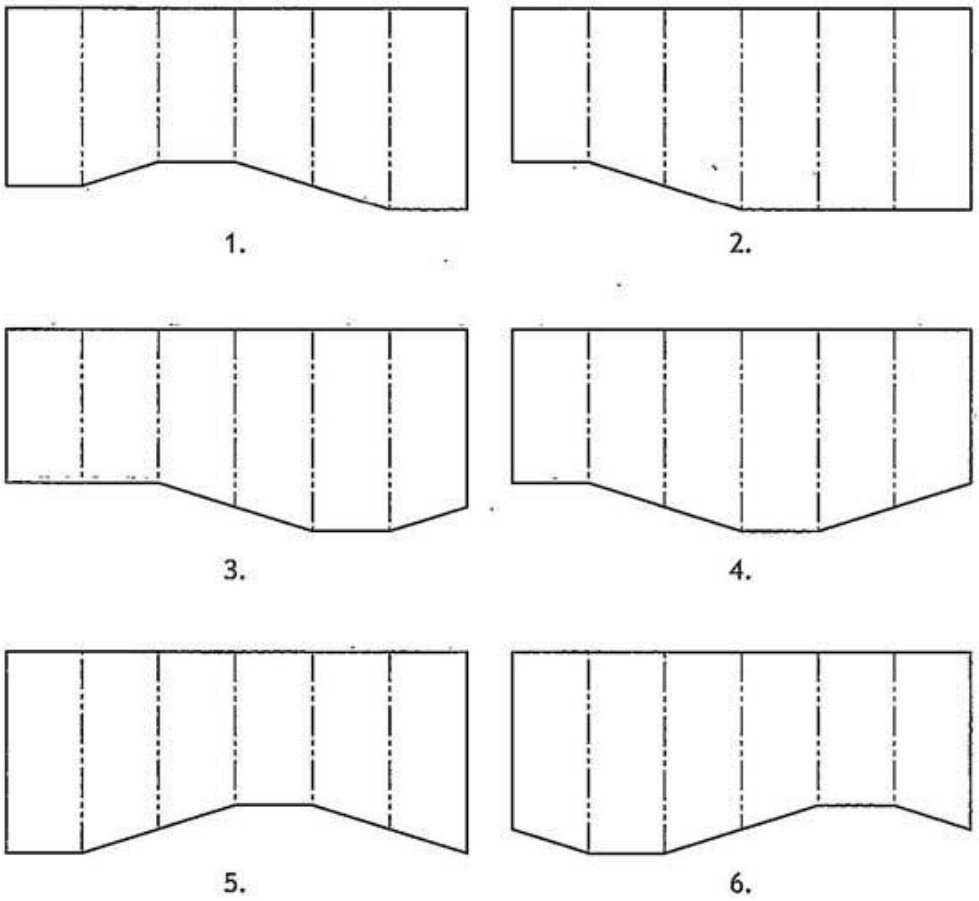
5 *Insert number*



1. (continued)

The range of surface developments are show below.



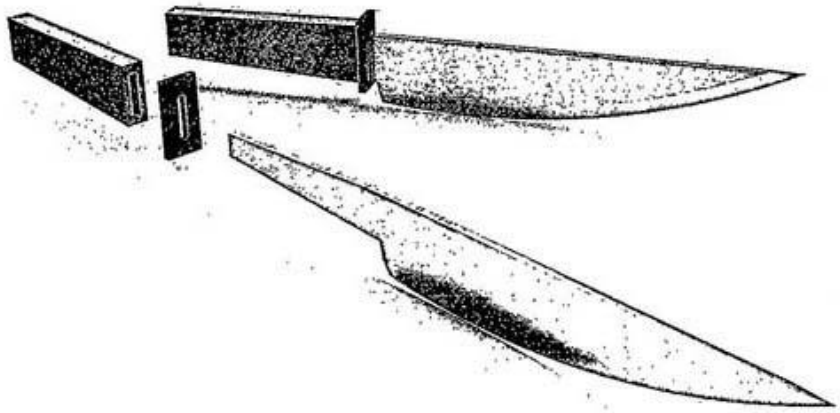

A number of the knife blocks are to be produced from a single sheet of material.

(h) Explain, in terms of environmental impact, why it is important to carefully consider the layout of multiple parts. 1

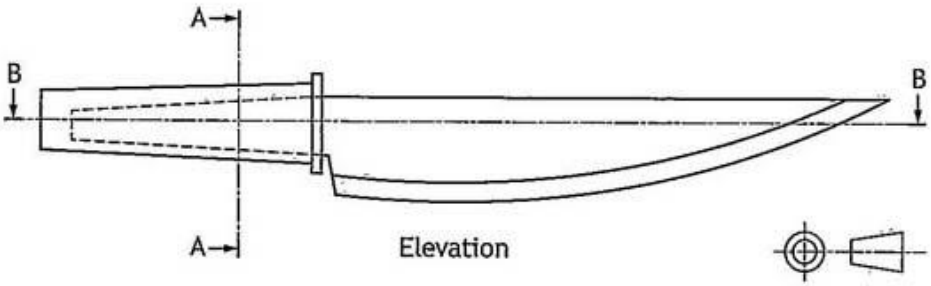
so that there is no or little waste of the product.

**1. (continued)**

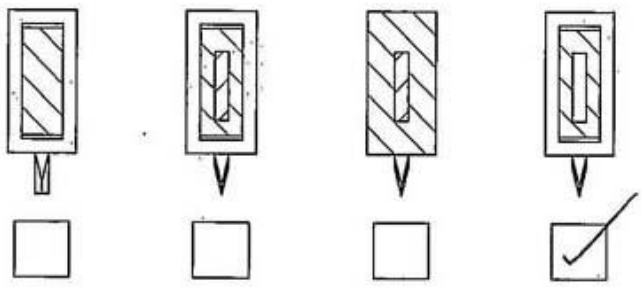
(i) A knife set to complement the knife block is to be produced. Rendered pictorials and orthographic views of one knife are shown below.



Plan

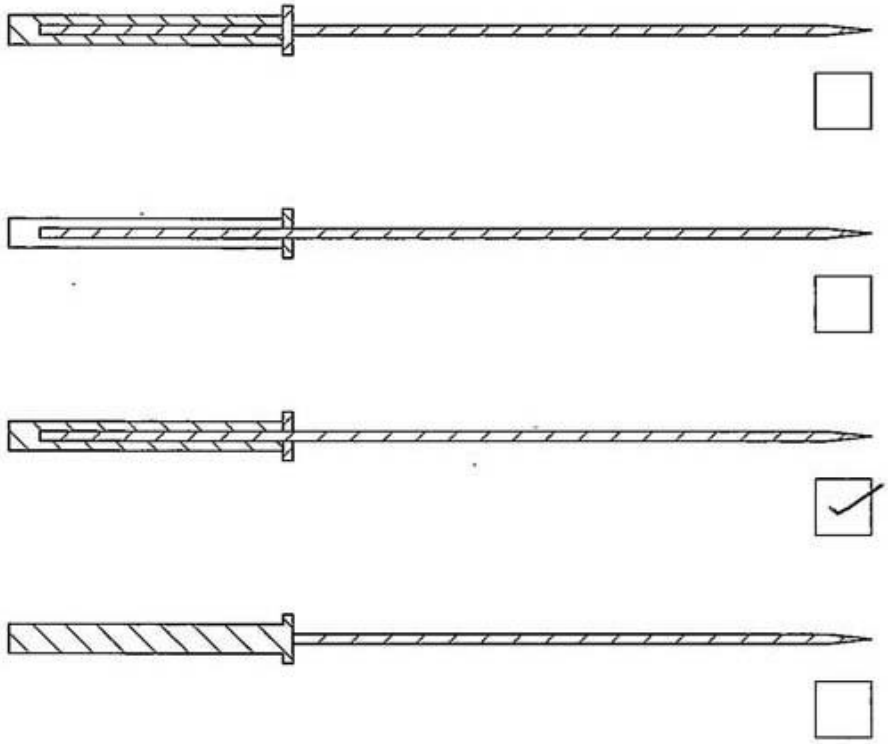



(i) Identify the correct sectional end elevation A-A by ticking (✓) a box below. **1**

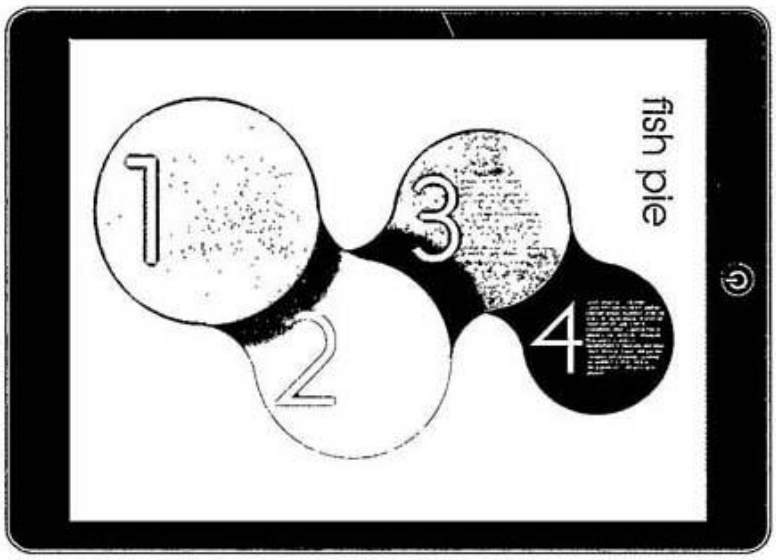


1. (i) (continued)

(ii) Identify the correct sectional plan **B-B** by ticking (✓) a box below. 1



2. A recipe app has been produced. The graphic artist was asked to ensure that the graphic layout was easy to follow.




(a) Describe three ways, other than the numbering system, that the graphic artist has graphically communicated the **sequence** of the recipe shown above. 3

unity - by having the same fonts and ~~it~~ joining up each section

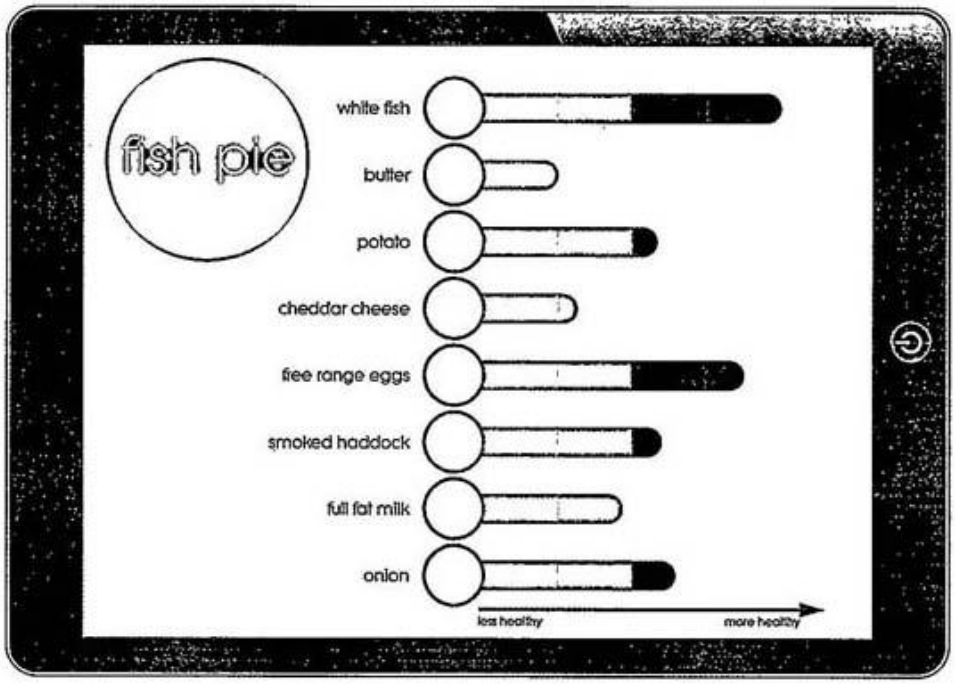
depth - by having ~~them~~ overlaping and drop shadows.

(b) Describe two benefits that producing a recipe app, rather than physically printing a recipe book, would have for the environment. 2

It would save on ink as the whole thing wouldn't have to be printed ~~and~~ there would be less usage of paper which would mean less trees have to be cut down.

2. (continued)

The app also contains an additional feature that analyses individual ingredients and calculates the overall health rating of the recipe.




(c) Name the type of graph or chart that was used in the graphic shown above. 1

bar graph

(d) Describe one way that the graphic artist has graphically communicated the health rating of the individual ingredients. 1

alignment- by having all the words aligned with each other and the bars.

2. **(continued)**

Two different sets of statistics that have been provided are shown below.

| Statistics A | |
|---|---|
| Nutritional Data – Nuts | |
| Cashew | 170 Calories, 13g Fat, 8g Carb, 5g Protein, 1g Fibre |
| Hazelnut | 180 Calories, 18g Fat, 4g Carb, 4g Protein, 2g Fibre |
| Peanut | 170 Calories, 14g Fat, 6g Carb, 7g Protein, 2g Fibre |
| Walnut | 210 Calories, 20g Fat, 6g Carb, 5g Protein, 2g Fibre |

| Statistics B | |
|---|---|
| Healthy diet plan | |
| Fruit and Vegetables | 33% |
| Carbohydrates | 33% |
| Protein | 12% |
| Milk and Dairy | 15% |
| Fats and sugars | 7% |

(e) (i) State the most suitable type of informational graphic to present the data shown in **Statistics A.** 1

poster

(ii) Explain why this is an appropriate type of informational graphic to present. 1

there is lots of information so would be best on a poster

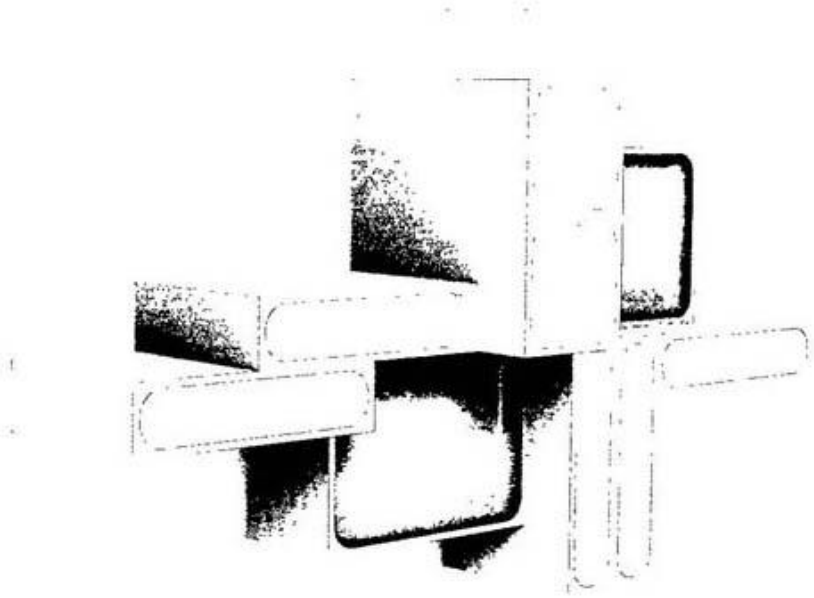
(f) (i) State the most suitable type of informational graphic to present the data in **Statistics B.** 1

Pie chart

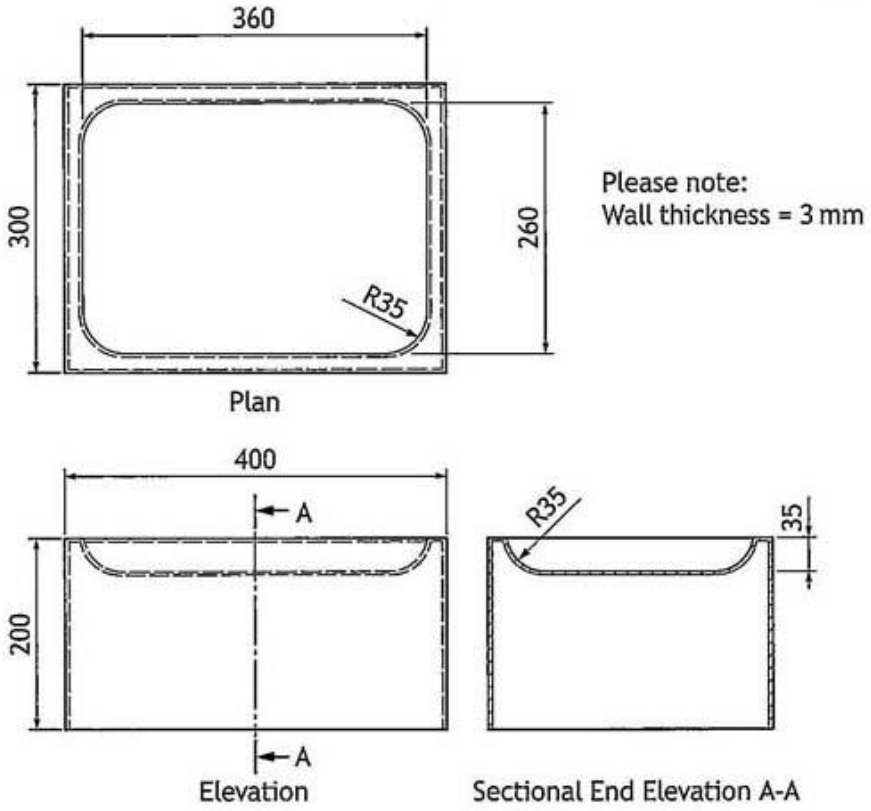
(ii) Explain why this is an appropriate type of informational graphic to present. 1

as it is percents so it will be easier to read.

**3.** A modular lighting system is shown below. There are three sizes of coloured lighting pods that can be arranged in a variety of ways. A rendered 3D CAD illustration is shown below.



An orthographic drawing of one of the orange lighting pods is shown below.

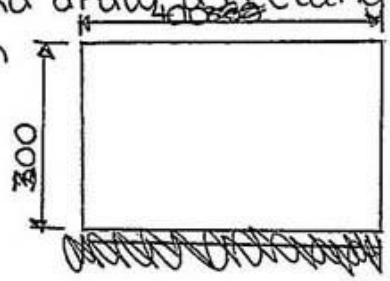



Please note:
Wall thickness = 3 mm

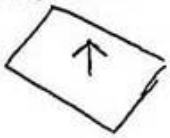
**3. (continued)**

(a) Describe, using the correct dimensions and 3D CAD modelling terms, how you would use 3D CAD software to model the orange lighting pod. You may use sketches to support your answer. **6**

1) create a sketch and draw a rectangle to dimensions shown 400mm x 300mm

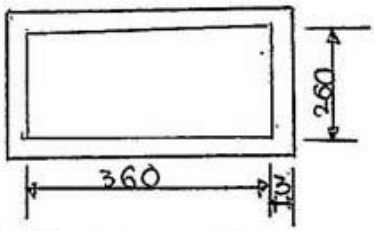



2) extrude by 200mm

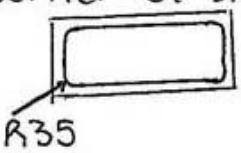


3) create another sketch on the top of rectangle

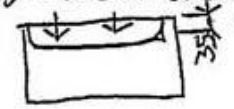
4) draw a rectangle to dimensions shown in profile below



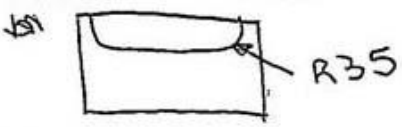

5) Fillet each corner of the new rectangle




6) subtract the rectangle by 35mm

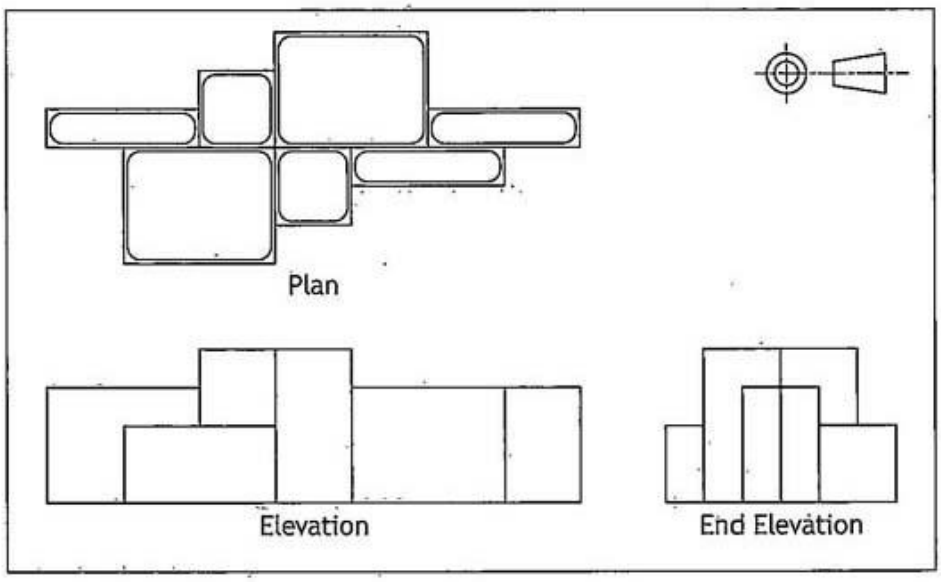



7) fillet the corners at bottom



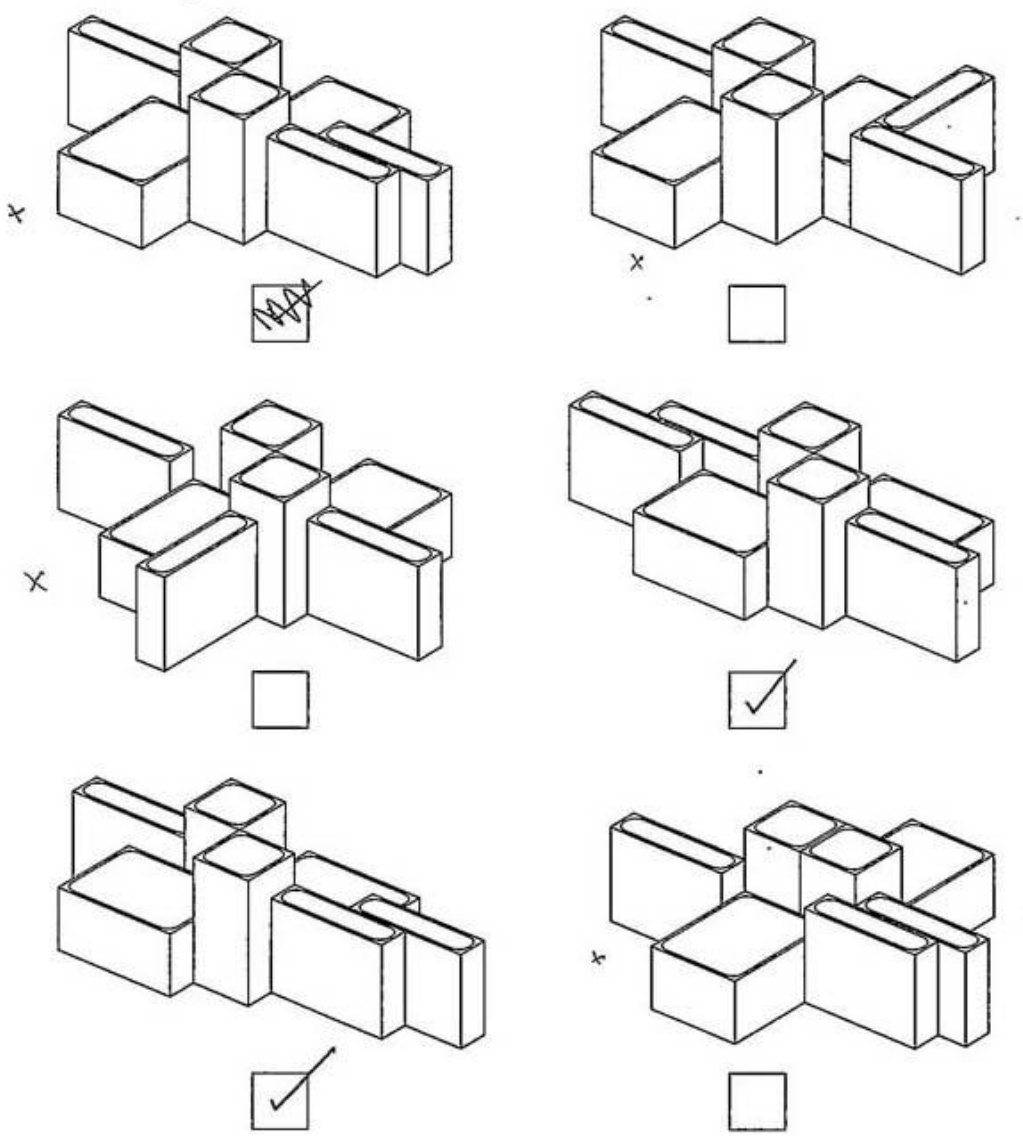
3. **(continued)**

Orthographic assembly views of an arrangement of the lighting system are shown below. Hidden detail removed for clarity.



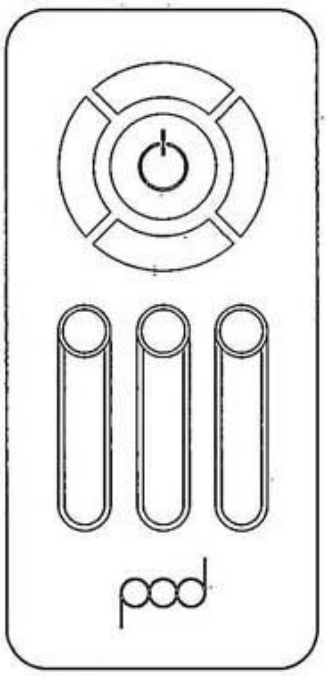
3. (continued)

(b) Identify, using a tick (✓), the two pictorial assembly drawings that match the arrangement **in the orthographic assembly drawing shown.** 2

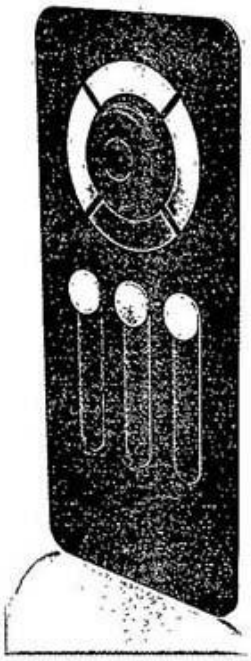


3. (continued)

A 2D CAD line drawing, produced using 2D CAD software, and a 3D CAD model of a control panel for the lighting system are shown below.




2D CAD Line Drawing



3D CAD Model

(c) Explain why the 2D CAD line drawing can be produced more quickly than the 3D CAD model of the control panel. 1

as it is quite a simple thing to draw so it is not worth getting the computer and inventor all set up when you could have drawn it in that time.

(d) Describe two benefits of a 3D CAD model over a 2D CAD drawing. 2

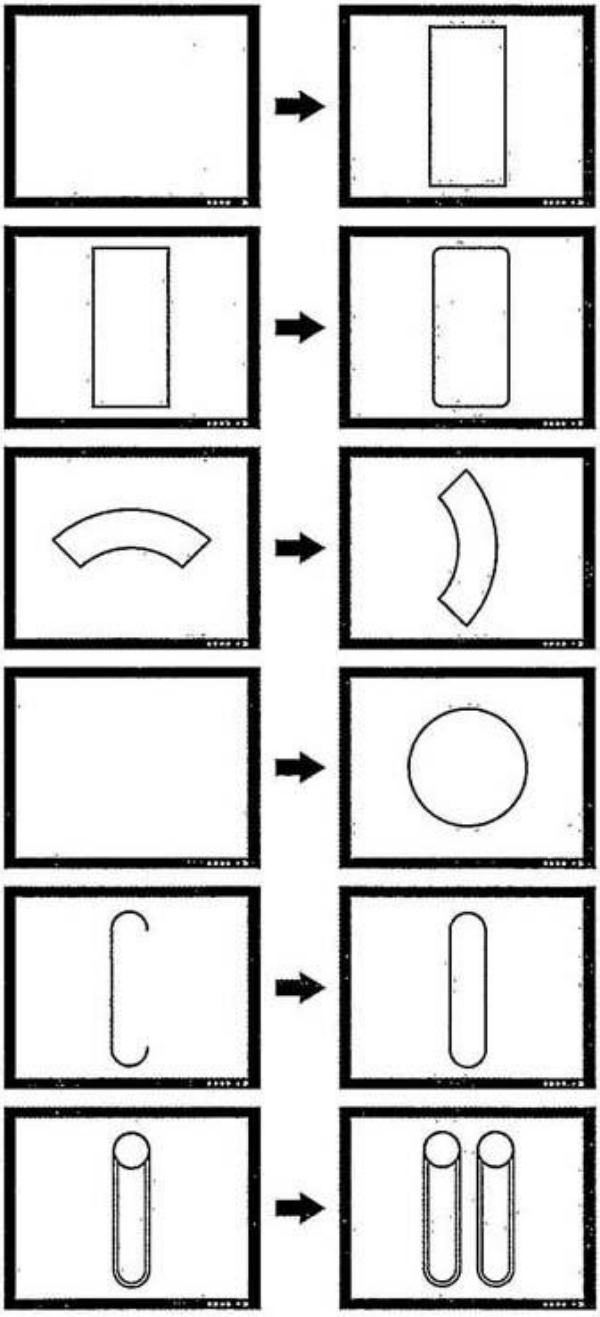
dosent take up as much physical space

nobody needs to be trained for a 2D drawing.

**3. (continued)**

To create the features of the control panel a number of 2D CAD tools were used.

(e) State the name of the **single** CAD tool used in **each case.** 6



(i) Tool used
rectangle

(ii) Tool used
fillet

(iii) Tool used
rotate

(iv) Tool used
circle

(v) Tool used
join

(vi) Tool used
mirror

3. (continued)

Three line types that will be used to complete the 2D CAD drawings to British Standard conventions are shown below.

(f) State the uses of the following line types.

(i) A chain thin line 1



center line

(ii) A continuous thick line 1



out line

(iii) A long dash dotted thin line, thick at ends. 1



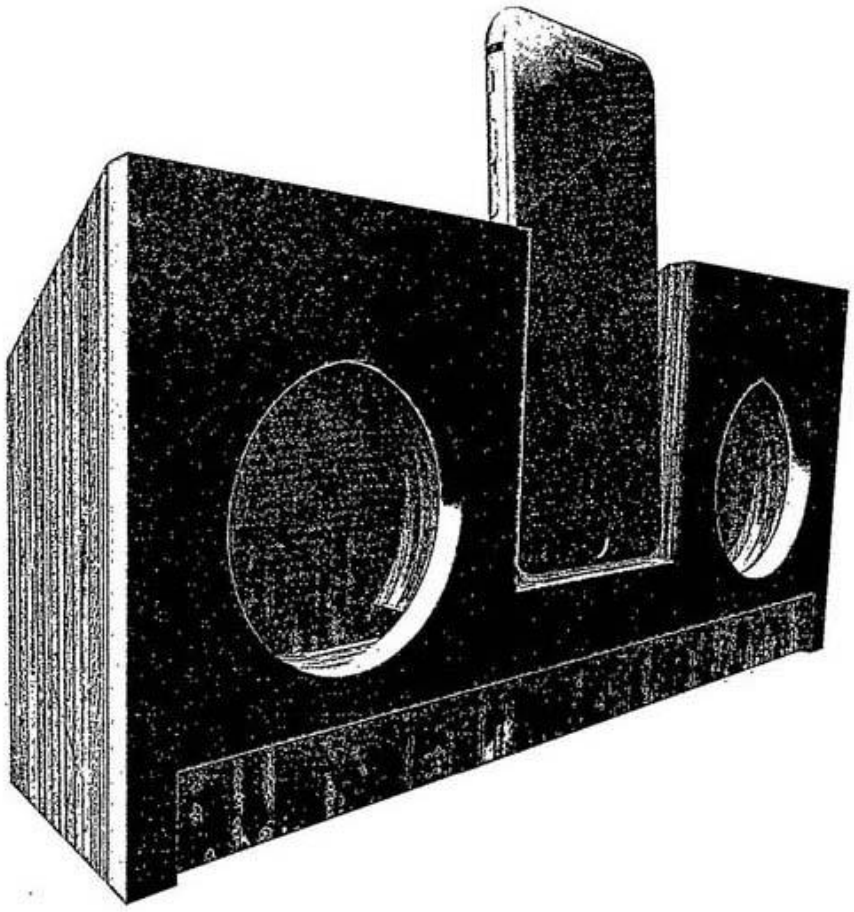
cutting plane

The 2D CAD drawings are to be drawn using a scale.

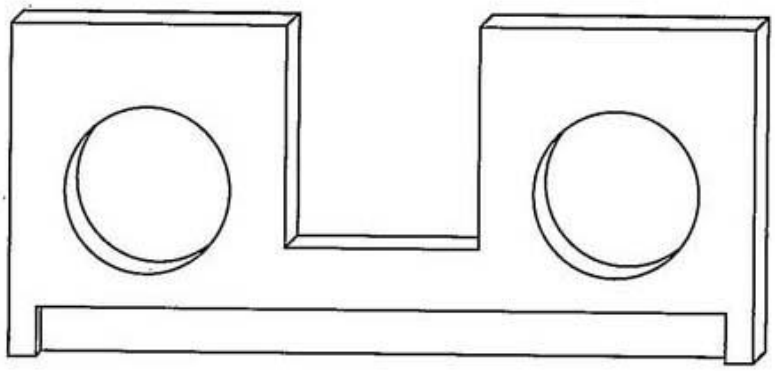
(g) Explain what is meant by the term scale 2:1. 1

For every 1 mm drawn would be 2mm in real life

4. A speaker has been designed using 3D CAD software. A rendered illustration is shown below.



A pictorial view of one of the speaker components is shown below.

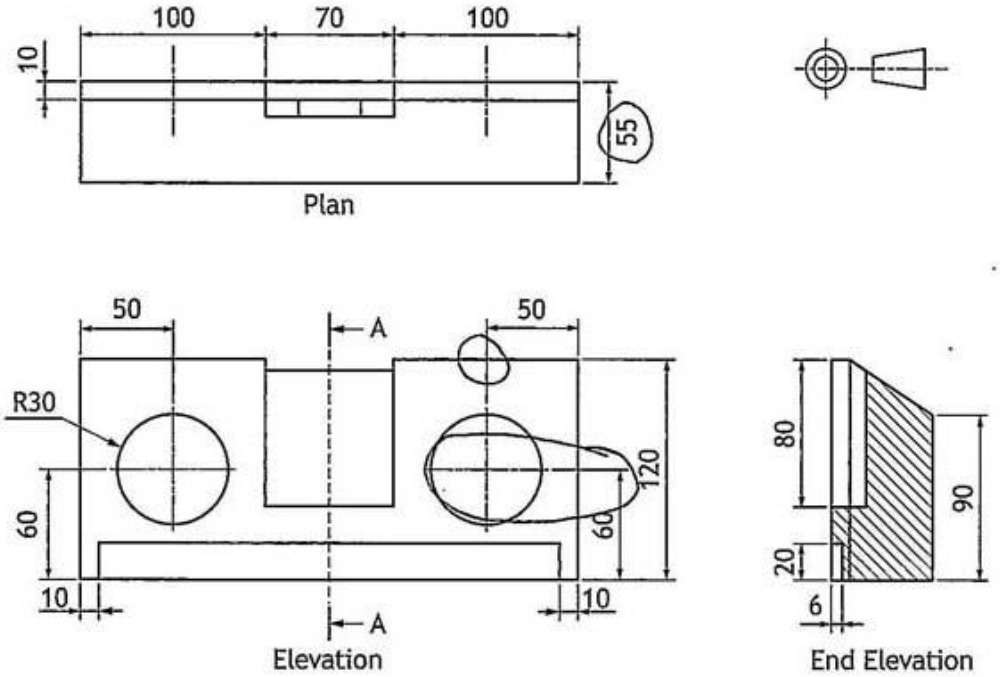


(a) State the type of pictorial view shown above. 1

oblique

4. **(continued)**

A working drawing of the speaker assembly is shown below.




Five pieces of information in the working drawing do not adhere to British Standard conventions.

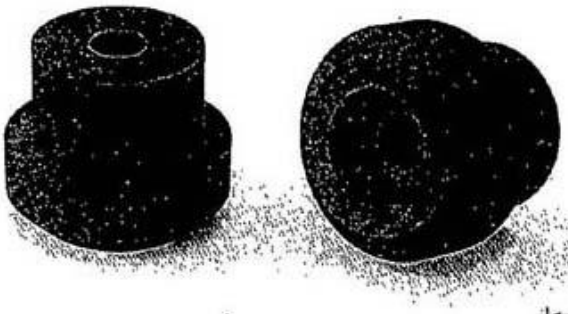
(b) State the five errors found in this drawing. **5**

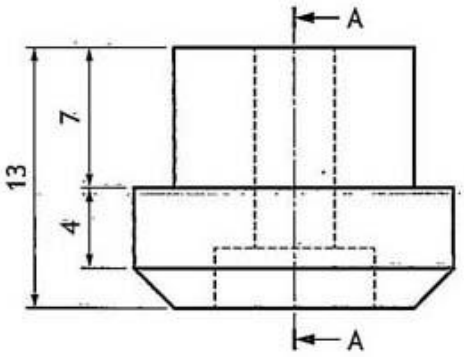
You may annotate the orthographic drawing to support your answer.

1) numbers dimensioned underline
2) projection lines attached to drawing
3) center lines used as projection lines
4) incorrect hatching
5) there is a cutting plane but no sectional elevation.

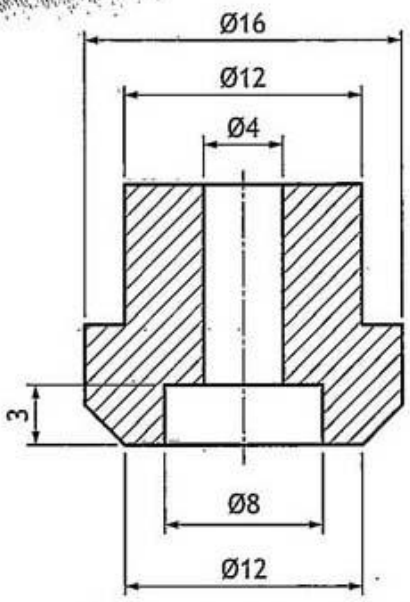
4. (continued)

Rubber feet are to be added to the base. Orthographic views and 3D illustrations of a rubber foot are shown below.






Elevation




Sectional End Elevation A-A

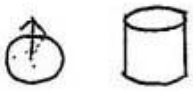
4. (continued)

(c) Describe, using the correct dimensions and 3D CAD modelling terms, how the rubber foot, shown opposite, would be produced. 3

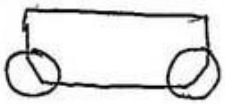
You may use sketches to support your answer.

1) create sketch and draw circle ø16 in center


2) exdrude by 6mm

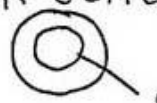


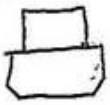
3) chamfer the 2 bottom corners



4) create a sketch on top and draw a circle ø12 in center

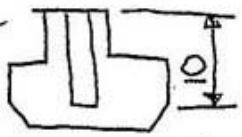
5) exdrude by 7mm



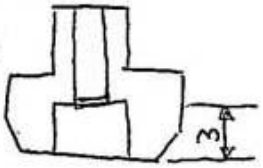
6) create sketch on bit that was extruded and draw circle ø4 in center

7) subtract by 10mm




8) on opposite side (the bottom) draw circle ø8 ø8 in the center

9) subtract by 3mm



4. (continued)

The orthographic drawings of the speaker were shared online.

(d) Describe two benefits of sharing these orthographic drawings online. 2

dont have to wait for it to be delivered through the post

dosent cost any money to share online

(e) Explain why it would be useful to adhere to British Standard conventions and protocols when sharing these types of drawings. 2

(f) Explain the purpose of the following types of production drawings.

(i) Sectional views to show what the inside of a part looks like 1

(ii) Assembly drawings to show the final thing all in one piece. 1

5. Many companies now specialise in applying promotional graphic posters, to advertise services to the public, around commercial vehicles.

A finished layout for a small building company is shown below.

5. **(continued)**

The design work for the layout was produced by a graphic designer.

(a) Describe two ways in which the graphic designer used the following design elements and principles to enhance the layout.

(i) Line 2

line has been used to create depth by having a line behind heading and in front of image.

(ii) Dominance 2

dominance has been used by making the title and ~~in~~ circles the biggest things on the page.

(iii) Colour 2

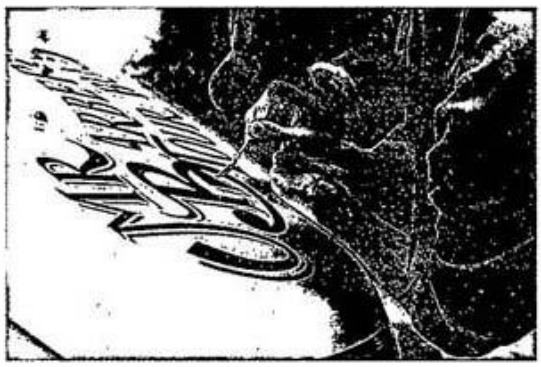
they have used mainly one colour but made different tints of it (e.g blue and a lighter blue).

(iv) Unity 2

unity has been used by having numbers in the background showing it all links together as well as using the same colours throughout.

5. (continued)

Vehicles were traditionally hand painted to include information about a company. Modern processes involve printing promotional graphics which are then applied to a vehicle.



Traditional painting technique

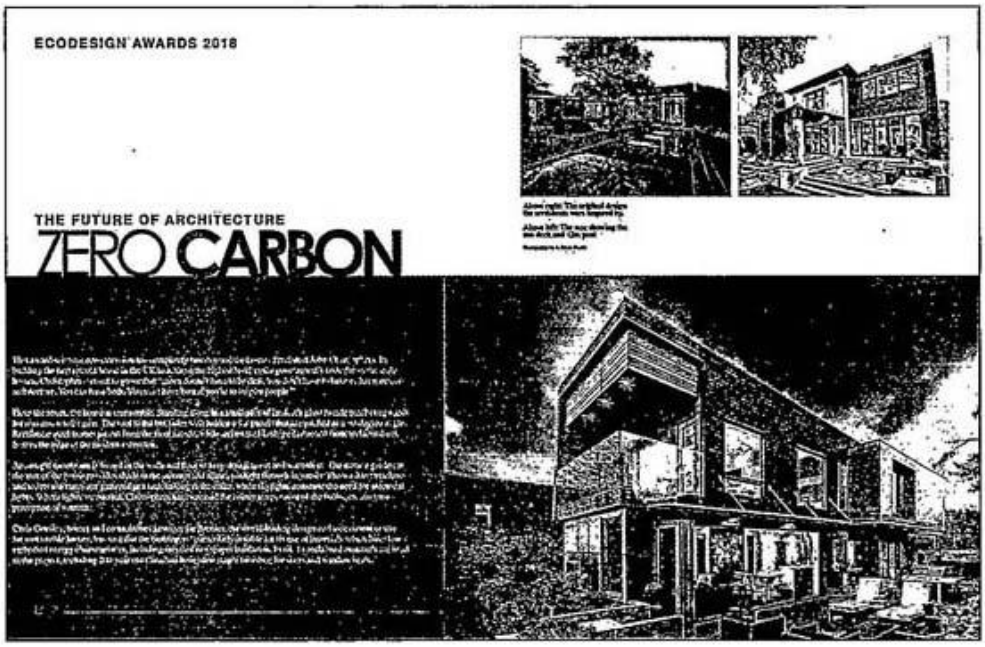
Modern printed technique

(b) Describe two advantages to the client of modern printing techniques over traditional painting techniques. 2

It dosent require as much skill

It speeds the process up alot.

6. A graphic designer submitted a draft layout for an architectural magazine article to the editor. The draft is shown below.




The editor provided some feedback to the graphic designer on how to improve the layout.

(a) Describe, using the feedback shown below, four improvements the graphic designer should make to the layout using **Desktop Publishing techniques.**

(i) *The word 'house' in the heading is difficult to see* 1

use reverse text a light colour on dark background.

(ii) *The large column of extended text makes it difficult to read* 1

(iii) *The bottom image would look better without the sky in the background* 1

use a cropped image

(iv) *The body text is too close to the edge of the paper* 1

align the text with the heading.

6. **(continued)**

The graphic designer used a sans serif font for the heading.

(b) State two reasons why the graphic designer has chosen a sans serif font for the heading. 2

It looks like quite a formal font.

it is a simple ~~bas~~ and easy to read font.

When inserting an image, the graphic designer used the handles of the image to increase its size. This resulted in the image being out of proportion, shown below.

(c) Describe how the graphic designer could have resized the image without altering the proportions. 1

drag the corner of the image.

6. **(continued)**

During the production of the layout, using desktop publishing software, the graphic designer used **guidelines**.

(d) Describe two advantages of using guidelines in the creation of promotional layouts. 2

1) guidlines show you where to put the items on the page so it stops you just placing stuff anywhere

2) it makes the layout look more organised.