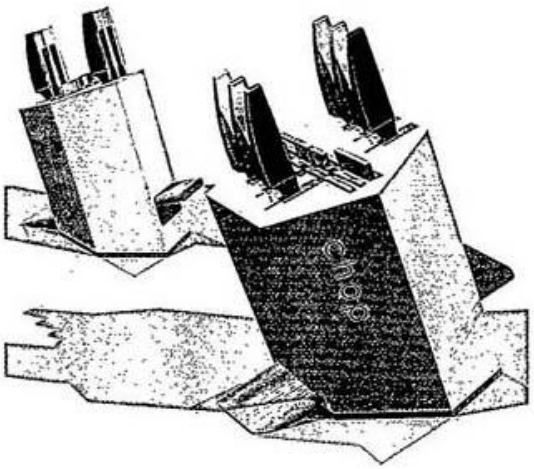
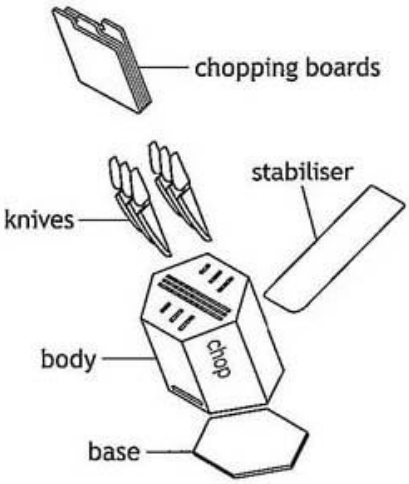
Candidate 7 evidence

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

- Easy to edit if need be
- Saves on material

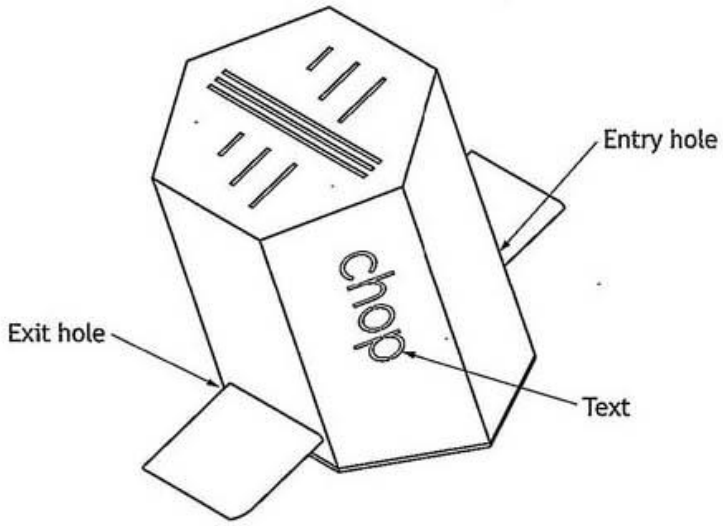
To produce the CAD model the CAD technician was given information about the storage system. One dimension stated: A/F 300mm.

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

After Fixation

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.

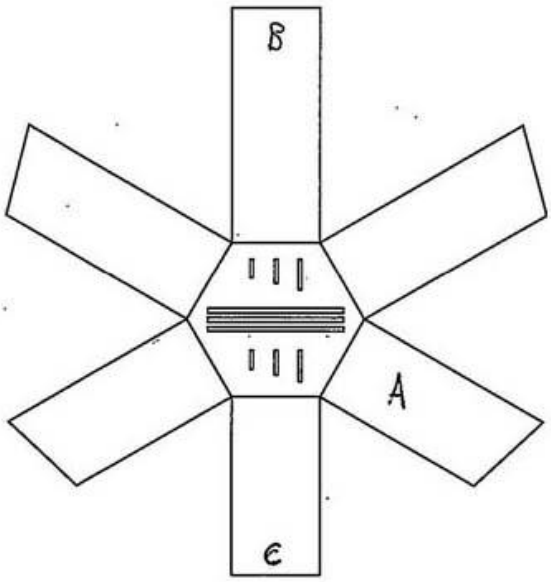


(c) Indicate, on the graphic below, where the Text, Entry hole and Exit hole would be located. 3

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.

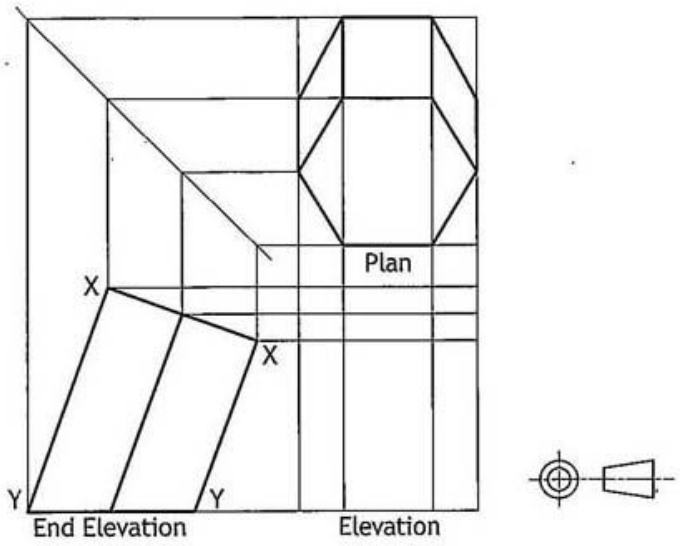
Use **C** to indicate on the panel where the Exit hole would be located.



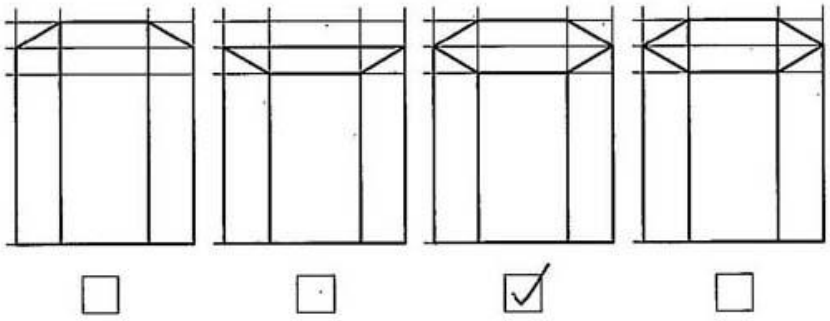
1. **(continued)**

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.

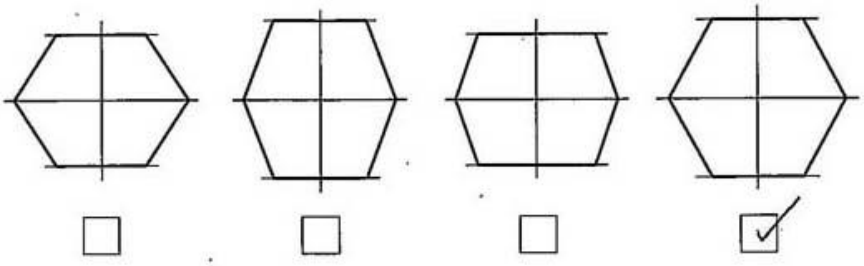


(d) Identify, using a tick (✓), the correct elevation. Ignore wall thickness. 1



A true shape of surface X–X was required.

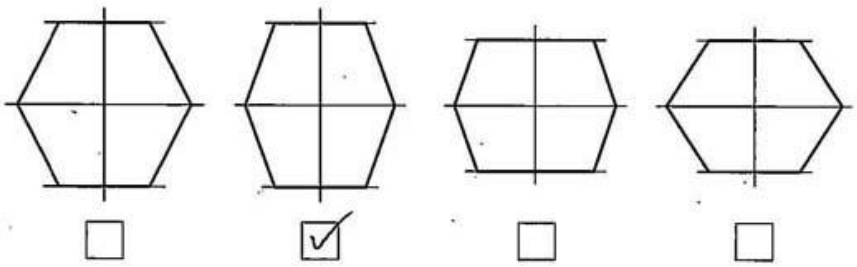
(e) Identify, using a tick (✓), the correct true shape. Use a ruler or trammel to measure. 1



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'.

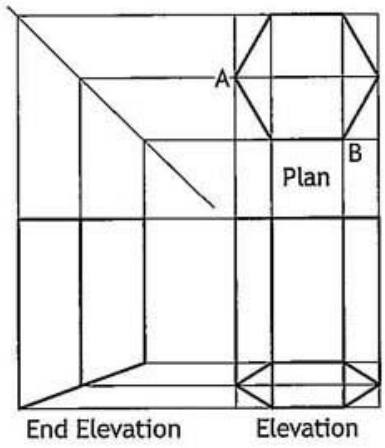
You should refer to the orthographic drawing below.

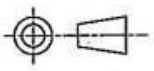
(i) When opened out at generator A, the correct surface development is view. 1

6 *Insert number*

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

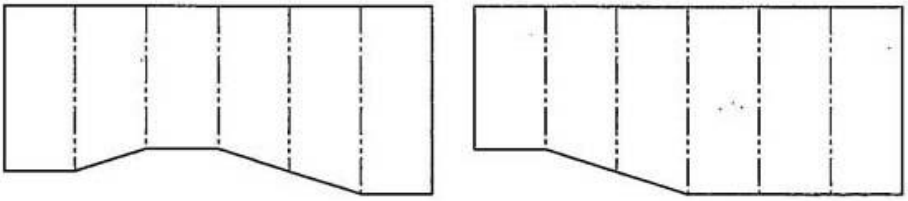
4 *Insert number*





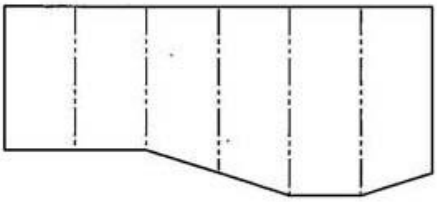
1. **(continued)**

The range of surface developments are show below.

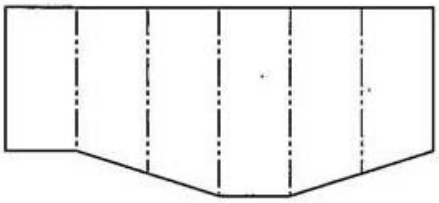


1.

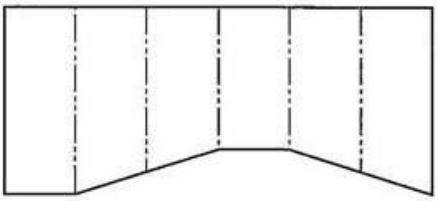
2.



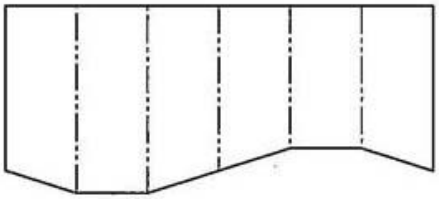
3.



4.



5.



6.

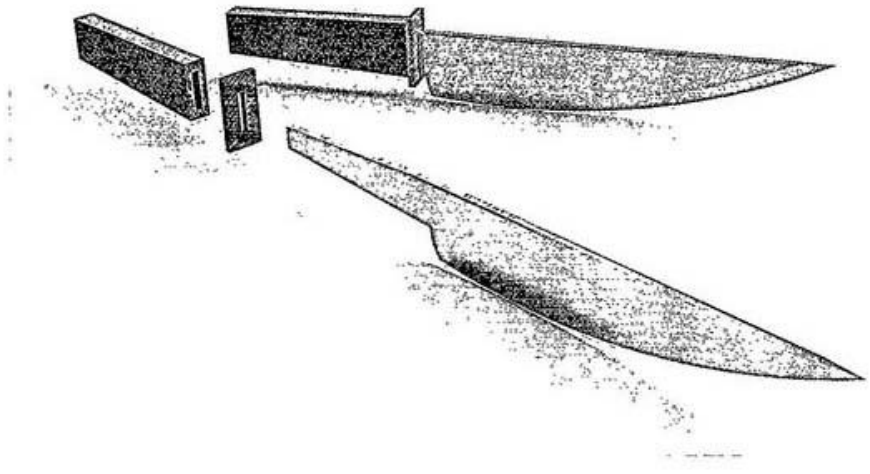
A number of the knife blocks are to be produced from a single sheet of material.

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

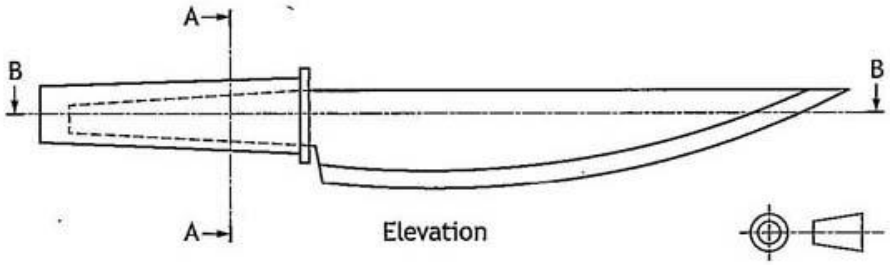
To save on material wasted

1. (continued)

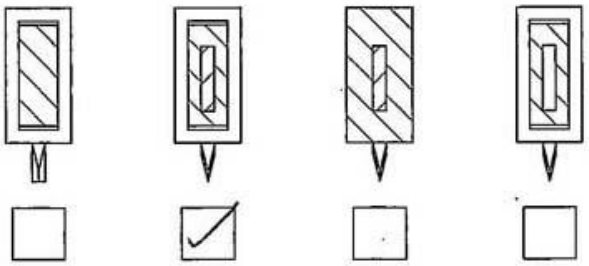
(i) A knife set to complement the knife block is to be produced. Rendered pictorials and orthographic views of one knife are shown below.



Plan

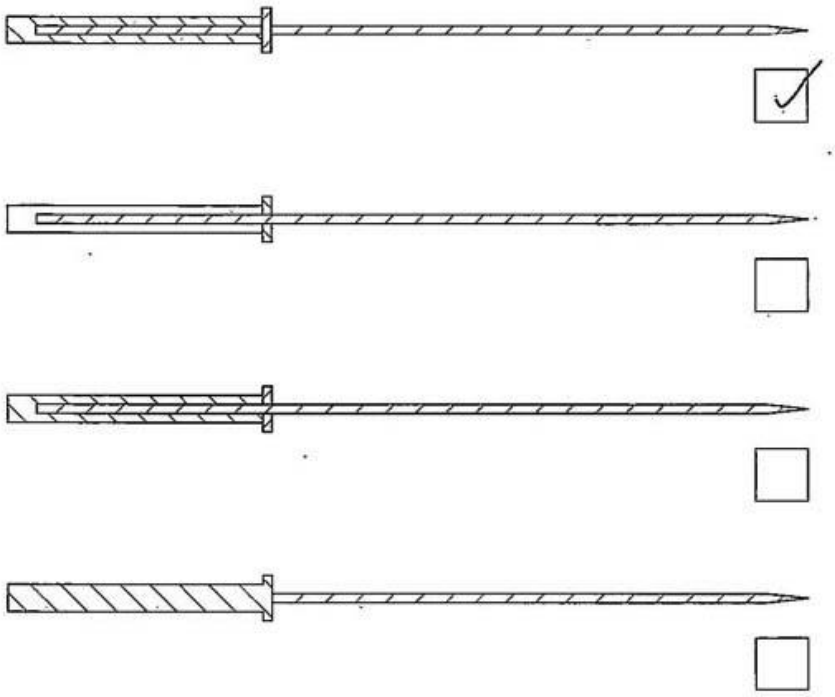


(i) Identify the correct sectional end elevation A-A by ticking (✓) a box below. 1

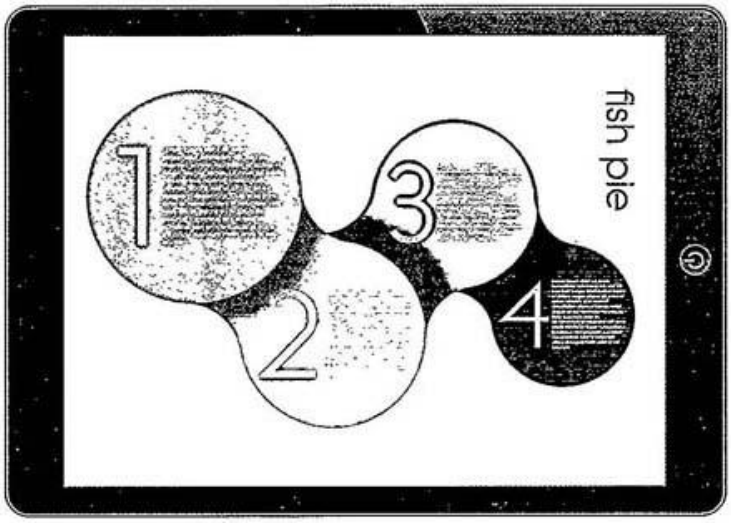


1. (i) (continued)

(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

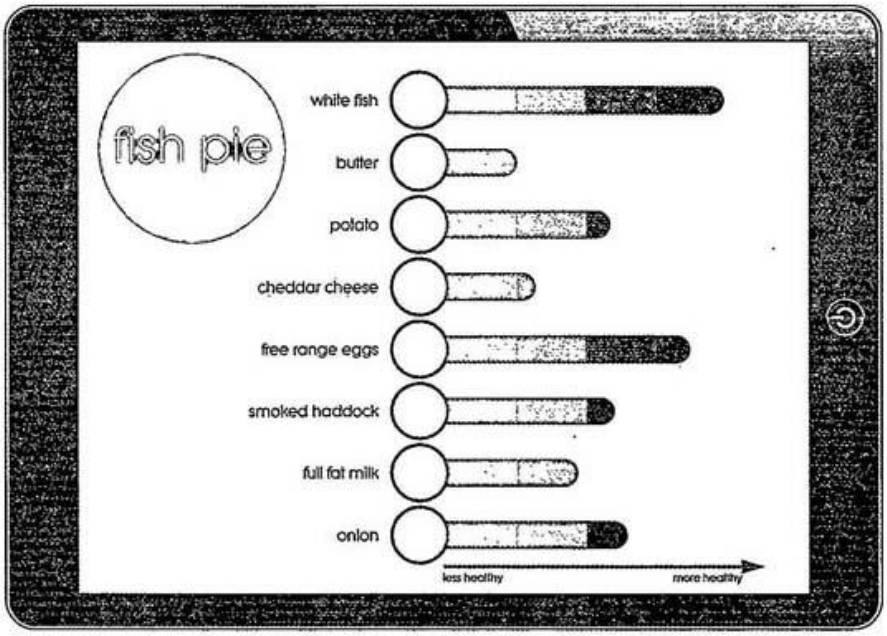
- Flow of the shapes - lead on from each other
- Colour contrasts against each - draws attention to the eye.
- Shadow of the shapes on top of each other

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

- Save of materials and is easily profitable
- Reaches a larger audience - more available.

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

Shade of colour - lighter is the less healthier it is.

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

Easier to display more information.

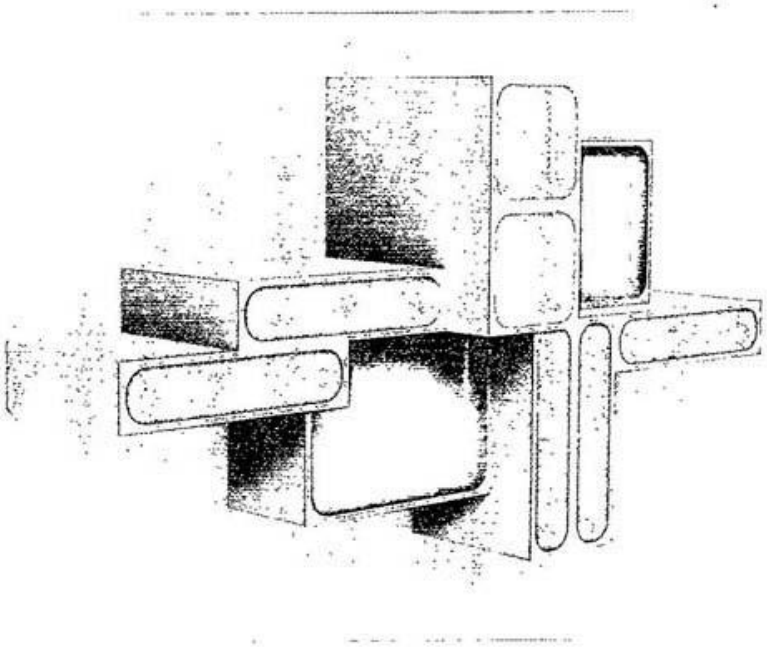
(f) (i) State the most suitable type of informational graphic to present the data in **Statistics B.** 1

Pie chart

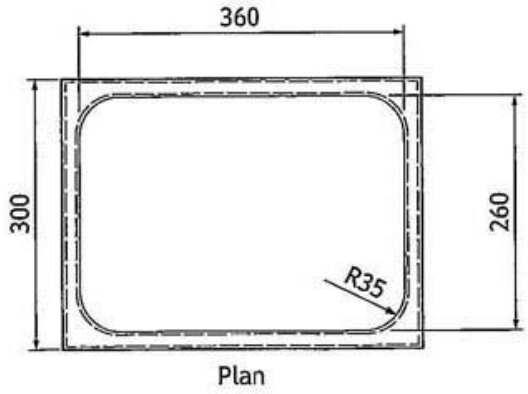
(ii) Explain why this is an appropriate type of informational graphic to present. 1

Information is out of 100%. Gives a clear view on the data.

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.

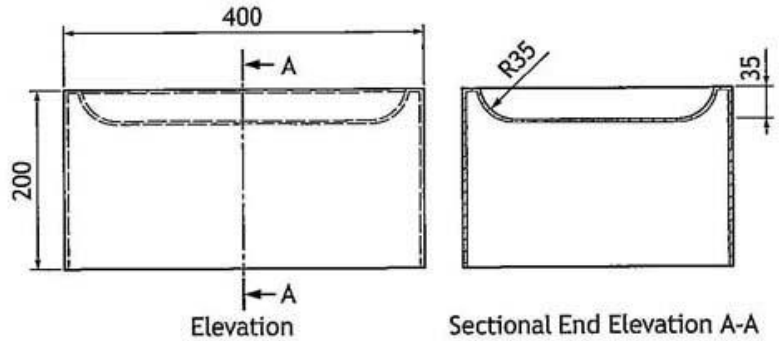


An orthographic drawing of one of the orange lighting pods is shown below.



Plan

Please note:
Wall thickness = 3 mm



Elevation

Sectional End Elevation A-A

3. (continued)

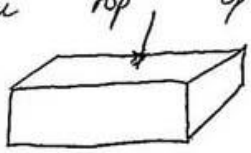
(a) Describe, using the correct dimensions and 3D CAD modelling terms, how you would use 3D CAD software to model the orange lighting pod. You may use sketches to support your answer. 6

First

~~Create~~ Sketch a rectangle of ~~300 x 400mm~~ 300 x 400 mm

Then extrude the rectangle by 200 mm

Then create a sketch ~~of a rectangle~~ on the top of the ~~orange~~ object



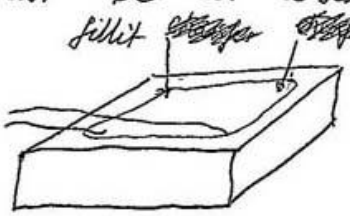
Sketch a rectangle 360 x 260mm and are the edges.

Extrude cut the sketch to 35 mm deep.

Then use ~~fillit~~ fillit to round the inside edges of the extrusion.

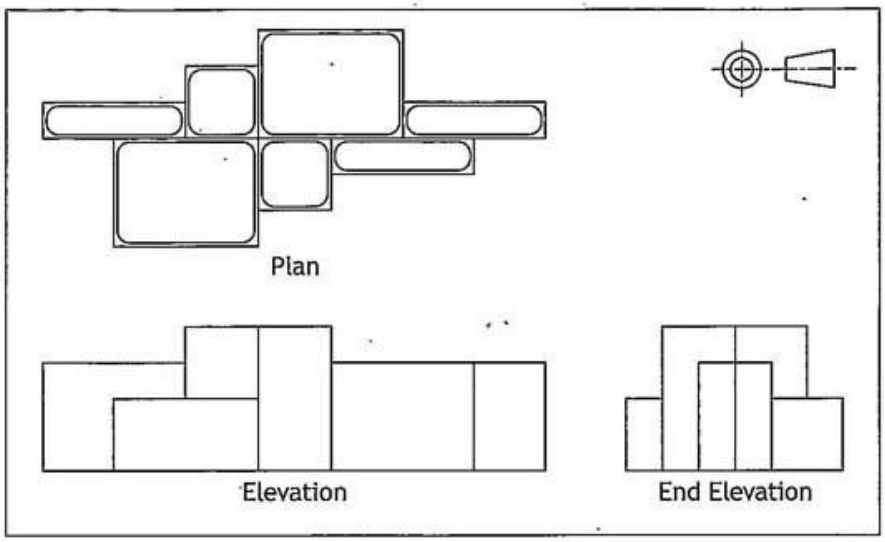
The ~~fillit~~ fillit must be at a radius of 35mm

~~fillit~~ fillit



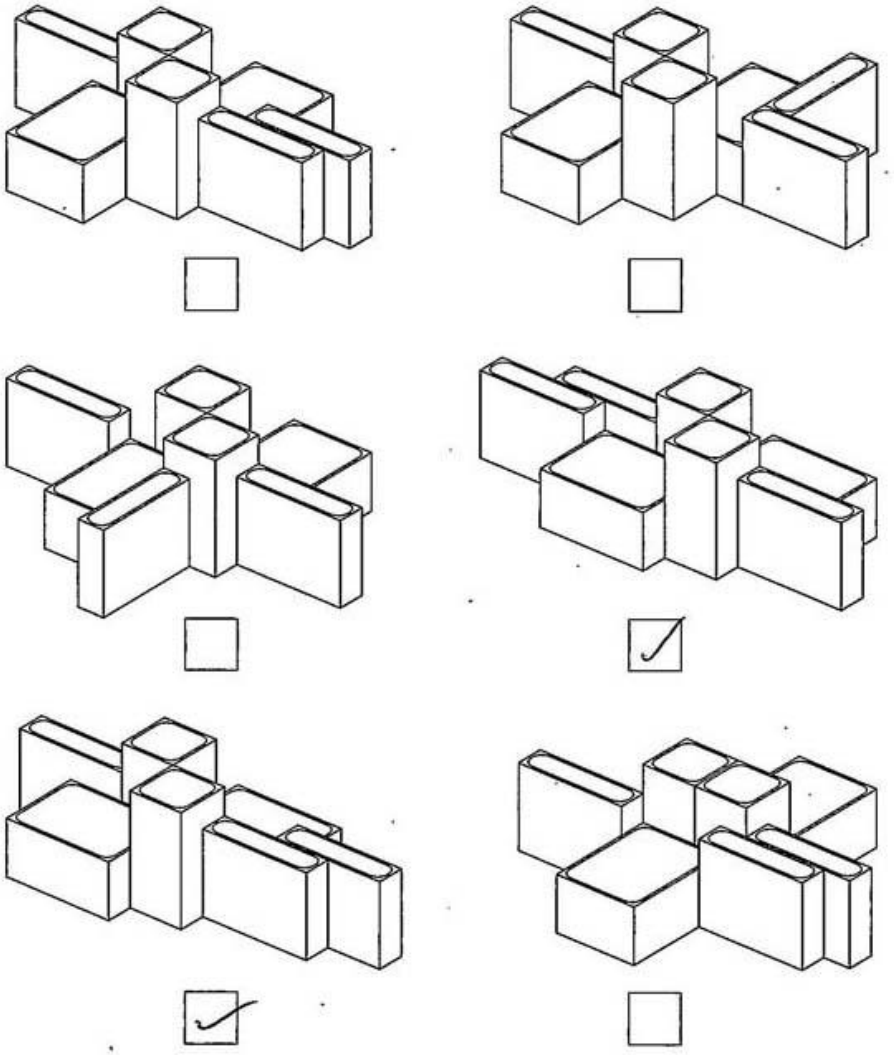
3. (continued)

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



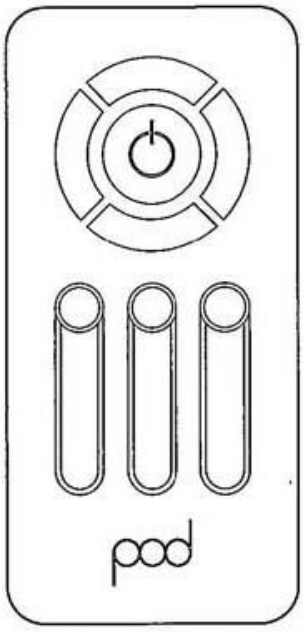
3. (continued)

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

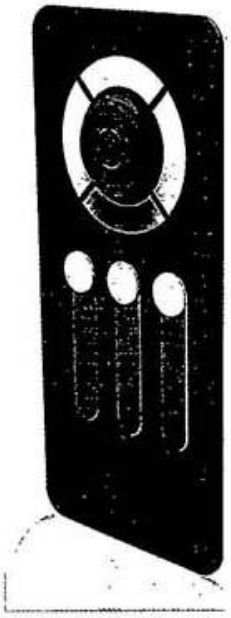


3. **(continued)**

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

because the 3D CAD model needs to be rendered

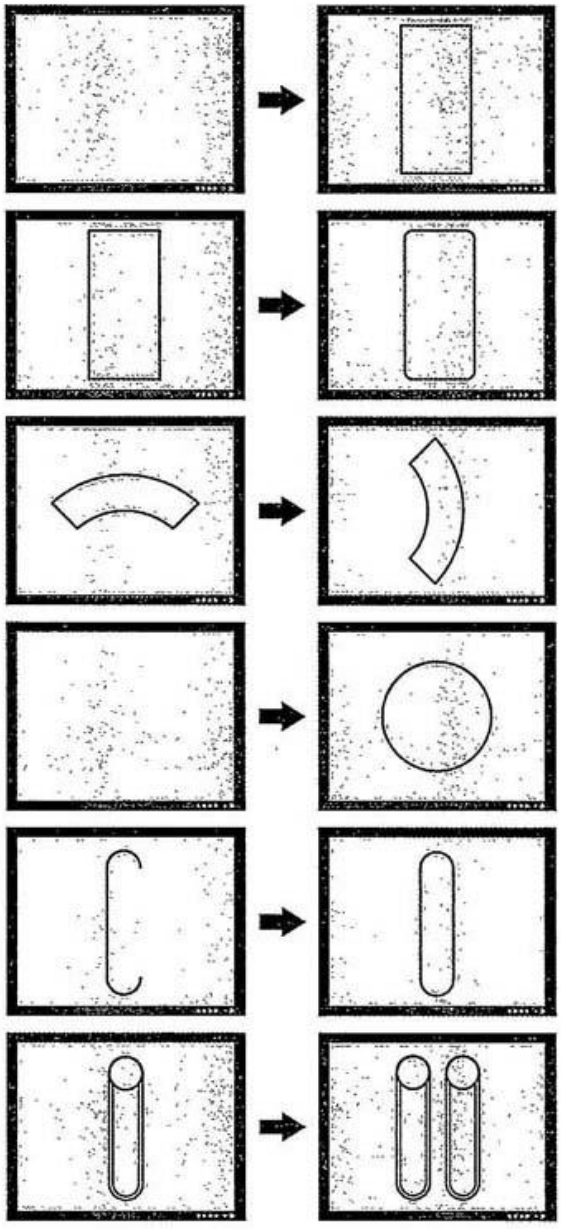
(d) Describe two benefits of a 3D CAD model over a 2D CAD drawing. 2

- Can see a life like model and a preview of what it will look like
- Easier to view anything that requires editing.

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 fillit

(iii) Tool used rotate

(iv) Tool used circle

(v) Tool used ~~edit~~ line

(vi) Tool used copy

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

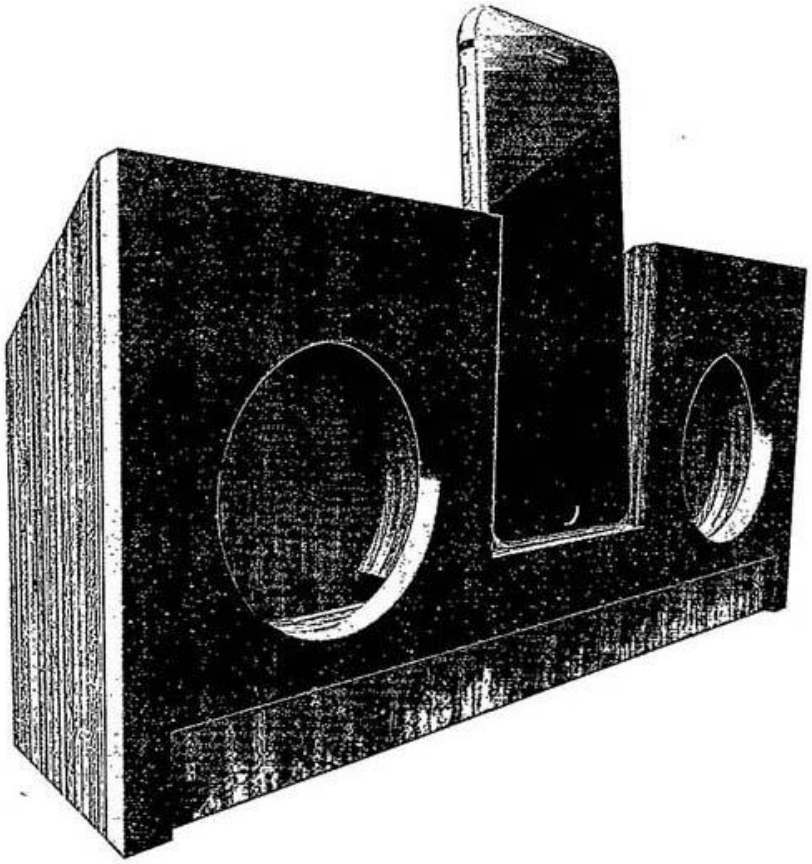
sectional line

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

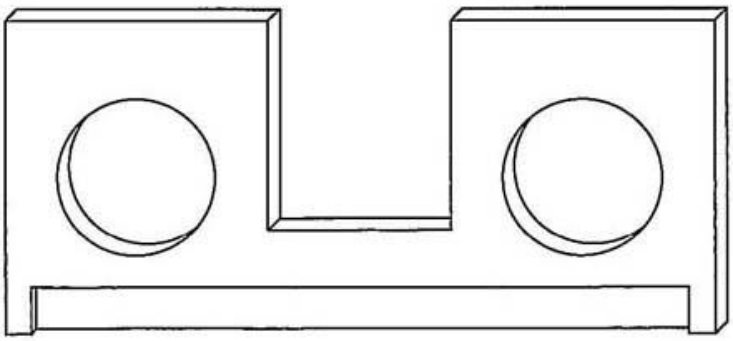
(g) Explain what is meant by the term scale 2:1. 1

2 x larger

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.

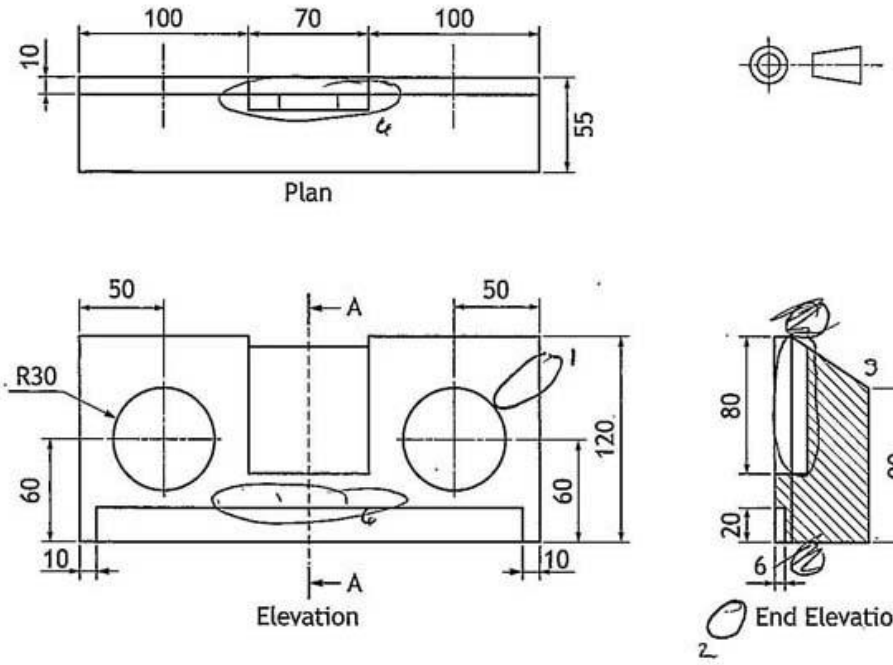


(a) State the type of pictorial view shown above. 1

Isometric

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.

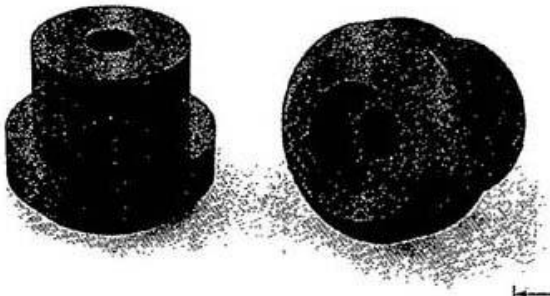
(b) State the five errors found in this drawing. **5**

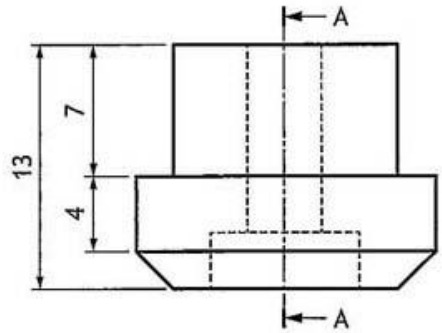
You may annotate the orthographic drawing to support your answer.

1- radius of circle missing
2. hasn't mention what sectional view it is
3. sectional lines are wrong
4. Detail missing
5. ~~Hidden~~ ~~detail~~ missing detail

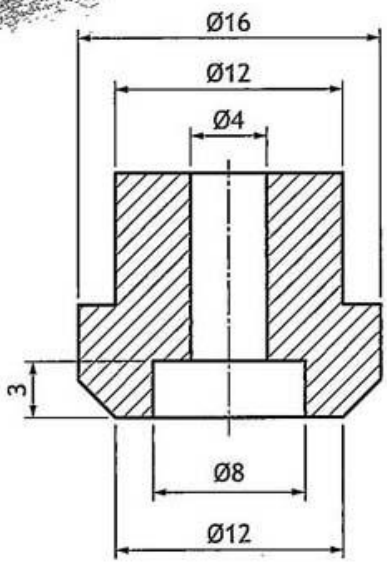
4. **(continued)**

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





Elevation



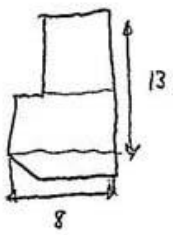
Sectional End Elevation A-A

4. **(continued)**

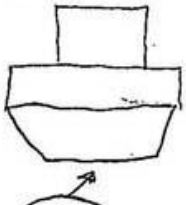
(c) Describe, using the correct dimensions and 3D CAD modelling terms, how the rubber foot, shown opposite, would be produced. **3**

You may use sketches to support your answer.

First create a sketch of half of the object 13 x 8 mm



Then revolve the shape to create a full 360° object.



Then create a sketch on top of the shape. Sketch a circle with a diameter of 8mm in the centre of the circle on the top of the object. Extrude cut this shape by 3mm

Then create another sketch of a circle with a diameter of 4mm in the centre of the previous circle. Extrude cut this circle by 10mm to complete the object.

4. (continued)

The orthographic drawings of the speaker were shared online.

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

- allows someone else to create it easily
- everything should turn out consistant
- Measurments are all the same and previous measured to save time.

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

- so everything is to the same scale
- Nothing is confusing about it and easy to read and interpenet.

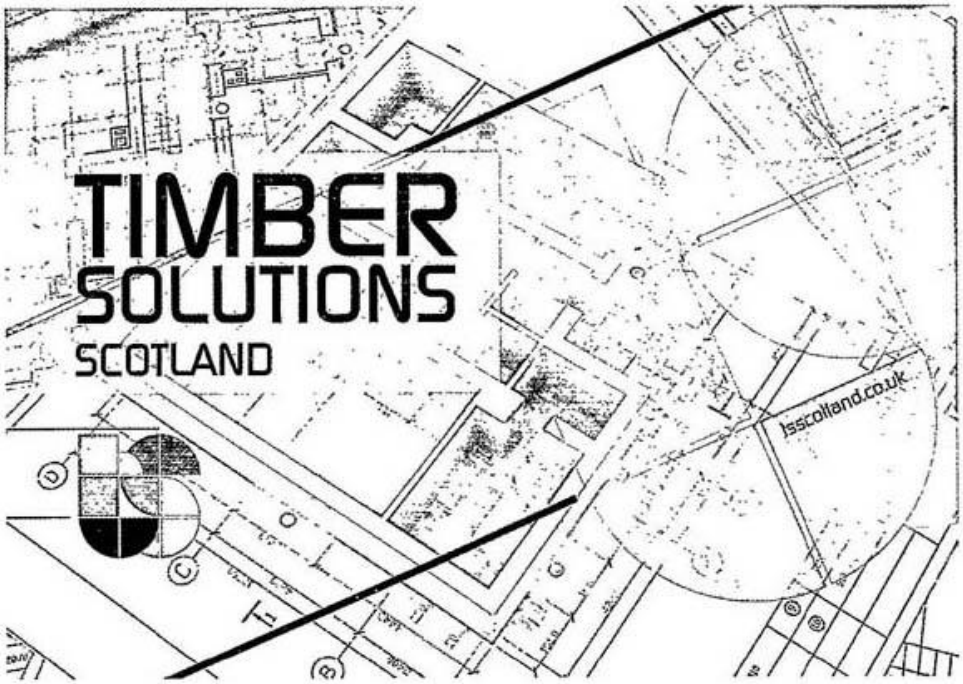
(f) Explain the purpose of the following types of production drawings.

(i) Sectional views To see what it should look like inside of the object. 1

(ii) Assembly drawings To allow anyone to see where everything 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

- The blue line goes behind the company's name to make it stand out.
- Lines break up the logo and add depth to the logo

(ii) Dominance 2

- The ~~logo~~ title is ~~dominant~~ large in the ad to show importance
- The colour of the logo contrasts ~~it~~ against the background to make it stand out.

(iii) Colour 2

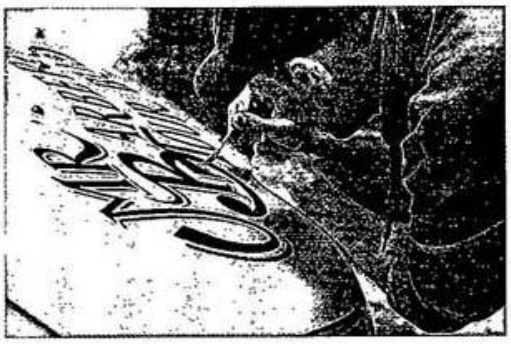
- The blue of the logo contrasts with the white background.
- The brown colour of the name and the website draws attention to it.

(iv) Unity 2

- The alignment of the logo
- Unity ~~in~~ in the different shades of blue.

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.



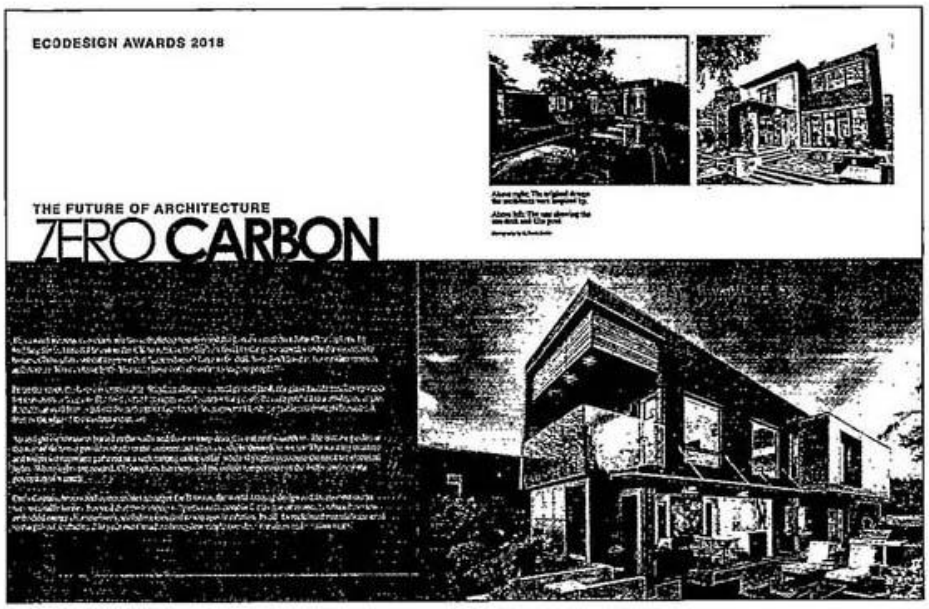
Traditional painting technique

Modern printed technique

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

- less time consuming and means the printing can be done quicker an still look just as good.
- Easy to replace or change in the case if gets damaged or if you wanted to edit it.

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 word could be changed to white.

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

increase the size of text or decrease the amount.

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

Photoshop out the sky.

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

Move the text away from the edge.

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**

- Clear to see and easy to read.
- Stands out

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**

held the control key down while dragging to size.

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

- See if everything fits to proportion
- to give them an idea of where things can be placed on the page.