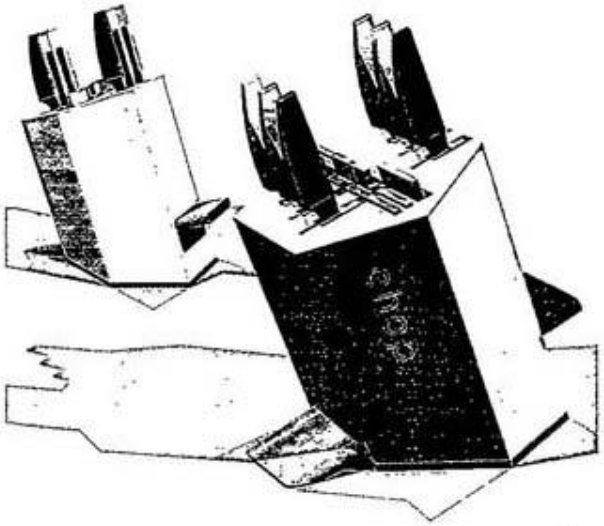
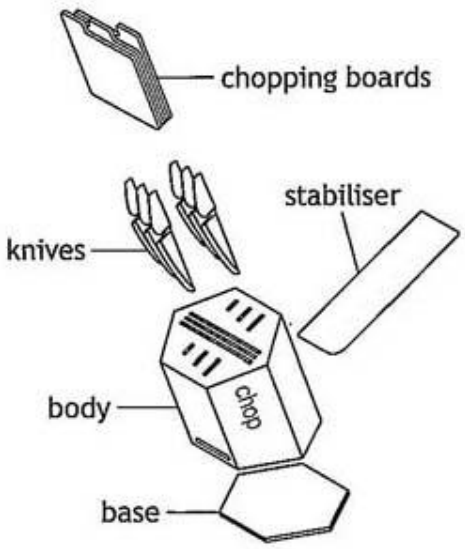
Candidate 6 evidence

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

Sizes and colours are easier to change on a CAD model.

The model can be emailed to anywhere in the world

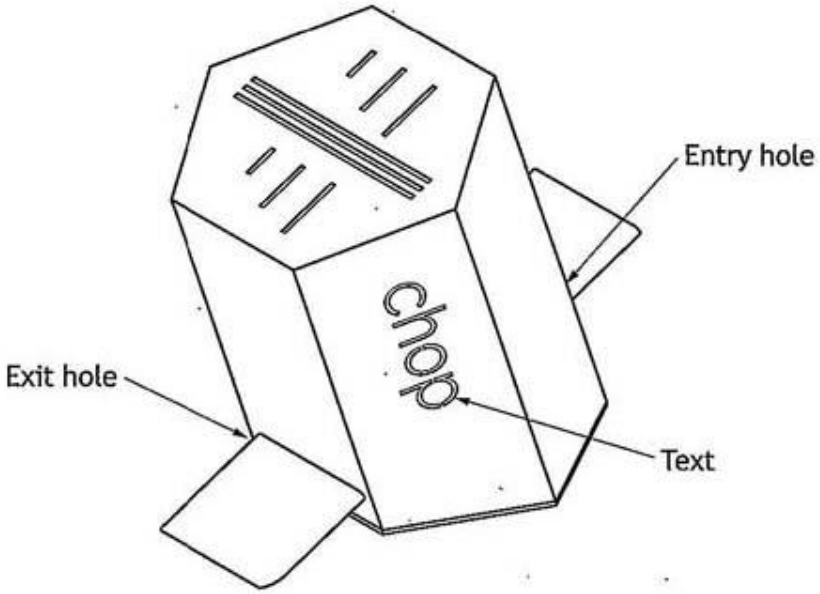
To produce the CAD model the CAD technician was given information about the storage system. One dimension stated: A/F 300mm.

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

Across flats

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.

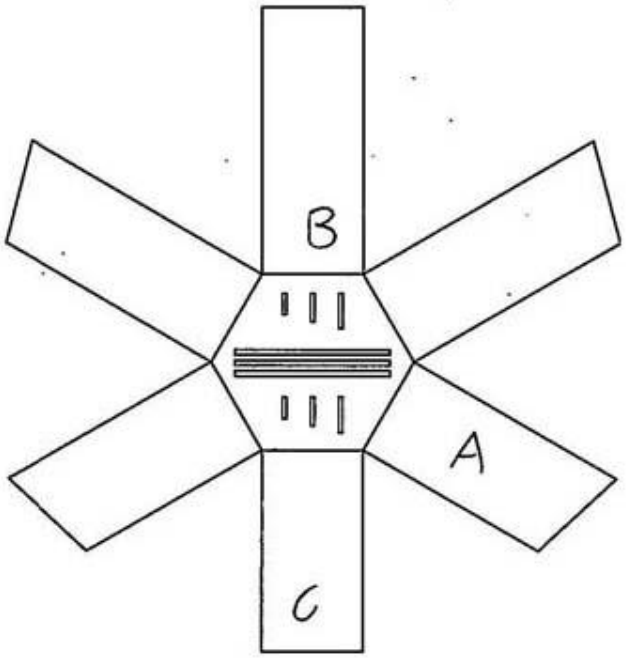


(c) Indicate, on the graphic below, where the Text, Entry hole and Exit hole would be located. 3

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.

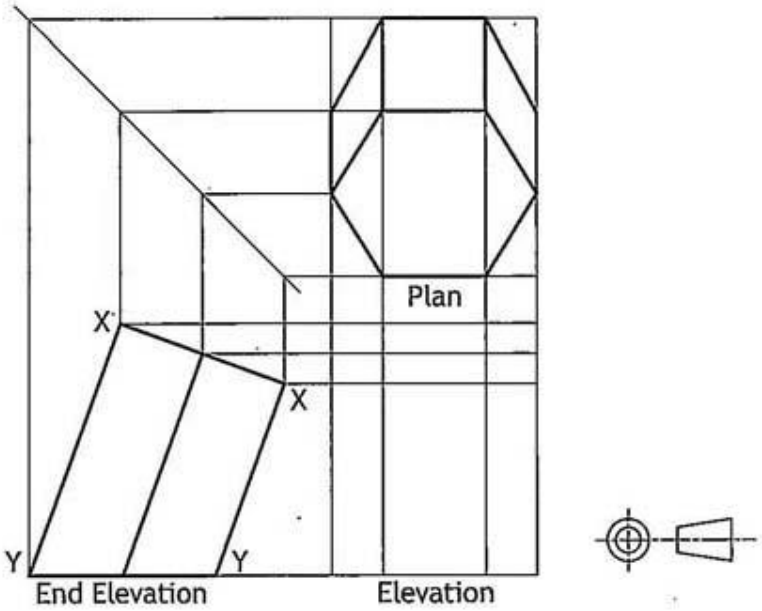
Use **C** to indicate on the panel where the Exit hole would be located.



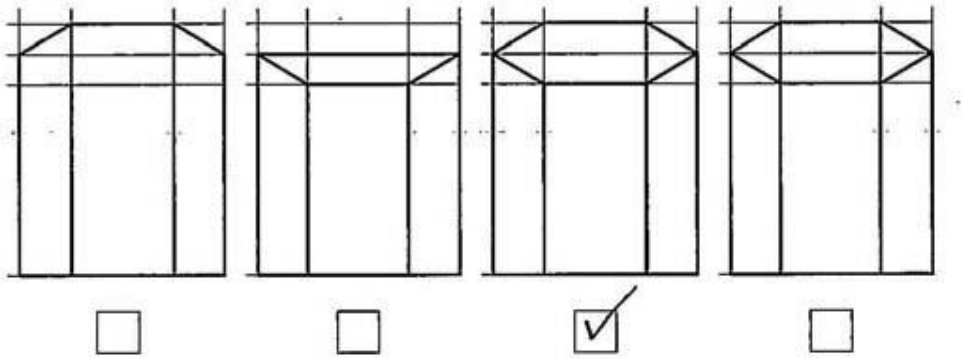
1. (continued)

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.

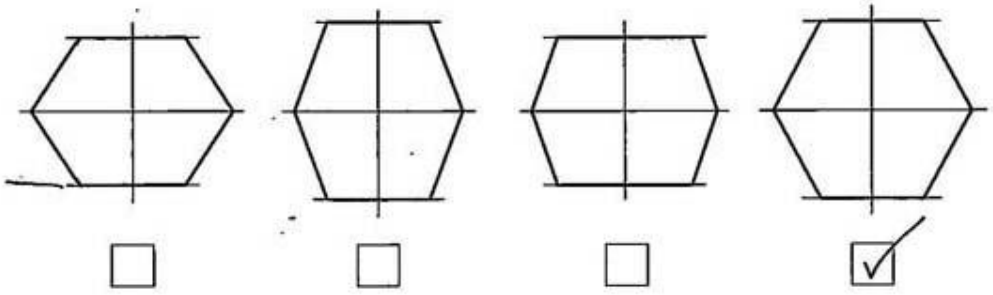


(d) Identify, using a tick (✓), the correct elevation. Ignore wall thickness. 1



A true shape of surface X–X was required.

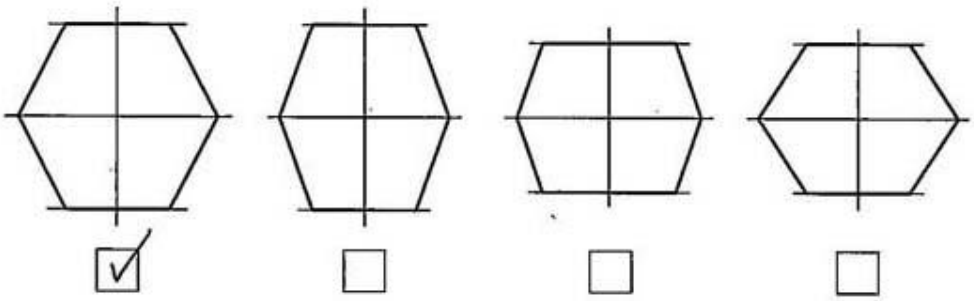
(e) Identify, using a tick (✓), the correct true shape. Use a ruler or trammel to measure. 1



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'.

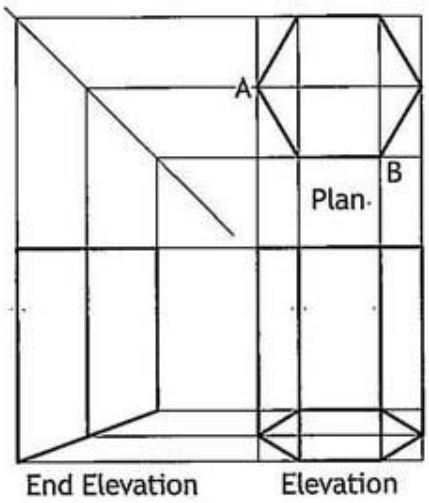
You should refer to the orthographic drawing below.

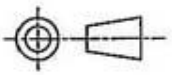
(i) When opened out at generator A, the correct surface development is view. 1

6 *Insert number*

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

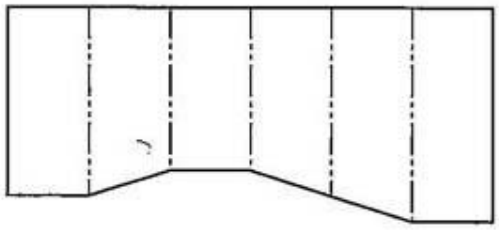
3 *Insert number*



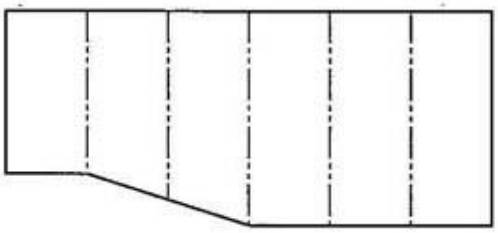


1. (continued)

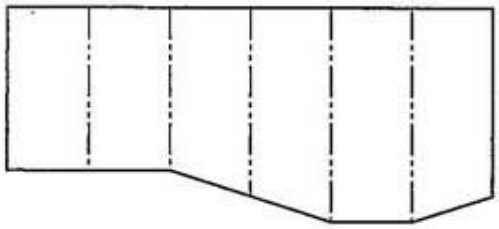
The range of surface developments are show below.



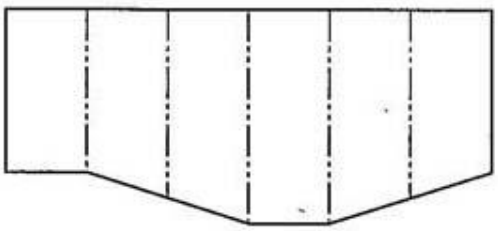
1.



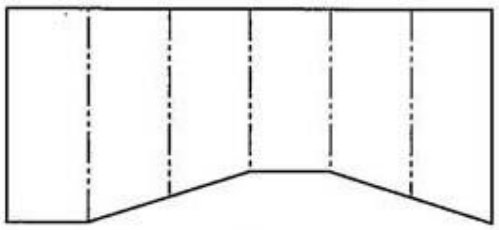
2.



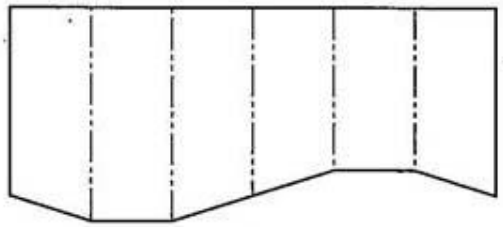
3.



4.



5.



6.

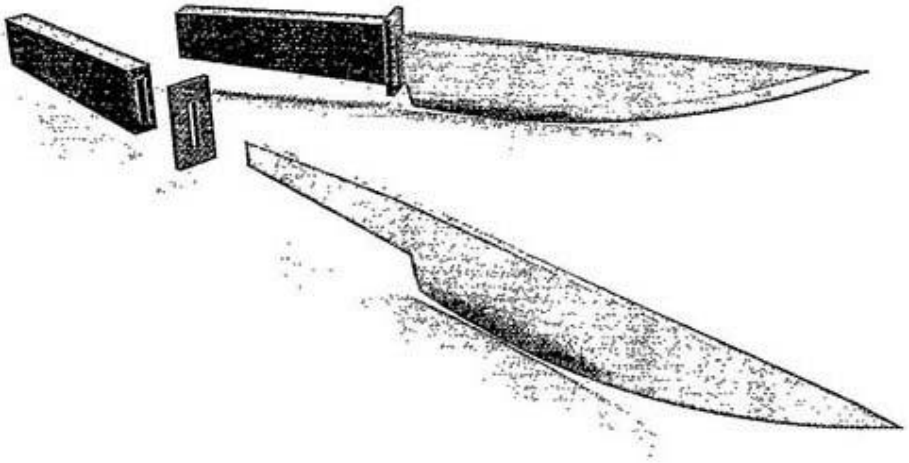
A number of the knife blocks are to be produced from a single sheet of material.

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

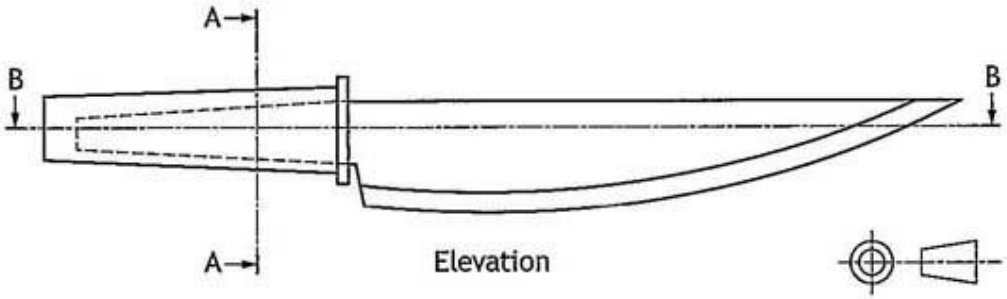
Because the more parts you use the more of a negative impact it has on the environment

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.

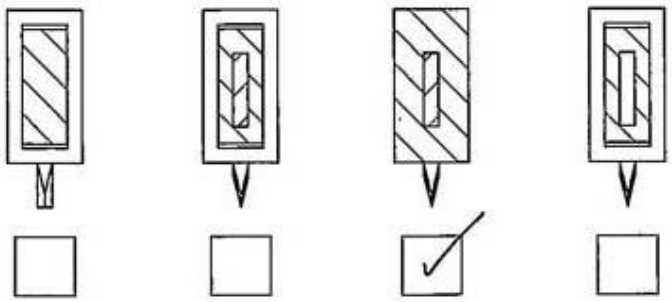


Plan



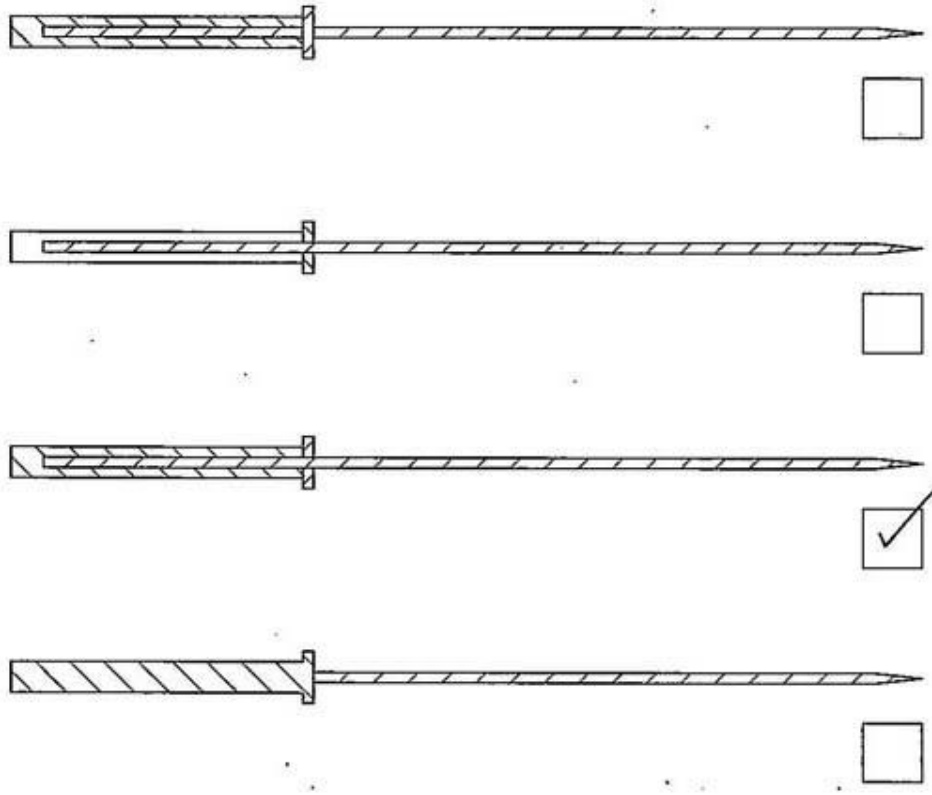
Elevation

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

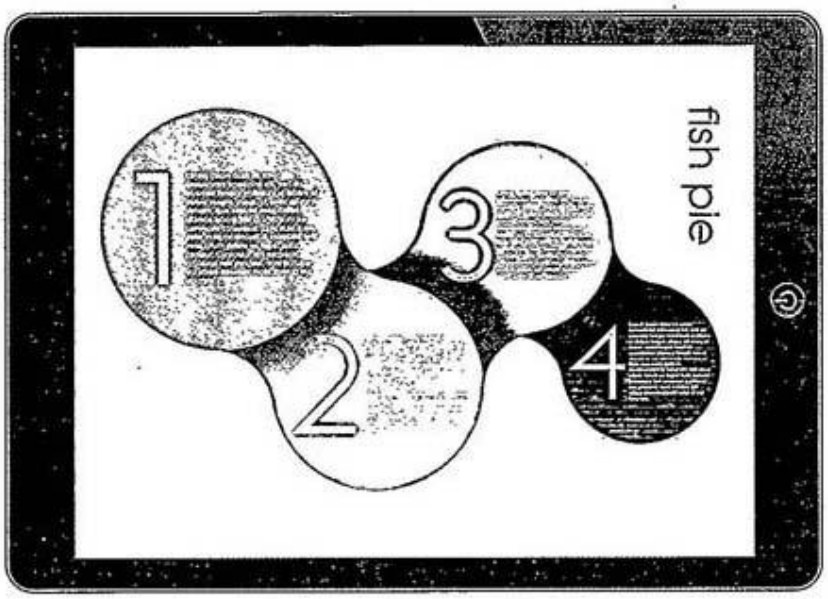


1. (i) (continued)

(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

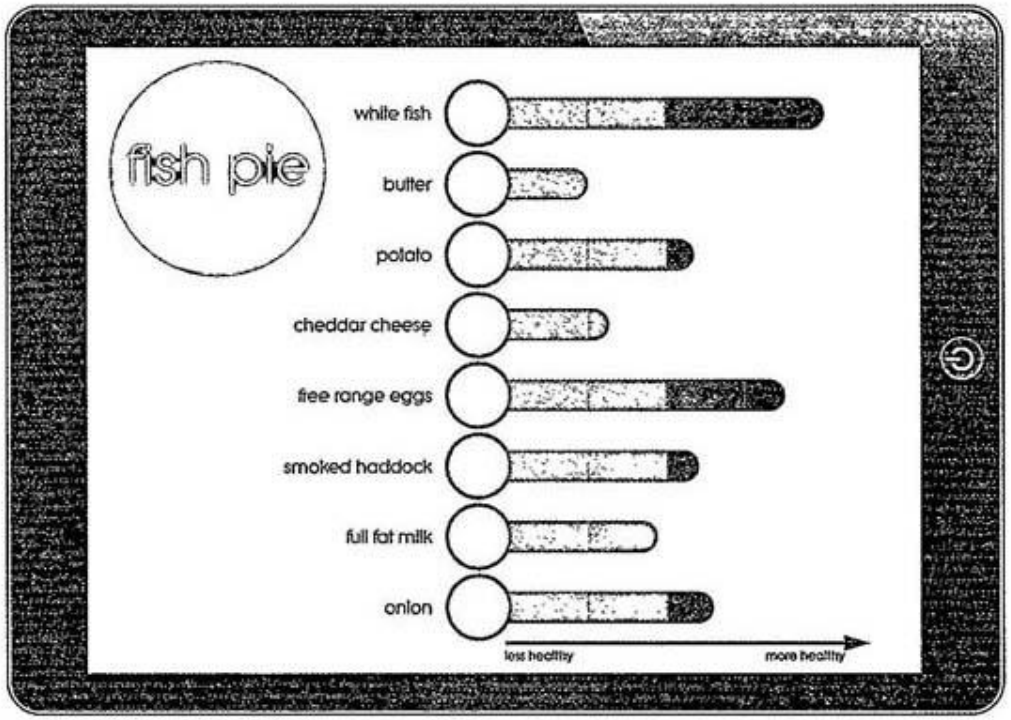
The designer has used depth and put the 1st step closest to you and the last step furthest away. The designer has also used colour to communicate the sequence as your eye is drawn to the brighter colours first. They have also put the first step on the left side which is where you naturally first look.

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

One benefit is that no paper is used. Another benefit is that there is no transportation required to deliver anything

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 chart

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

the graphic artist has used tone of colour to communicate the health ratings

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

Line graph

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

it is good at showing trends

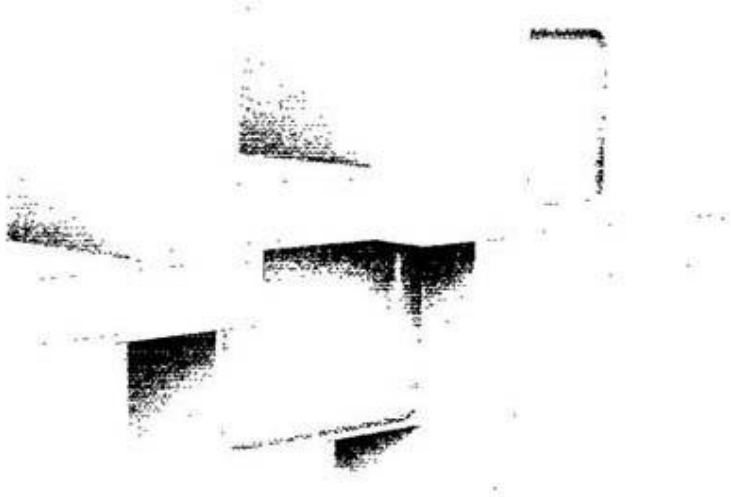
(f) (i) State the most suitable type of informational graphic to present the data in **Statistics B.** 1

pie chart

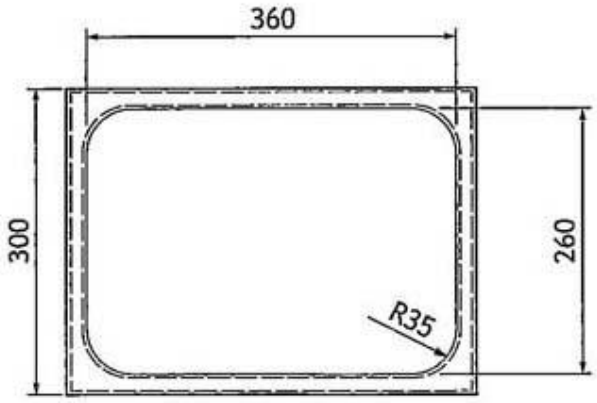
(ii) Explain why this is an appropriate type of informational graphic to present. 1

good at showing percentages

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.

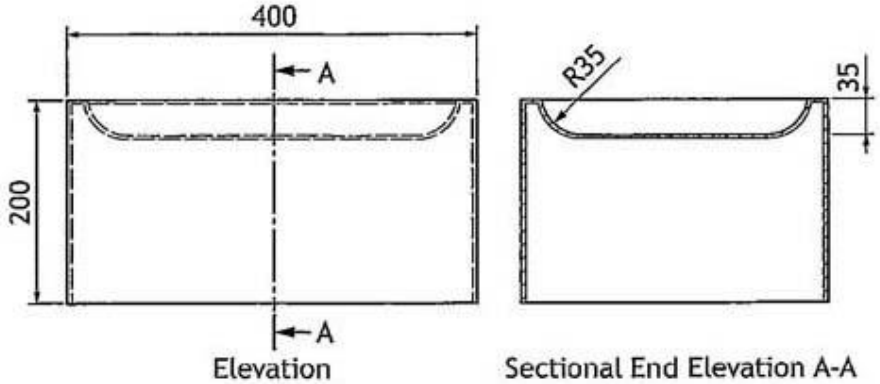


An orthographic drawing of one of the orange lighting pods is shown below.



Plan

Please note:
Wall thickness = 3 mm



Elevation

Sectional End Elevation A-A

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) Sketch a rectangle with dimensions 300x400

2) Extrude rectangle by 200

3) Sketch another rectangle on one of the large surfaces of the existing rectangle with dimensions 360x260

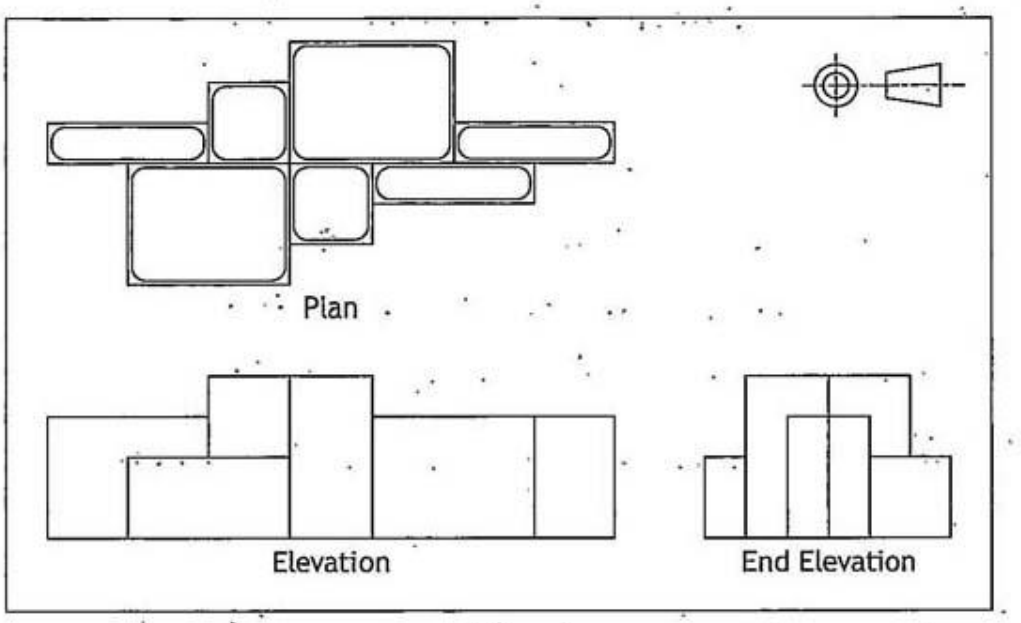
4) Fillet all 4 corners of the new rectangle by R35

5) Extrude subtract smaller rectangle by 35

6) fillet the side walls of smaller rectangle by R35

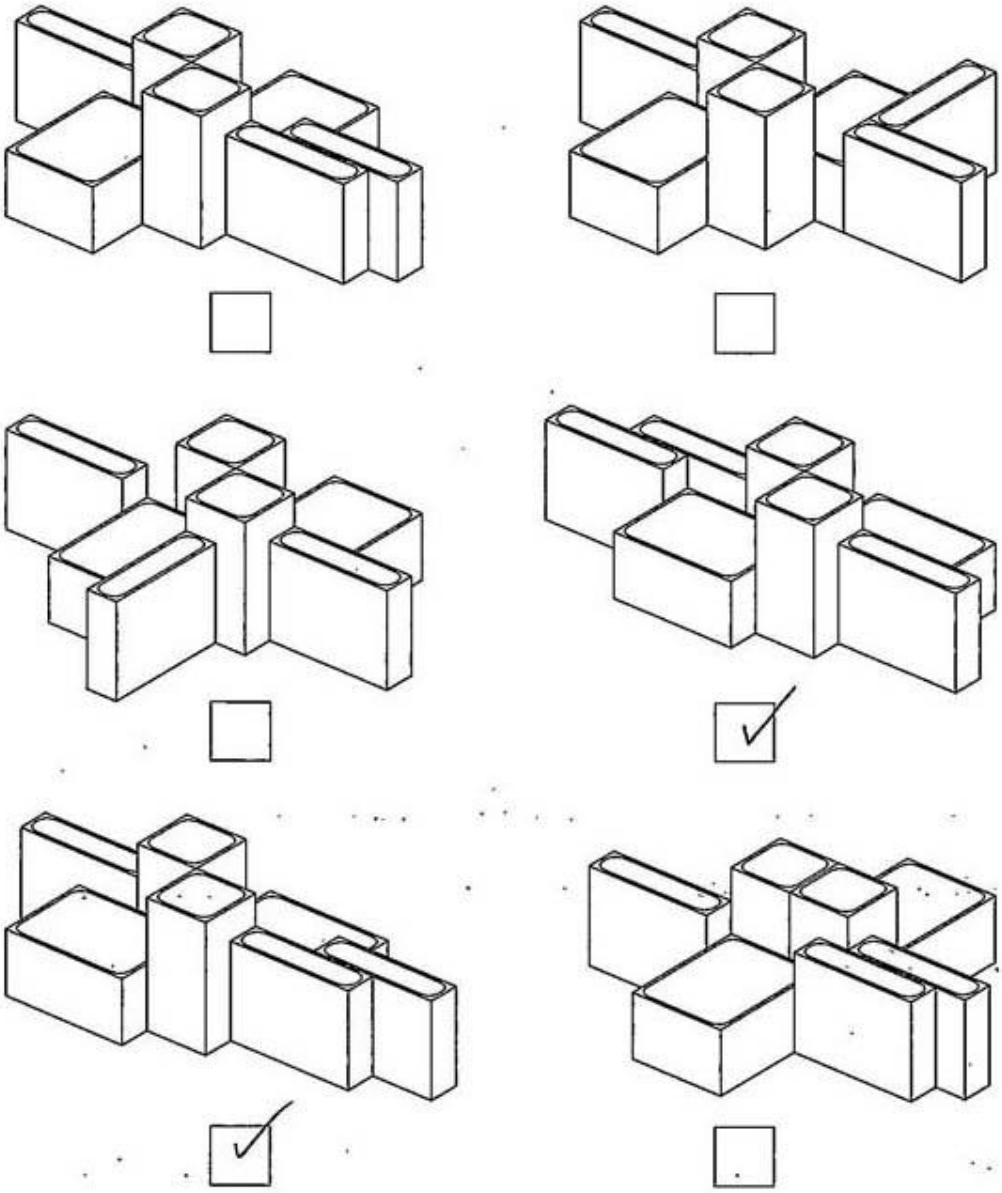
3. **(continued)**

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



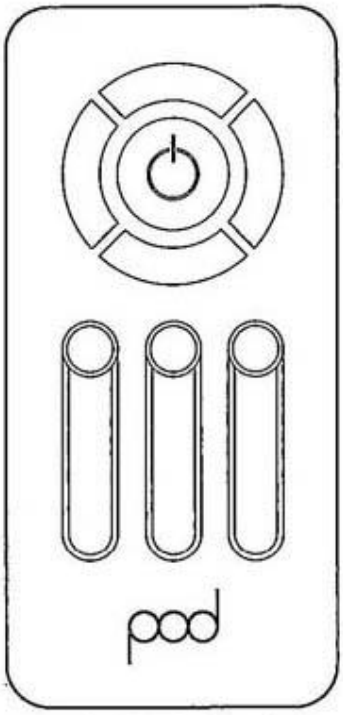
3. (continued)

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

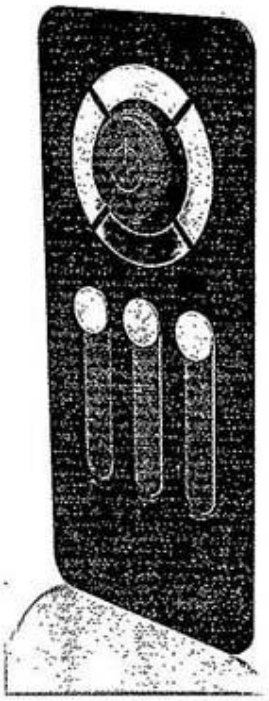


3. (continued)

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

The 2D CAD line drawing can be produced quicker because there are less commands required

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

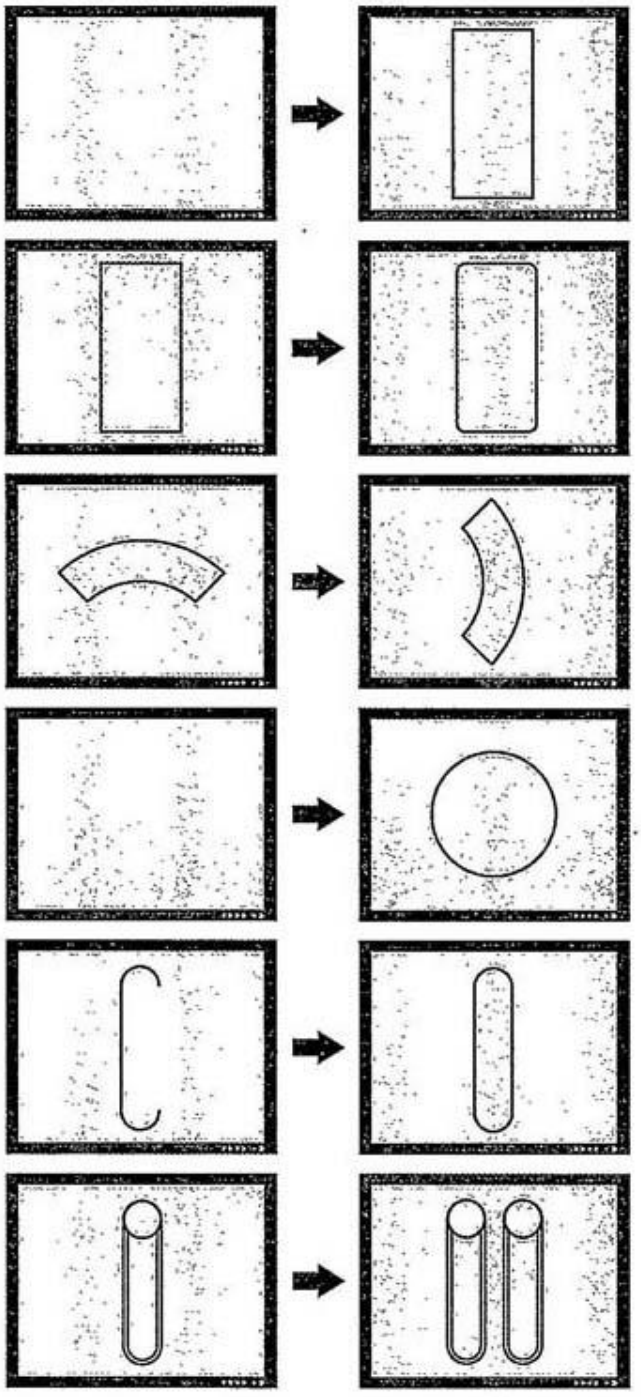
You can view the product from different angles.

You can render it and see how it looks in different lighting

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
line

(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

Centre Line

(ii) A continuous thick line 1

Visible detail

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

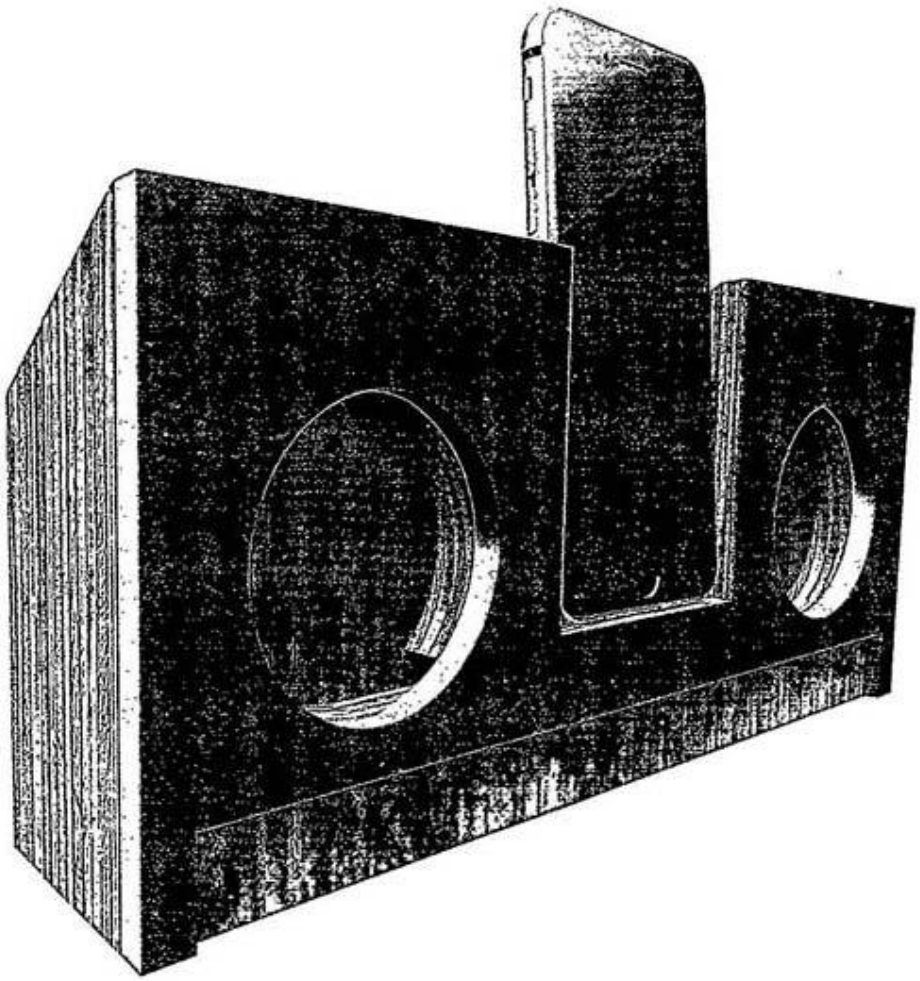
Cutting plane

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

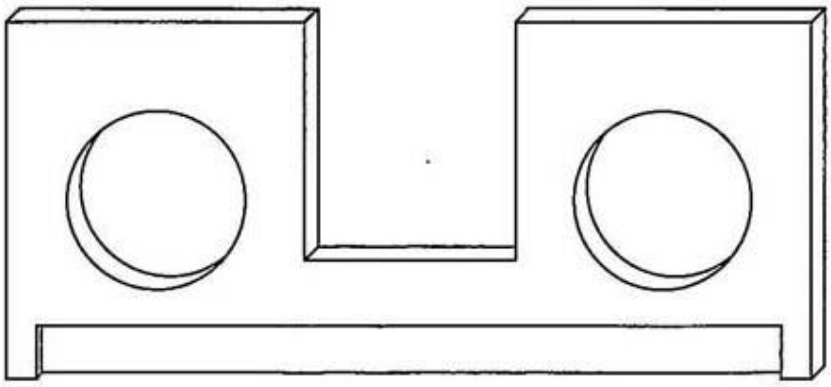
(g) Explain what is meant by the term scale 2:1. 1

This means the drawing is double the size of the product

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.

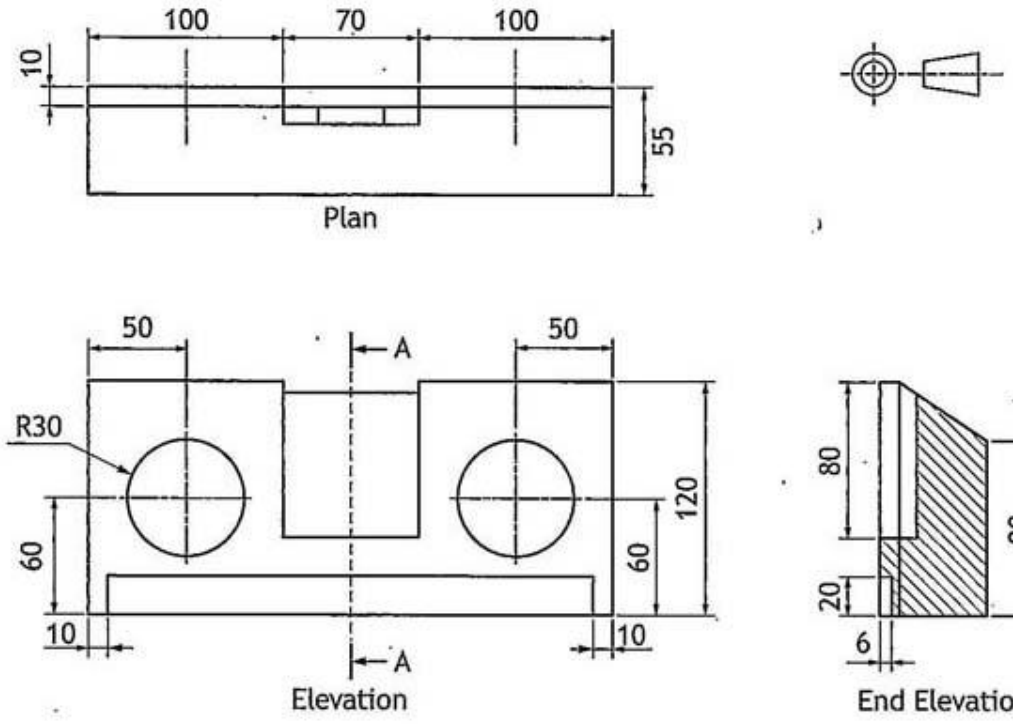


(a) State the type of pictorial view shown above. 1

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.

dimension 55 on plan should be above line

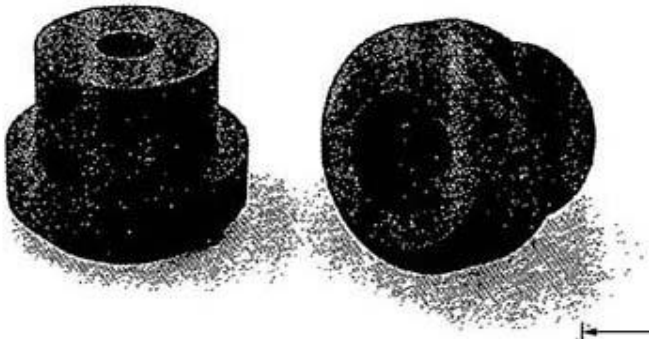
A radius dimension is used on a full circle

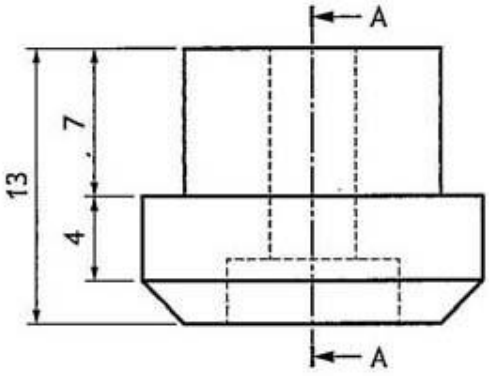
End Elevation is actually a sectional end elevation

Cutting plane line should be long dash then dot

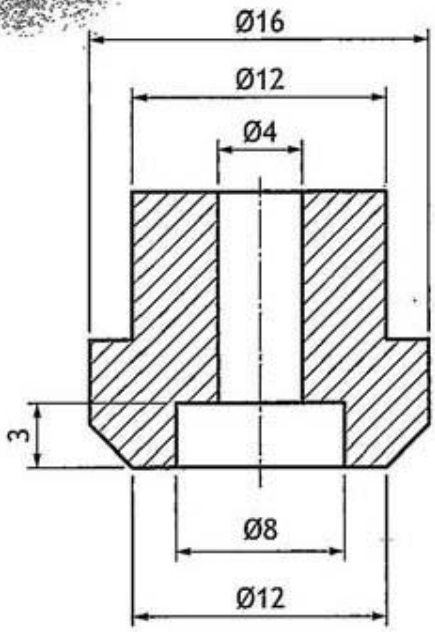
4. (continued)

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) Sketch a circle of [redacted] with Ø16mm
2) Extrude circle by 6mm
3) Chamfer bottom edge of circle by 4mm
4) On the top surface of the circle sketch another circle with Ø12mm
5) Extrude Ø12 circle by 7mm
6) On the top surface of Ø12 circle sketch another circle with Ø4mm
7) Extrude subtract Ø4 circle all the way through the entire part.
8) On the bottom surface of Ø16 circle sketch a circle with Ø8mm
9) Extrude subtract circle by 3mm

4. (continued)

The orthographic drawings of the speaker were shared online.

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

Sharing the drawings online would mean the product could be promoted. Another benefit is that useful consumer feedback could be received.

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

It would be useful to adhere to British Standard Conventions because: A manufacturing company would need to be able to interpret the drawings, And because that is what everyone works to

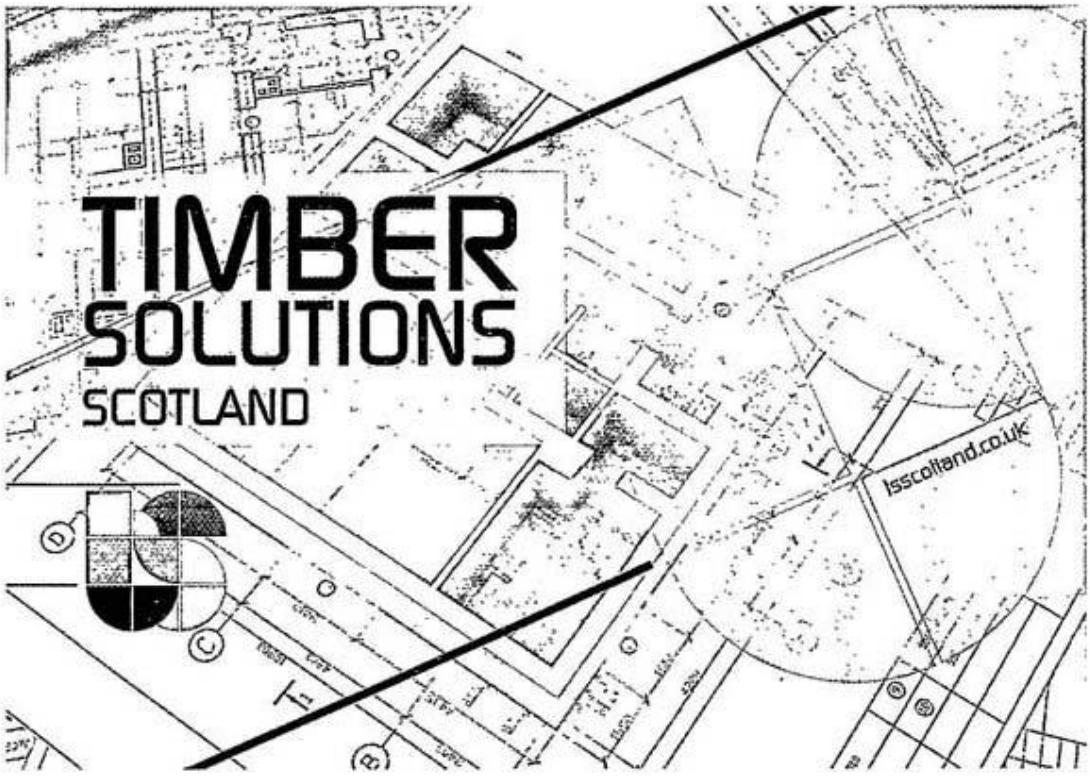
(f) Explain the purpose of the following types of production drawings.

(i) Sectional views show detail on the inside of a part that wouldn't be visible when the part is assembled 1

(ii) Assembly drawings show how the product all fits together 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 is used to seperate different elements on the page.

Line also gives the page a structured look

(ii) Dominance 2

The company name creates dominance so that this is what the eye is drawn to

The logo also creates dominance as this is also a key feature of the page

(iii) Colour 2

The blue and brown contrast each other making the page eye-catching

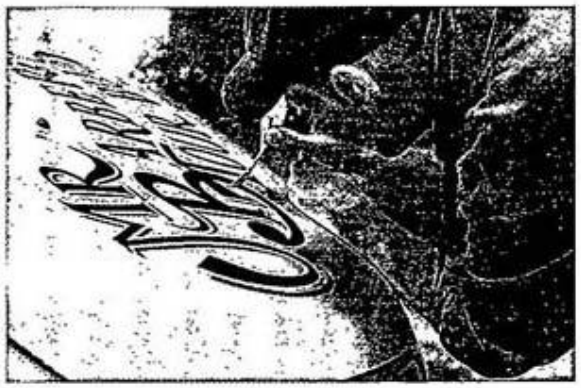
Different tones of blue are used which creates depth

(iv) Unity 2

The different tones of blue create unity. The use of curved shapes also create unity which helps to tie the page together

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.



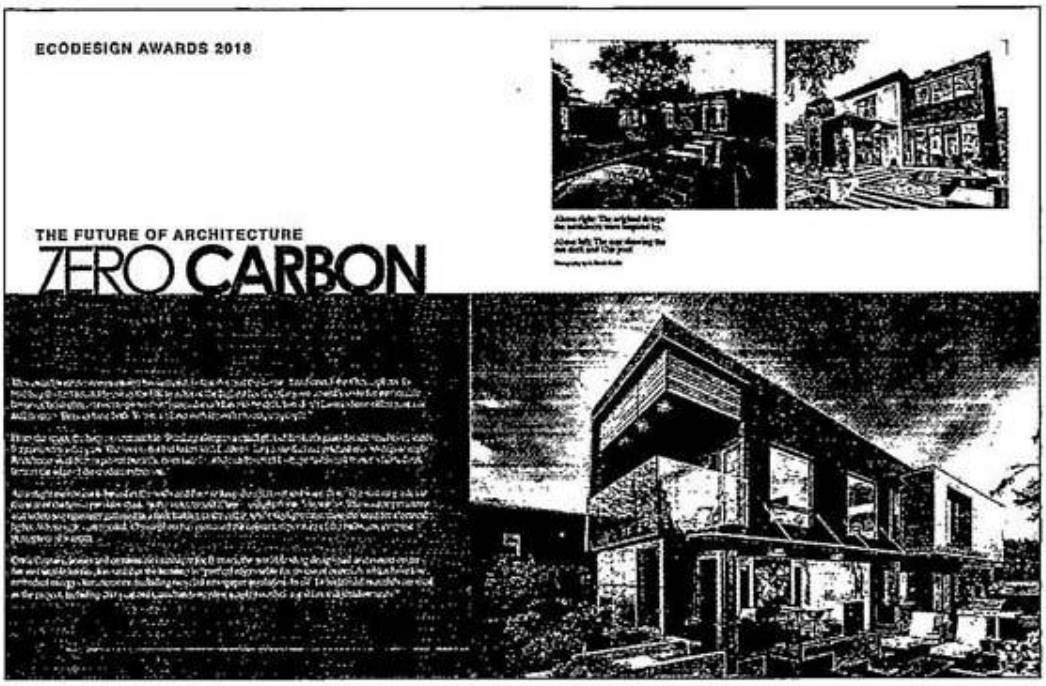
Traditional painting technique

Modern printed technique

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

One advantage to the client is that modern printing techniques take much less time than traditional techniques. Another advantage is that modern printing techniques are often more accurate as there can be no human error.

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

The designer could have used 'reverse' and made the word 'house' white

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

The designer could have used text wrap

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

The designer could have cropped the image

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

The designer should have used a margin

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**

The designer has chosen a sans serif font because : they are easier to read than serif fonts and they are less formal which is good for magazines

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**

The designer could have changed the scale

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

One advantage is that when it prints it will all be on the sheet. Another advantage is that it makes it easier to align elements.