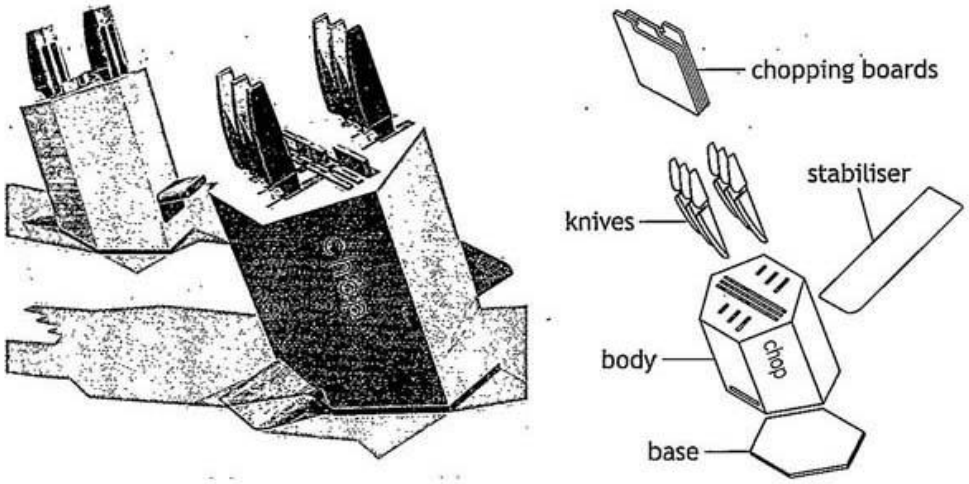
Candidate 8 evidence

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

- Easier to transport ie. via email.
- Easier to modify and create changes to the design.

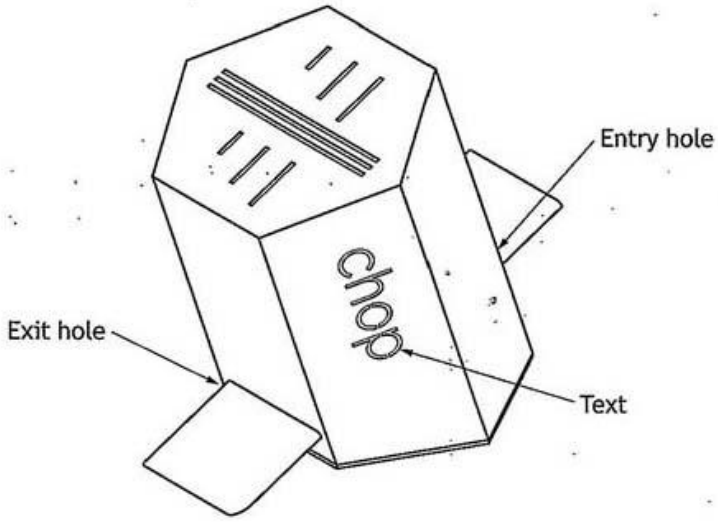
To produce the CAD model the CAD technician was given information about the storage system. One dimension stated: A/F 300mm.

(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.

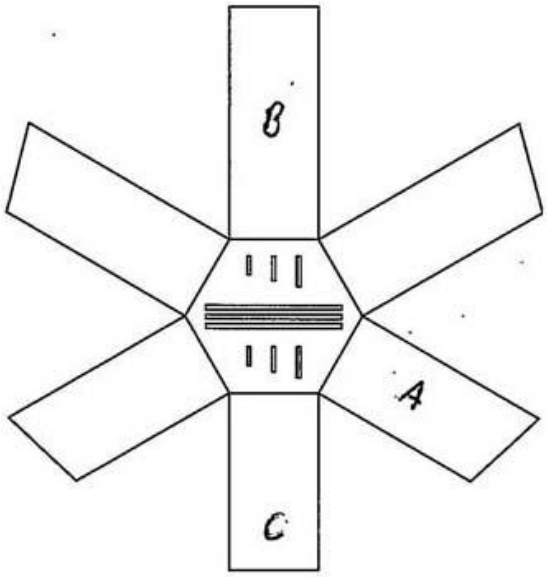


(c) Indicate, on the graphic below, where the Text, Entry hole and Exit hole would be located. 3

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.

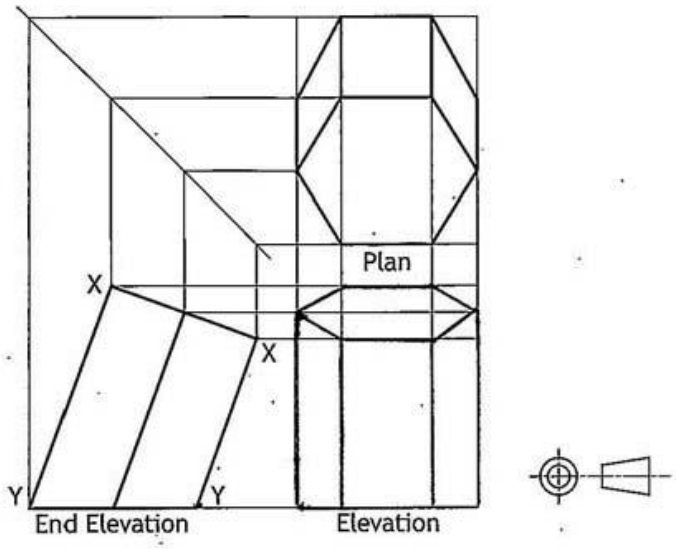
Use **C** to indicate on the panel where the Exit hole would be located.



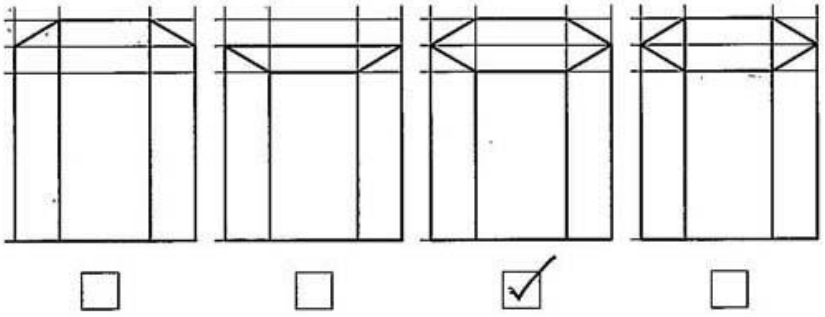
1. **(continued)**

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.

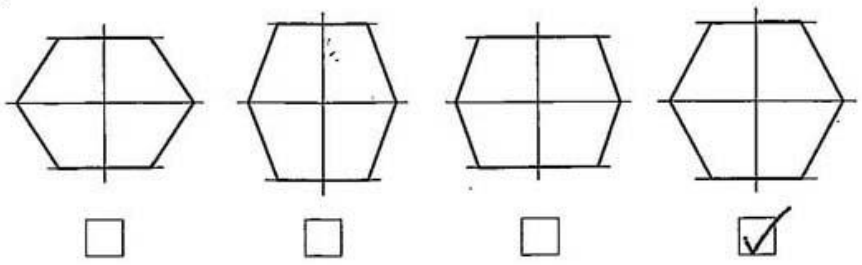


(d) Identify, using a tick (✓), the correct elevation. Ignore wall thickness. 1



A true shape of surface X–X was required.

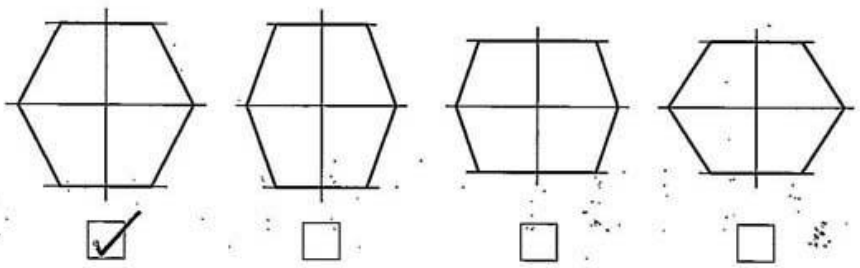
(e) Identify, using a tick (✓), the correct true shape. Use a ruler or trammel to measure. 1



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'.

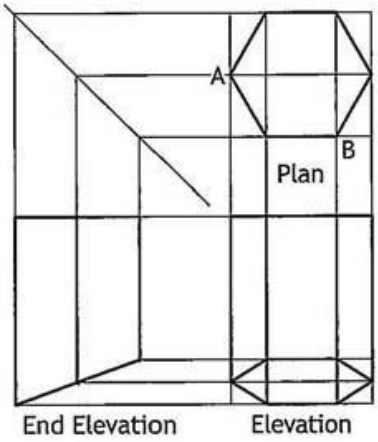
You should refer to the orthographic drawing below.

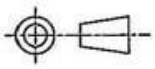
(i) When opened out at generator A, the correct surface development is view. 1

[ ] *Insert number* [6]

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

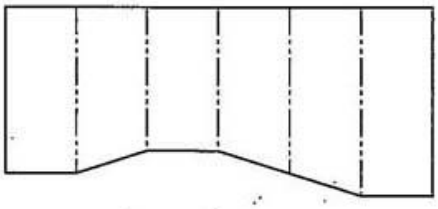
[4] *Insert number*



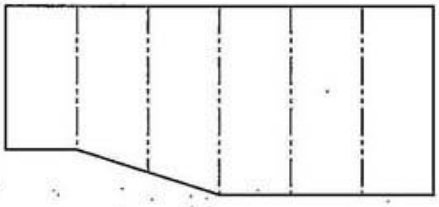


1. (continued)

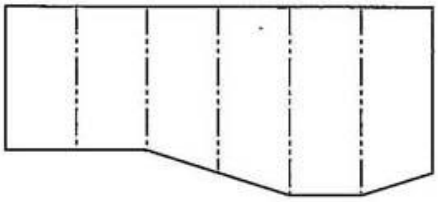
The range of surface developments are show below.



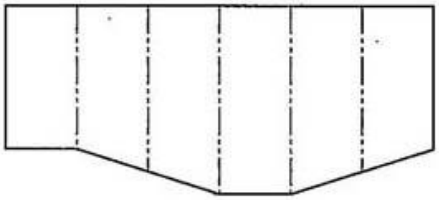
1.



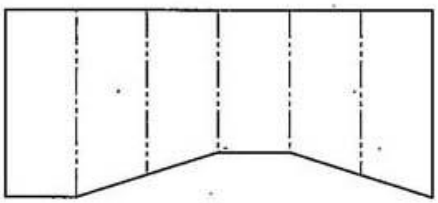
2.



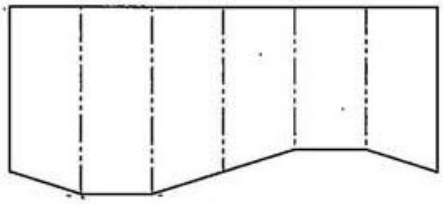
3.



4.



5.



6.

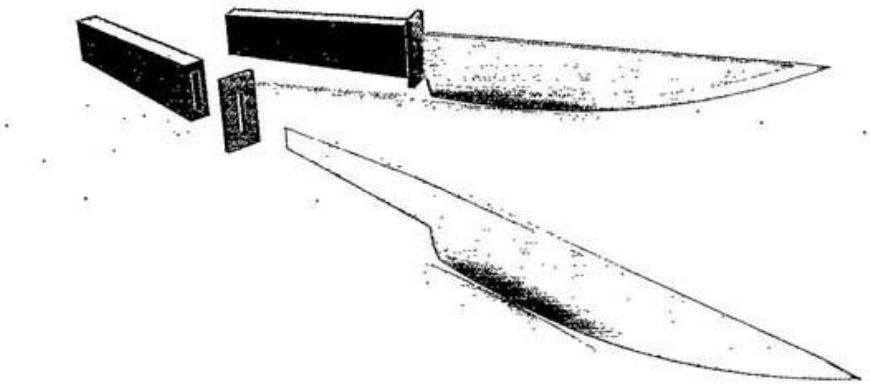
A number of the knife blocks are to be produced from a single sheet of material.

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

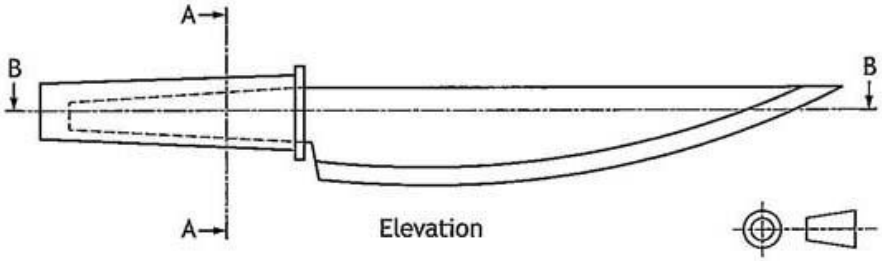
The layout can determine the amount of paper waste, if positioned carefully, there will be less paper waste.

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.

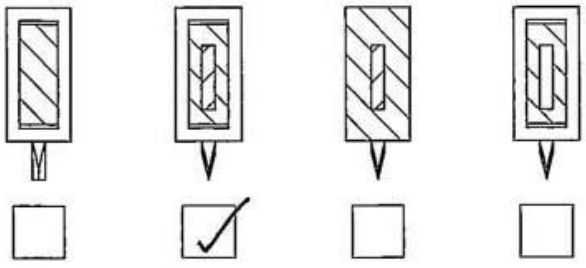


Plan



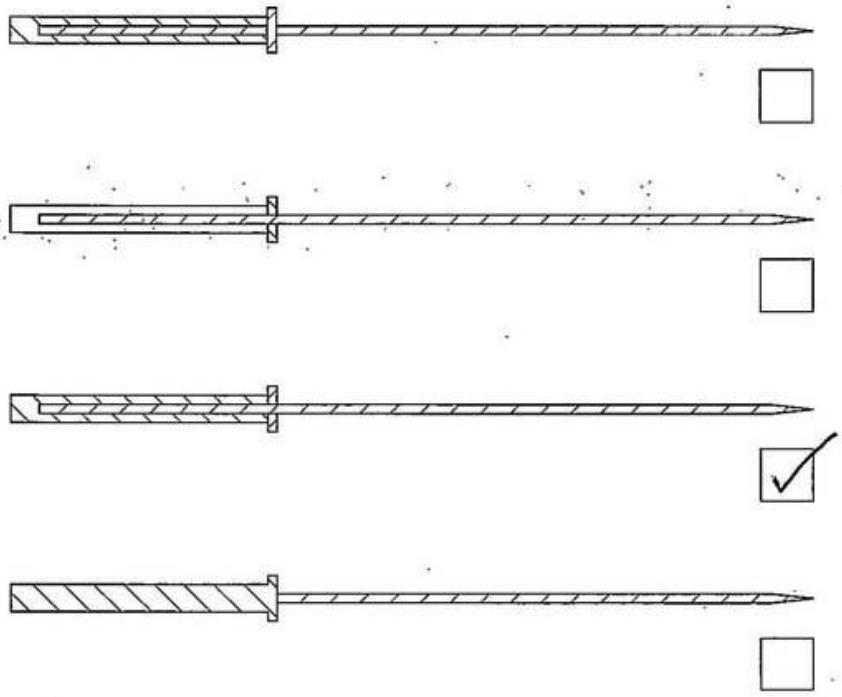
Elevation

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

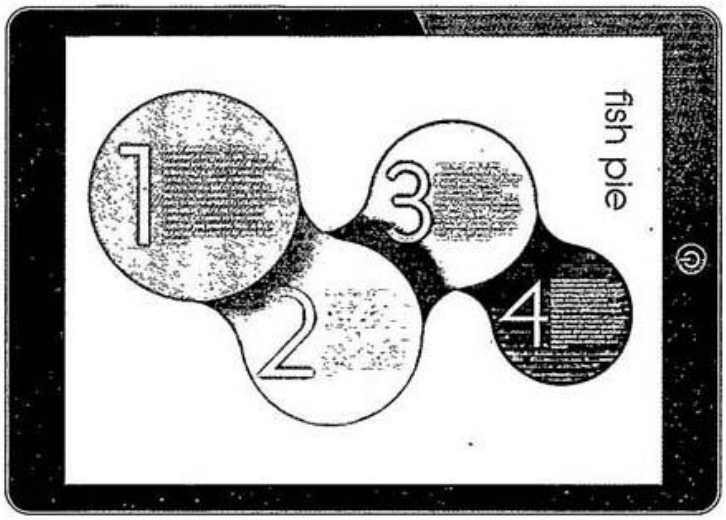


1. (i) (continued)

(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

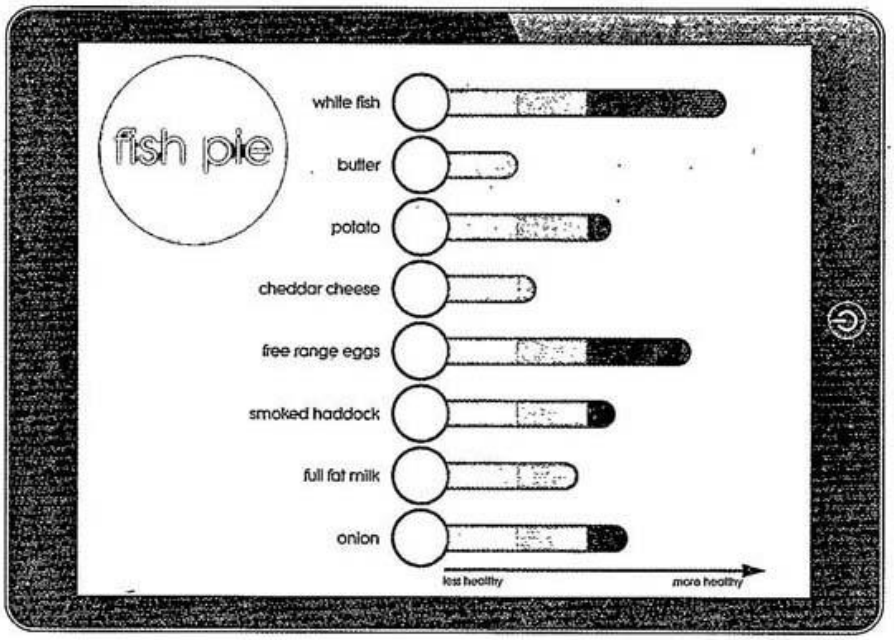
- Connecting the circles one after the other from biggest to smallest. drop
- Creating a shadow to represent stepping down to the next circle.
- Using a sequence of colours from green to red guides through contrast.

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

- No paper waste from the books production.
- No pollution from trucks through distribution of the book.

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/Graph.

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

Using a gradient of the colours ~~green~~ green meaning healthy, the more green it gets the healthier it is.

1

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

Bar Chart/Graph

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

To show different amounts of different things in a similar topic.

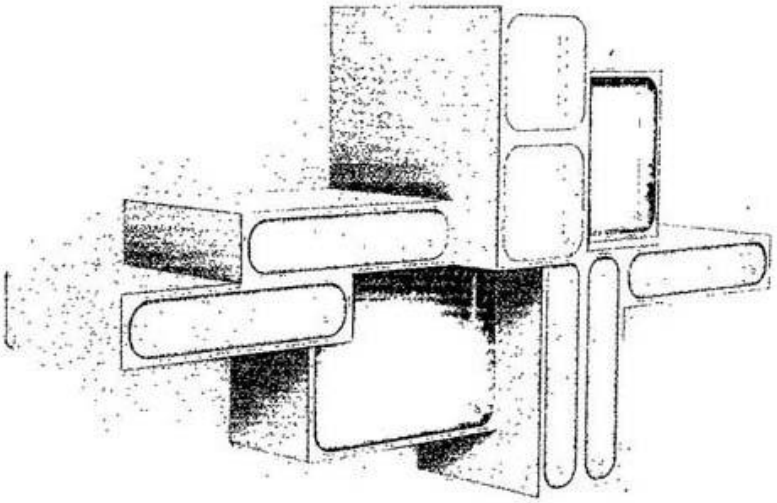
(f) (i) State the most suitable type of informational graphic to present the data in **Statistics B**. 1

Pie Chart

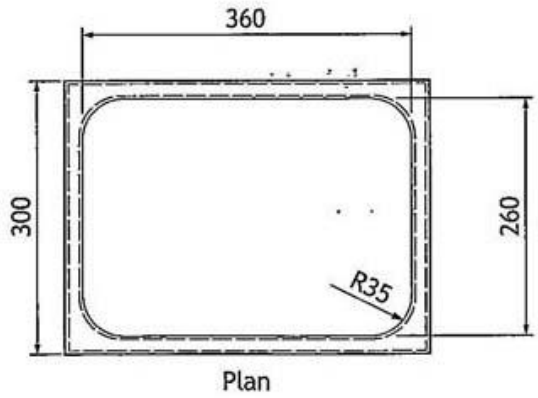
(ii) Explain why this is an appropriate type of informational graphic to present. 1

To show percentages of a whole number or thing.

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.

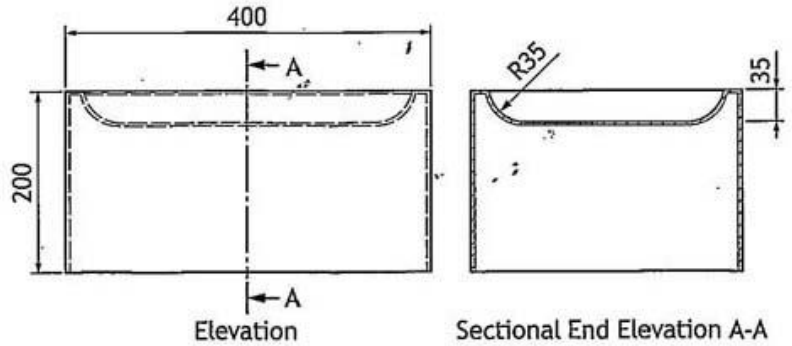


An orthographic drawing of one of the orange lighting pods is shown below.



Plan

Please note:
Wall thickness = 3 mm



Elevation

Sectional End Elevation A-A

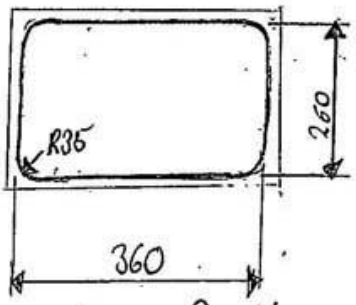
3. (continued)

(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 ~~Create~~ Sketch a 2D Rectangle profile measuring 400mm by 800mm.

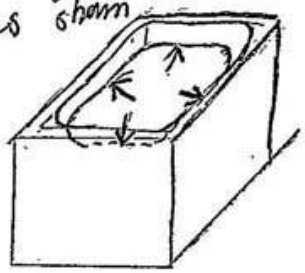
② Extrude the profile by 200mm.

③ Sketch this 2D profile on top of the box.

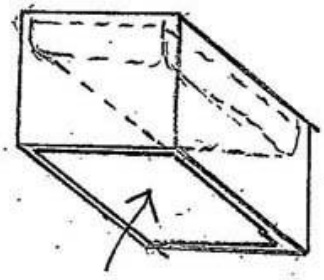


④ Extrude subtract this profile by 35mm

⑤ Fillet the inner edges of the extruded area as shown. Fillet by 35mm

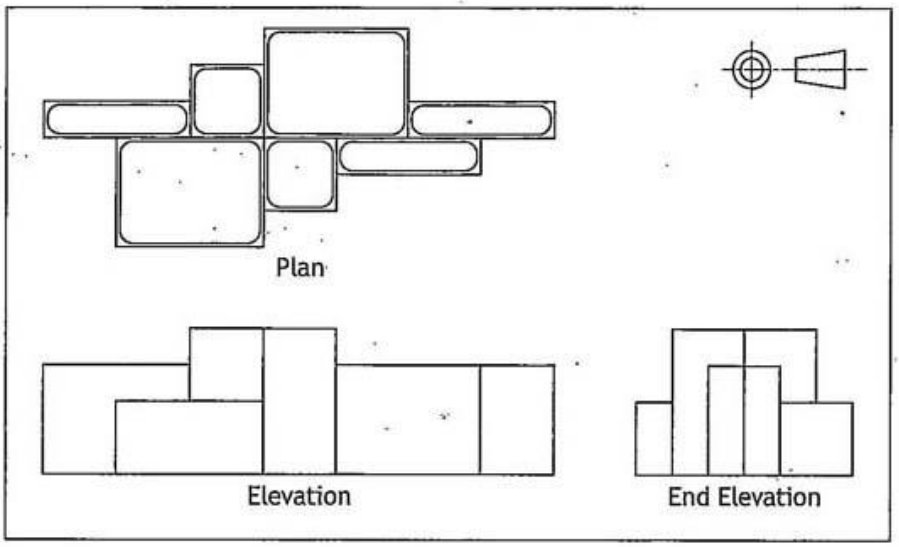


⑥ Shell this box by 3mm and click on the bottom of the box to leave it open



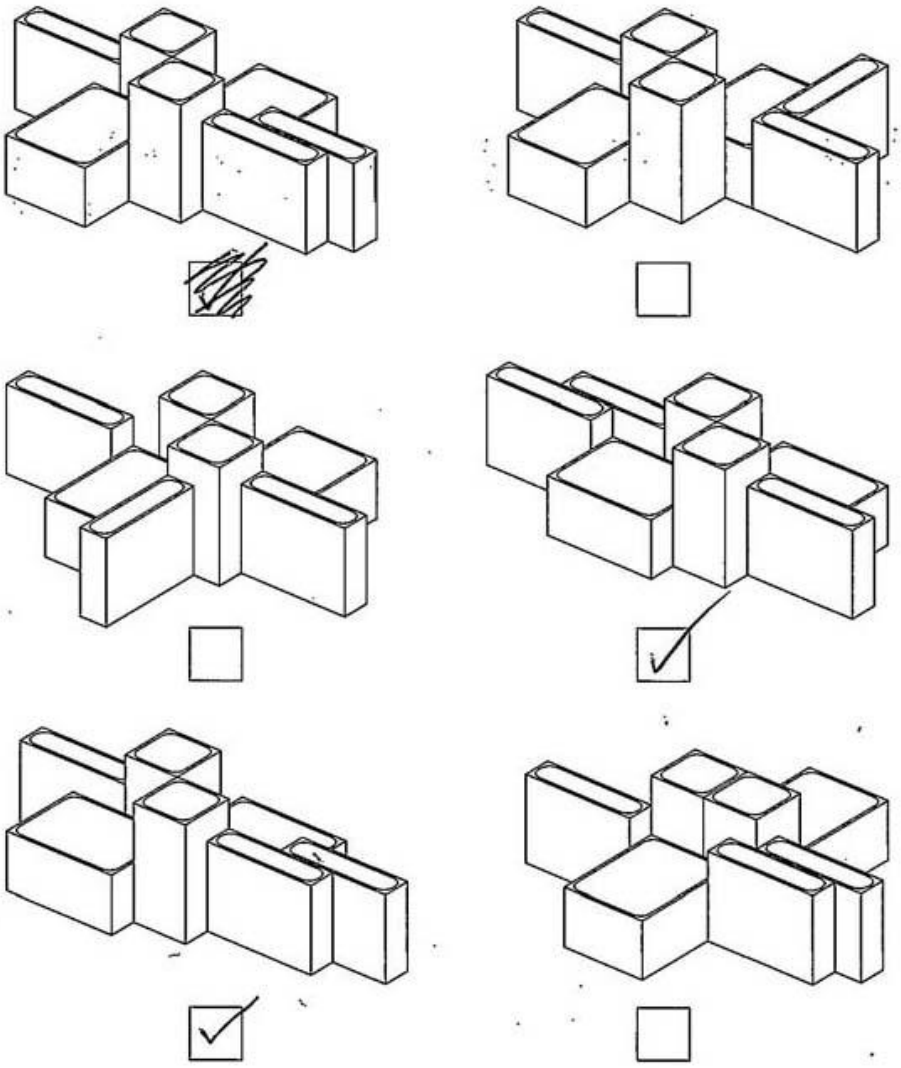
3. **(continued)**

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



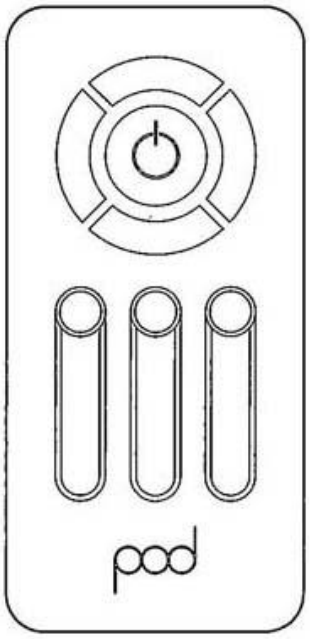
3. (continued)

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

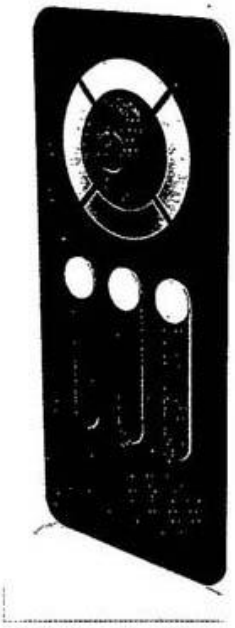


3. (continued)

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

: A 3D Model has another set of dimensions on a new axis a 2D only has 2 axis and therefore less information to put in

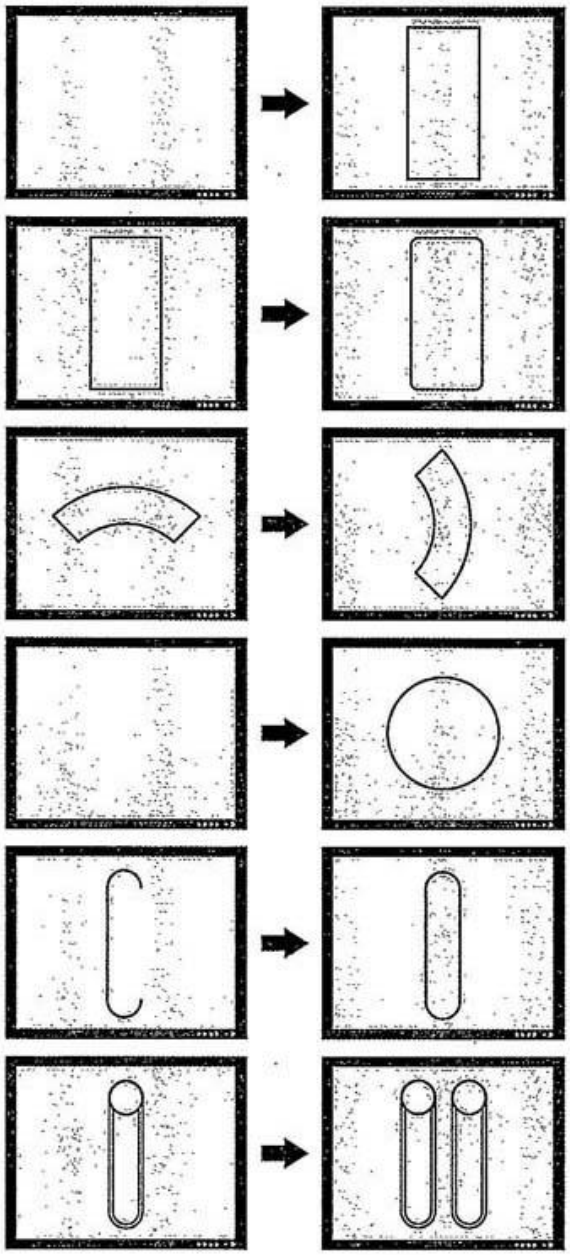
(d) Describe two benefits of a 3D CAD model over a 2D CAD drawing. 2

- Allows a customer to see the complete remote in 360° view.
- A 3D Model could be animated if it had functions. (ie. buttons or sliders)

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
2D Rectangle

(ii) Tool used
Fillet

(iii) Tool used
Rotate 90°

(iv) Tool used
2D Circle

(v) Tool used
2D Line

(vi) Tool used
Copy or 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

Outline

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

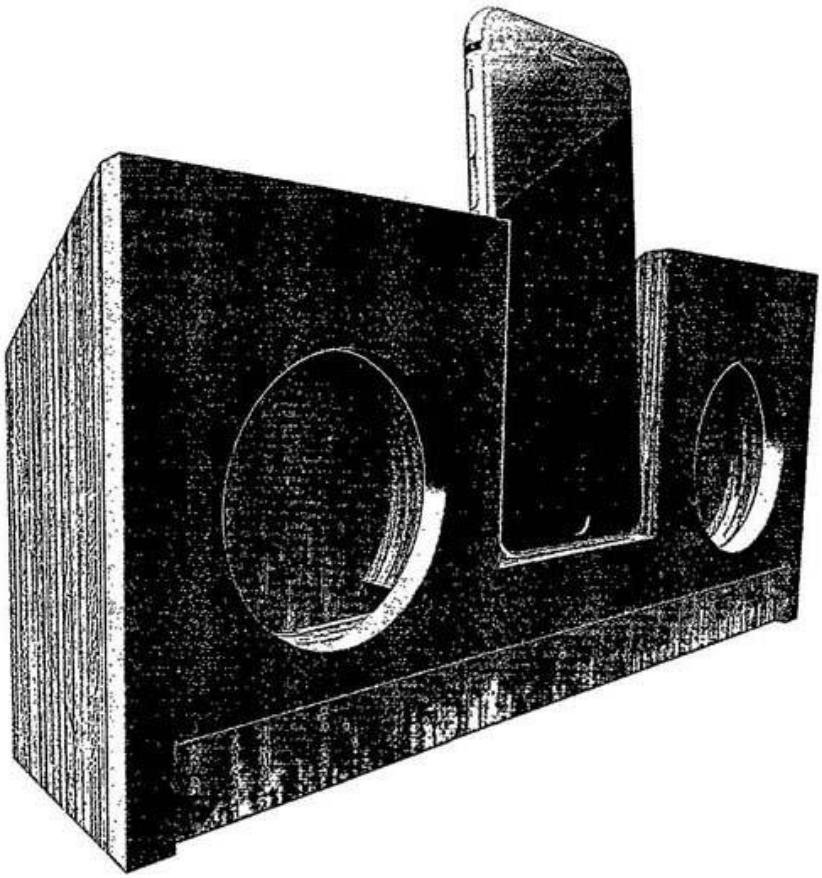
Section Line

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

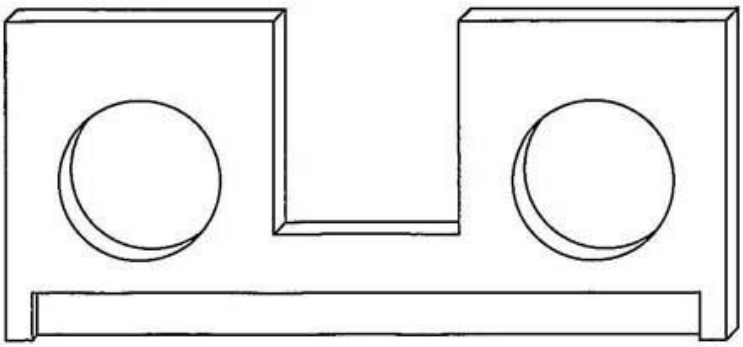
(g) Explain what is meant by the term scale 2:1. 1

For every 2mm drawn it represents 1mm 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.

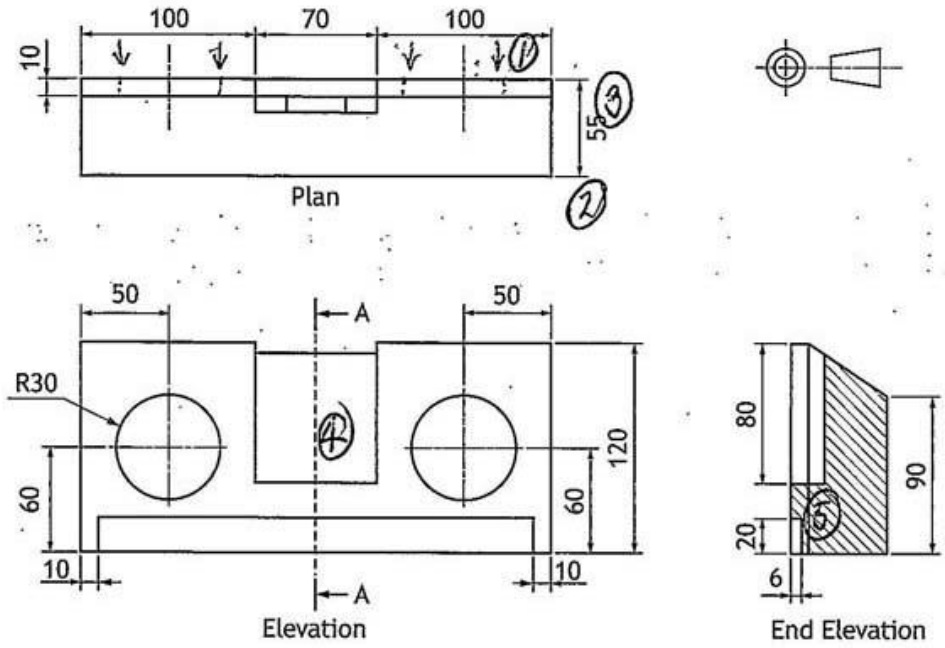


(a) State the type of pictorial view shown above. 1

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 Shold have hidden detail lines for the circles.

② The plan is the wrong way around it should be rotated 180°

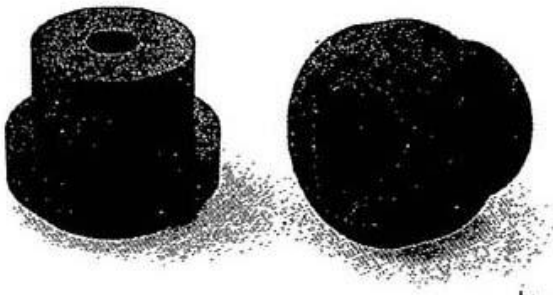
③ '55' should be the other side of the the.

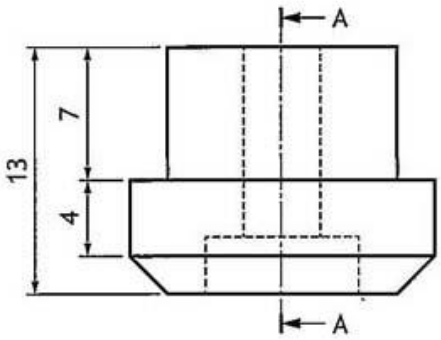
④ Section line should be Dot, Dash, Dot with 2 thick end lines →

⑤ One section of that hatching should be different to the other and not the same, if it is the same part the outline between them should be removed.

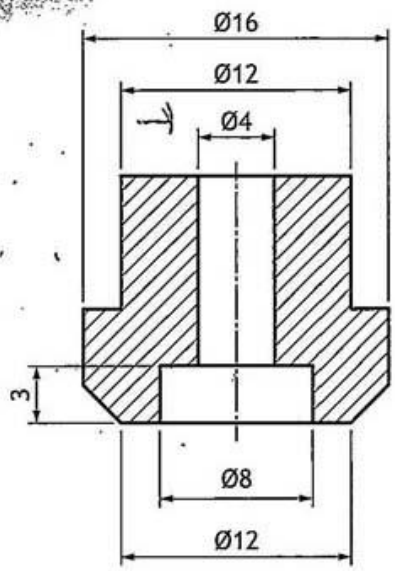
4. **(continued)**

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





Elevation

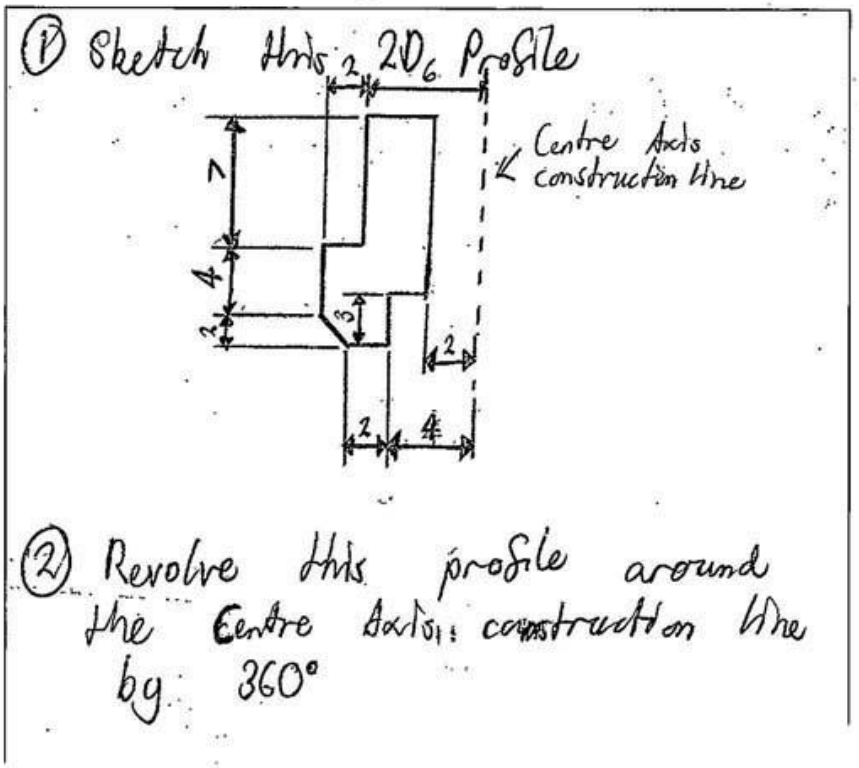


Sectional End Elevation A-A

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.



4. (continued)

The orthographic drawings of the speaker were shared online.

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

- To allow technical people to see what the object looks like and its dimensions.
- To allow some people to make their own speaker

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

- So everyone understands the common symbols used so there is no confusion, cluttered
- Also there is less text to explain everything as they use symbols.

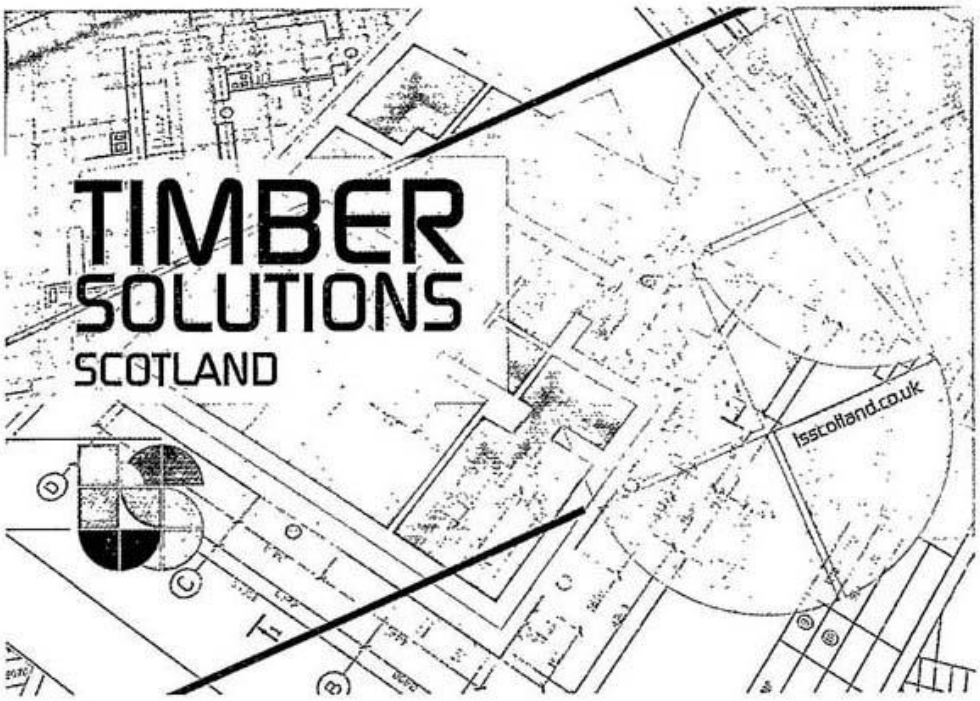
(f) Explain the purpose of the following types of production drawings.

(i) Sectional views To see inside the object at other details working on the inside. 1

(ii) Assembly drawings To see all the different parts together to see how they sit with one another. 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

• Lines have been used on the background at the same angle as the logo to draw your eye to it.
• The line is also used to create structure with the website texts allignment

(ii) Dominance 2

• The company name is dominant as the colours make it stand out from the background.
• The background logo is also dominant because of its size compared to everything.

(iii) Colour 2

• Accent colour of brown is used on the company name and website, the brown is brought out against the receding blue.
• The white background is used to make the front stand out more.

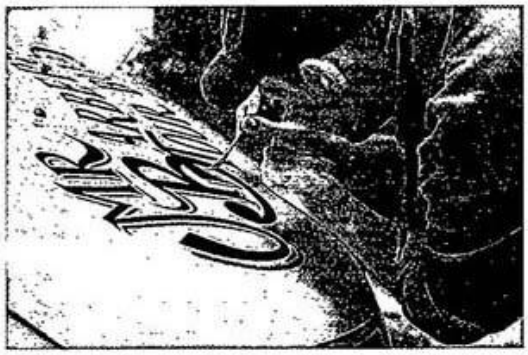
The blue also conveys sophistication and brown conveys nature.

(iv) Unity 2

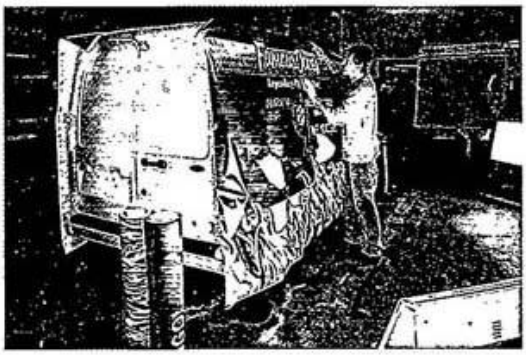
"Accent colour of blue unites the logo and background logo.
"The company name is also in close proximity to the logo uniting them together

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

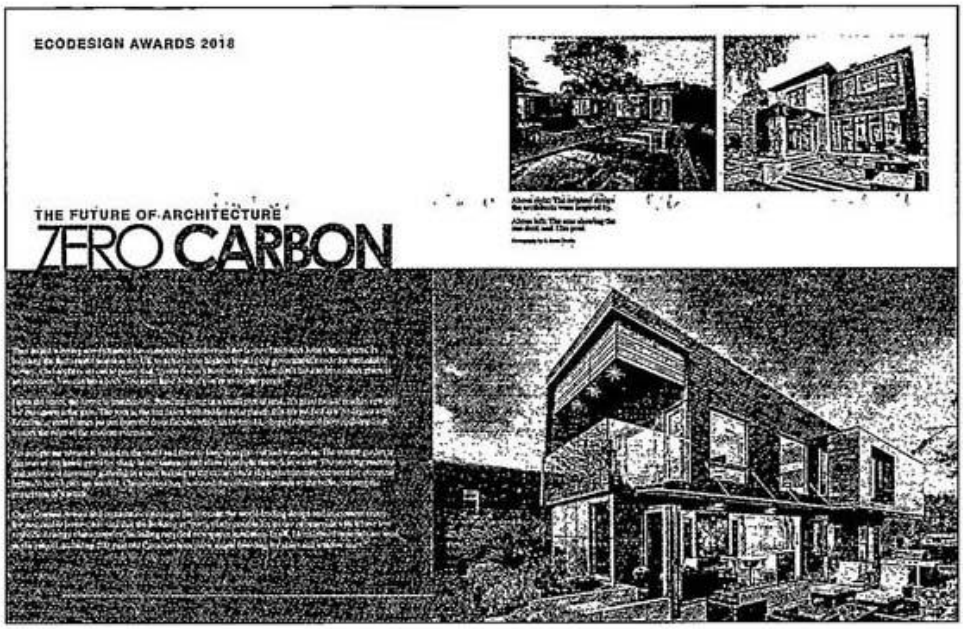


Modern printed technique

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

- Modern techniques are faster to put on and more accurate Labels.
- If there is a mistake made a print can easily be taken off and tried again, a traditional paint would have to be painted over and started again.

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 by making 'house' white.

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

Justify the text and create two columns to make it easier to read.

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

Use a full crop on the house so the sky is removed.

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

Left allign the body text with the 'Zero Carbon' title.

6. **(continued)**

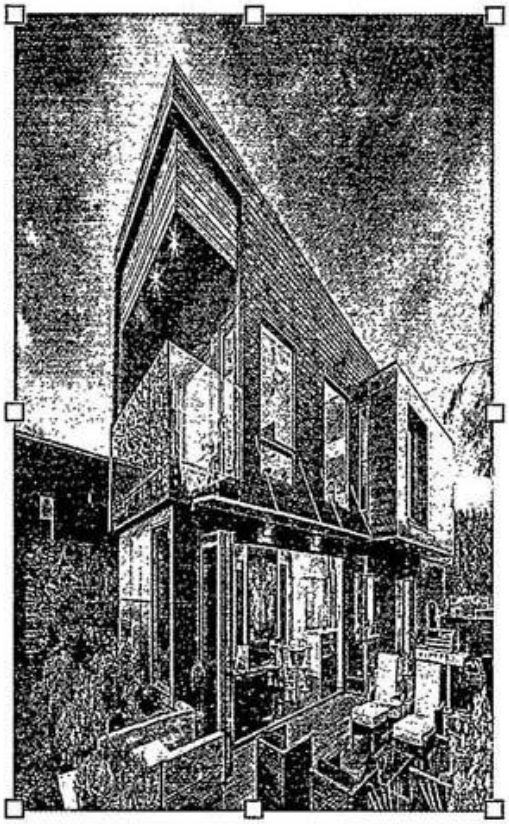
The graphic designer used a sans serif font for the heading.

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

• Sans-Serif has connotations of modernism which is associated with the house.

• Sans-Serif can also appeal to a younger more forward looking market.

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

Using the corner squares and dragging diagonally to change the size but not proportions

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

- It allows things to be accurately aligned.
- This creates structure and unity within the graphic.