

FOR OFFICIAL USE

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National
Qualifications
SPECIMEN ONLY

Mark

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SQ22/H/01

**Graphic
Communication**

Date — Not applicable

Duration — 2 hours



Fill in these boxes and read what is printed below.

Full name of centre

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Town

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Forename(s)

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Surname

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Number of seat

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Date of birth

Day

Month

Year

D	D
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M	M
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Y	Y
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Scottish candidate number

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Total marks — 70

Attempt ALL questions.

Write your answers clearly in the spaces provided in this booklet. Additional space for answers is provided at the end of this booklet. If you use this space you must clearly identify the question number you are attempting.

All dimensions are in mm.

All technical sketches and drawings use third angle projection.

You may use rulers, compasses or trammels for measuring.

In all questions you may use sketches and annotations to support your answer if you wish.

Use **blue** or **black** ink.

Before leaving the examination room you must give this booklet to the Invigilator; if you do not, you may lose all the marks for this paper.



Attempt ALL questions

Total marks — 70

MARKS

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1. A public building that was constructed in the 1950s is to be modernised. The original drawings were produced manually in paper format. The architect has requested that the manual drawings be converted to a digital format and sent electronically.

The conversion methods being considered are: scanning the original drawings or reproducing the drawings using CAD software.

- (a) (i) Compare the two methods in terms of their suitability for this task.

4



* S Q 2 2 H 0 1 0 2 *

1. (a) (continued)

- (ii) Explain two possible disadvantages that may be encountered when two different people or companies work together on the same project using CAD.

2

CAD simulation could be used to test aspects of the design of the building.

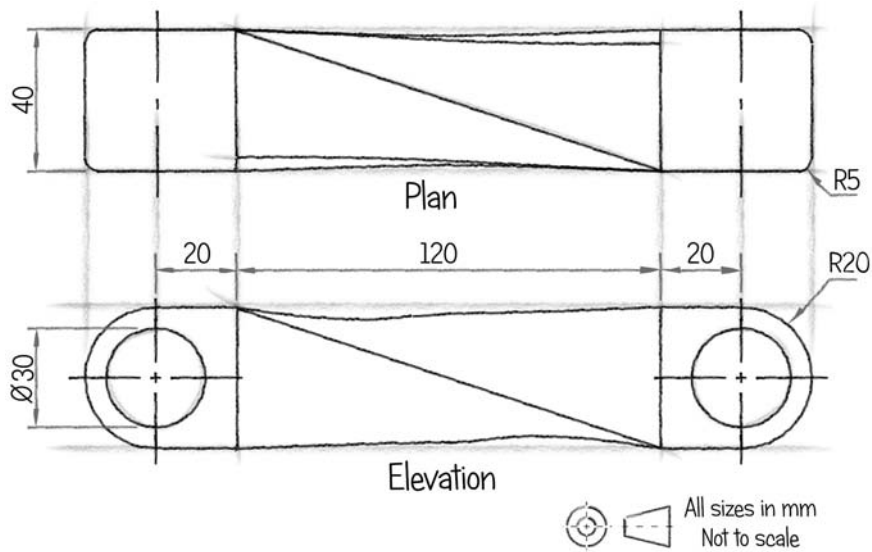
- (b) Identify an aspect of the design that could be tested through a CAD simulation.

1

- (c) Identify an advantage of a "paperless office" to an architectural business.

1

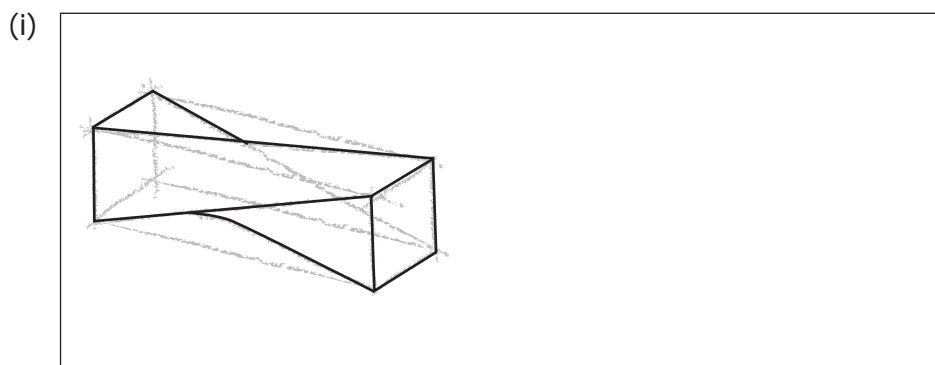
2. The sketches below were used by a CAD technician to create a 3D model of a portable speaker casing. The 3D model will be used to make production drawings and a promotional illustration.



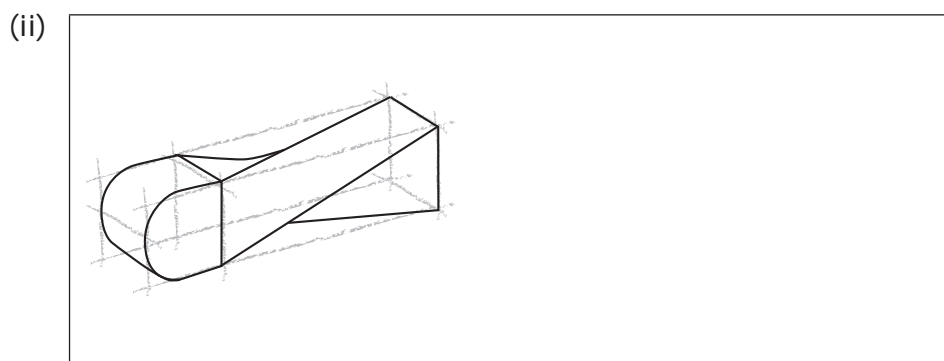
Orthographic sketch

The CAD technician sketched a modelling plan before creating the 3D model. The first two stages of the modelling plan are shown below.

- (a) Describe the 3D modelling techniques proposed for each stage, making reference to all relevant dimensions from the orthographic sketch. You can sketch, annotate the sketches provided and/or use text in your answer.



2

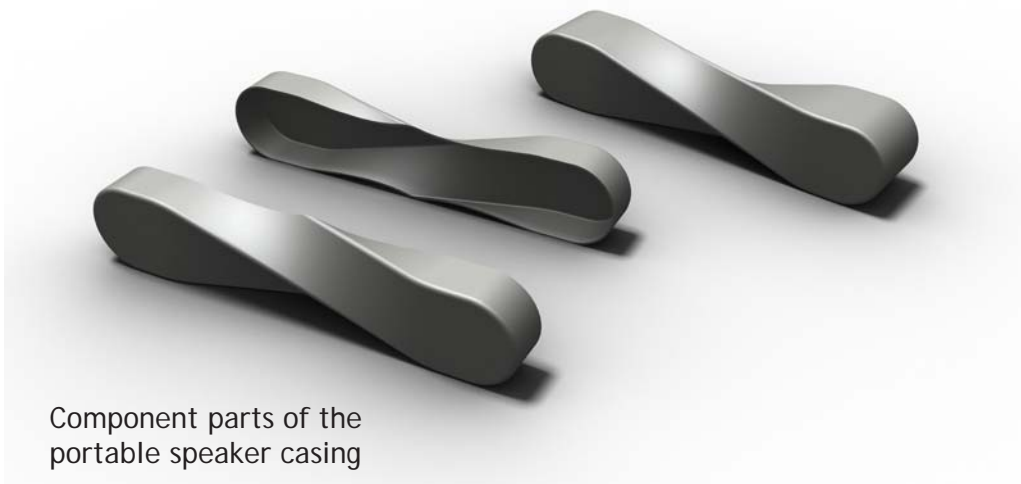


2



2. (continued)

Solid model of the portable speaker casing



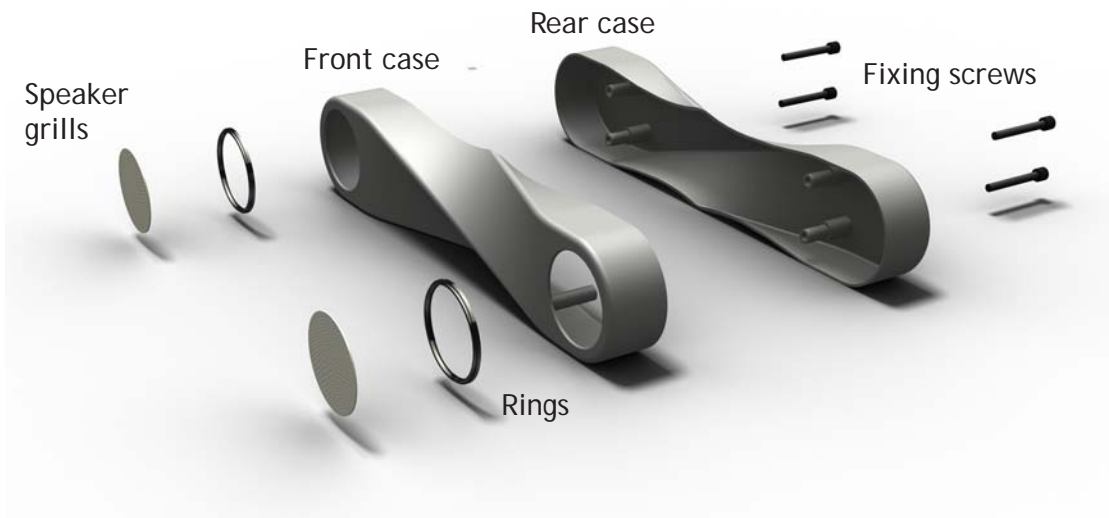
Component parts of the portable speaker casing

A solid model of the portable speaker casing and the two components generated from it are shown above.

- (b) Describe, using a "top-down" approach, the techniques used to create the two component parts from the solid model. You can sketch, annotate and/or use text in your answer.

4

2. (continued)



The components of the speaker casing are shown above.
The fixing screws were imported from a CAD library.

(c) Explain why this type of component would be included in a CAD library. 2



2. (continued)

MARKS
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The two component parts of the portable speaker casing need to be assembled within the CAD software.

- (d) Outline the 3D modelling techniques used to fully constrain the two component parts. You may use annotated sketches to support your answer if you wish.

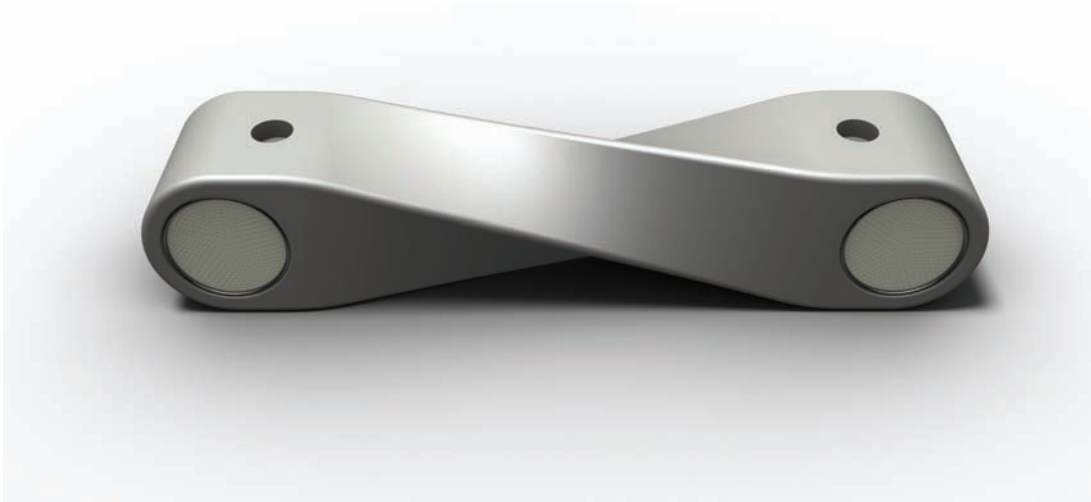
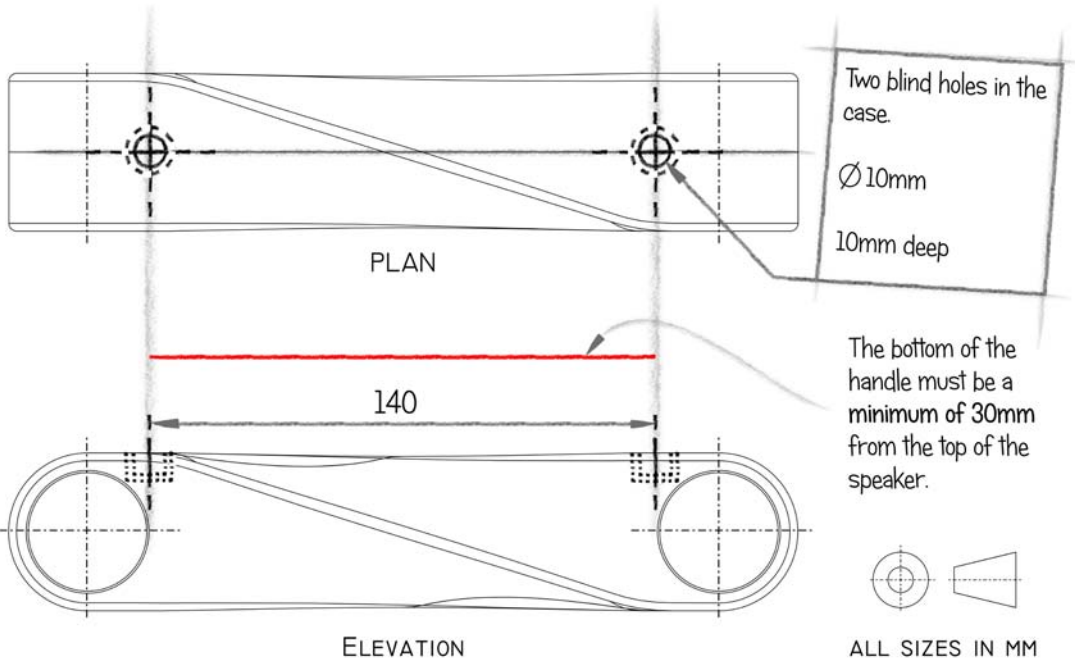
2



* S Q 2 2 H 0 1 0 7 *

2. (continued)

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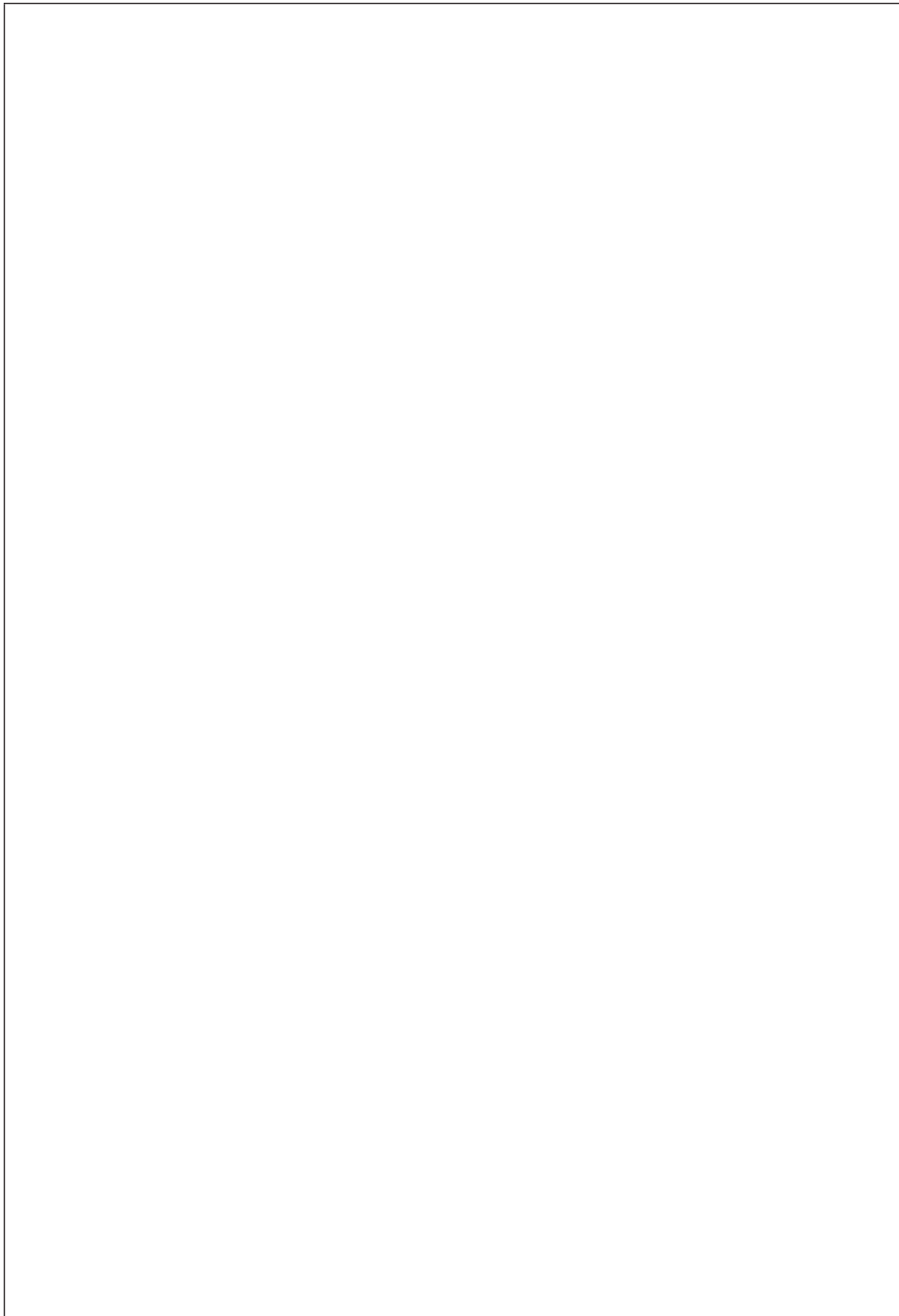


2. (continued)

The portable speaker casing design has been modified to allow a simple handle to be attached. These modifications have been sketched on the production drawings and shown on the 3D model on the left.

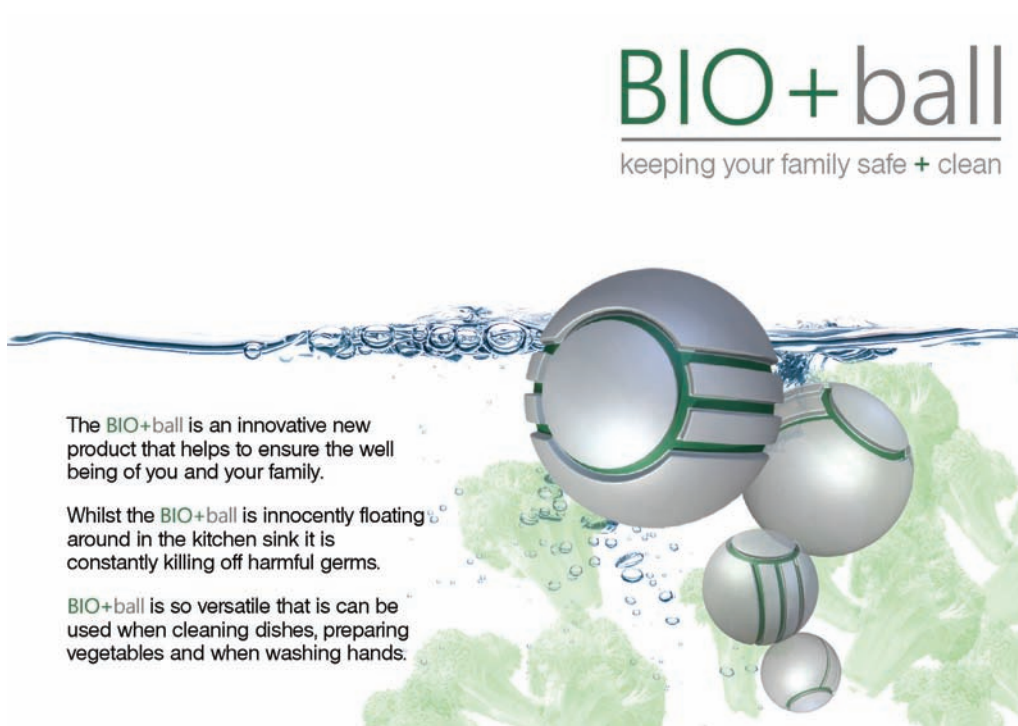
- (e) Produce a modelling plan which could be used to create a 3D CAD model of a simple handle to fit the blind holes in the casing. The handle will be glued into the holes. You can sketch, annotate, and/or use text in your answer.

4



* S Q 2 2 H 0 1 0 9 *

3. The promotional layout below is used to attract consumers to a new product.



BIO+ball
keeping your family safe + clean

The BIO+ball is an innovative new product that helps to ensure the well being of you and your family.

Whilst the BIO+ball is innocently floating around in the kitchen sink it is constantly killing off harmful germs.

BIO+ball is so versatile that it can be used when cleaning dishes, preparing vegetables and when washing hands.

The image shows a promotional layout for 'BIO+ball'. At the top right, the product name 'BIO+ball' is written in a large, green, sans-serif font, with a horizontal line underlining the 'O'. Below it, the tagline 'keeping your family safe + clean' is written in a smaller, black, sans-serif font. The central part of the image features a 3D rendering of several silver, spherical objects with green horizontal bands, floating in water. The background is a soft-focus image of green vegetables, likely broccoli, with water droplets and bubbles scattered around. On the left side of the image, there are three short paragraphs of text in a black, sans-serif font, describing the product's benefits and uses.

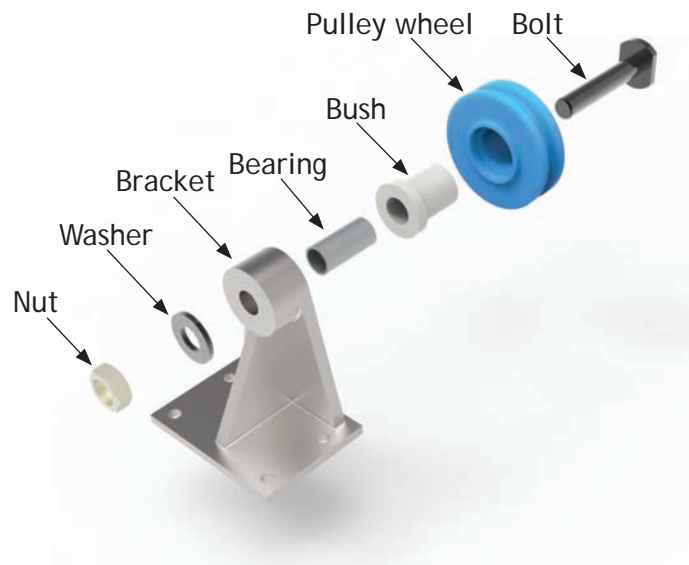
Explain how the graphic designer has used typeface, colour and choice of images to attract consumers.

4



* S Q 2 2 H 0 1 1 0 *

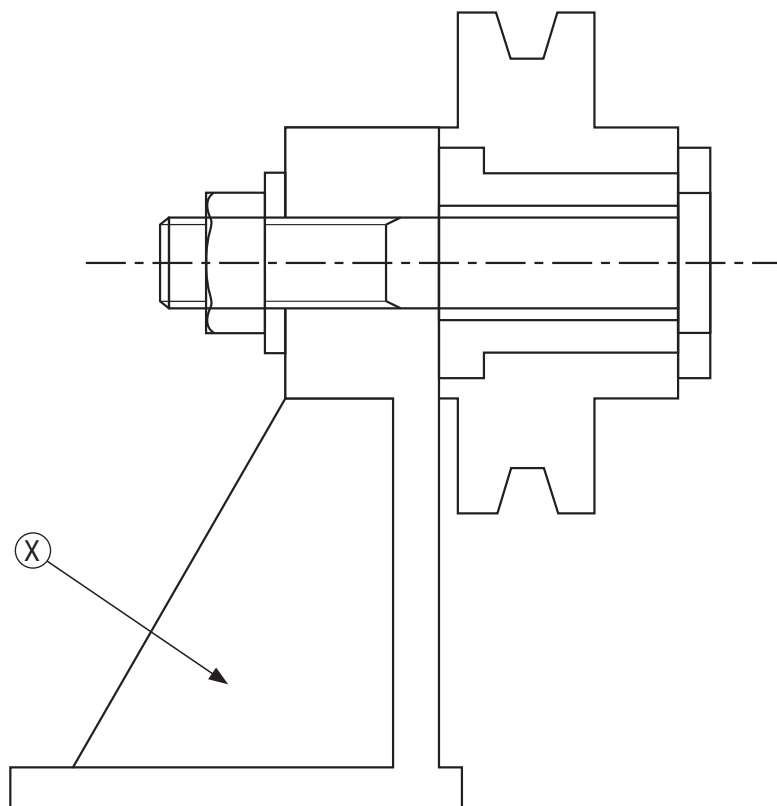
4. Components that make up a pulley wheel assembly are shown below as an exploded view.



An incomplete sectional elevation, cut along a central vertical plane, is shown below.

- (a) (i) Apply hatching to the assembled elevation to show the different components taking account of British Standards. You may sketch the section lines on the view and you can use a straight edge if you wish.

3



- (ii) State the name for the feature shown at X.

1



4. (a) (continued)

The bolt used in the assembly has flat sections on the end for a spanner to fit.

- (iii) Apply the British Standards convention for this flat on the bolt shown below (Figure 1).

1

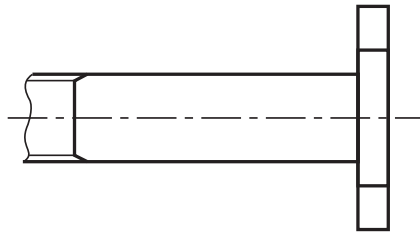


Figure 1

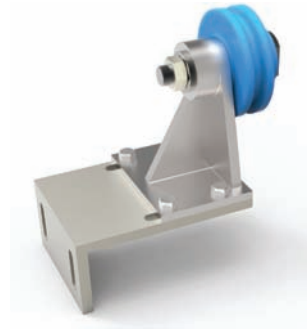


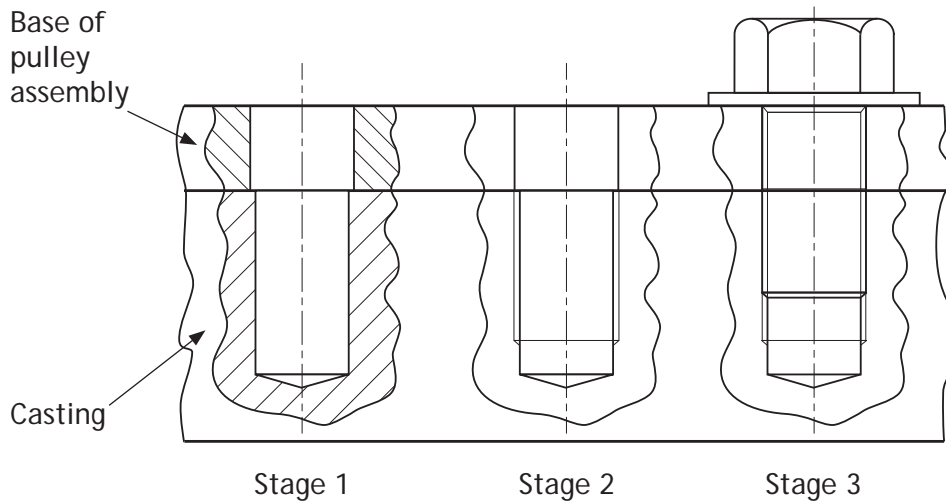
Figure 2

The 3D view in Figure 2 shows the pulley assembly bolted by the base to another component. The drawing below shows the three stages.

Stage 1 — a blind hole is machined in the component

Stage 2 — a thread is cut into the blind hole

Stage 3 — an M10 bolt and washer is fitted to secure the pulley assembly



- (b) (i) Apply hatching to Stage 2 and Stage 3 above taking account of British Standards and conventions. You may sketch the section lines on the view and you can use a straight edge if you wish.

2



4. (b) (continued)

(ii) Explain the term "blind hole" at Stage 1.

1

(iii) What does the "M" stand for on the M10 bolt?

1

(iv) Determine the depth of the hole for the thread cut at Stage 2.

1

(v) State the type of section shown at Stages 1 to 3.

1

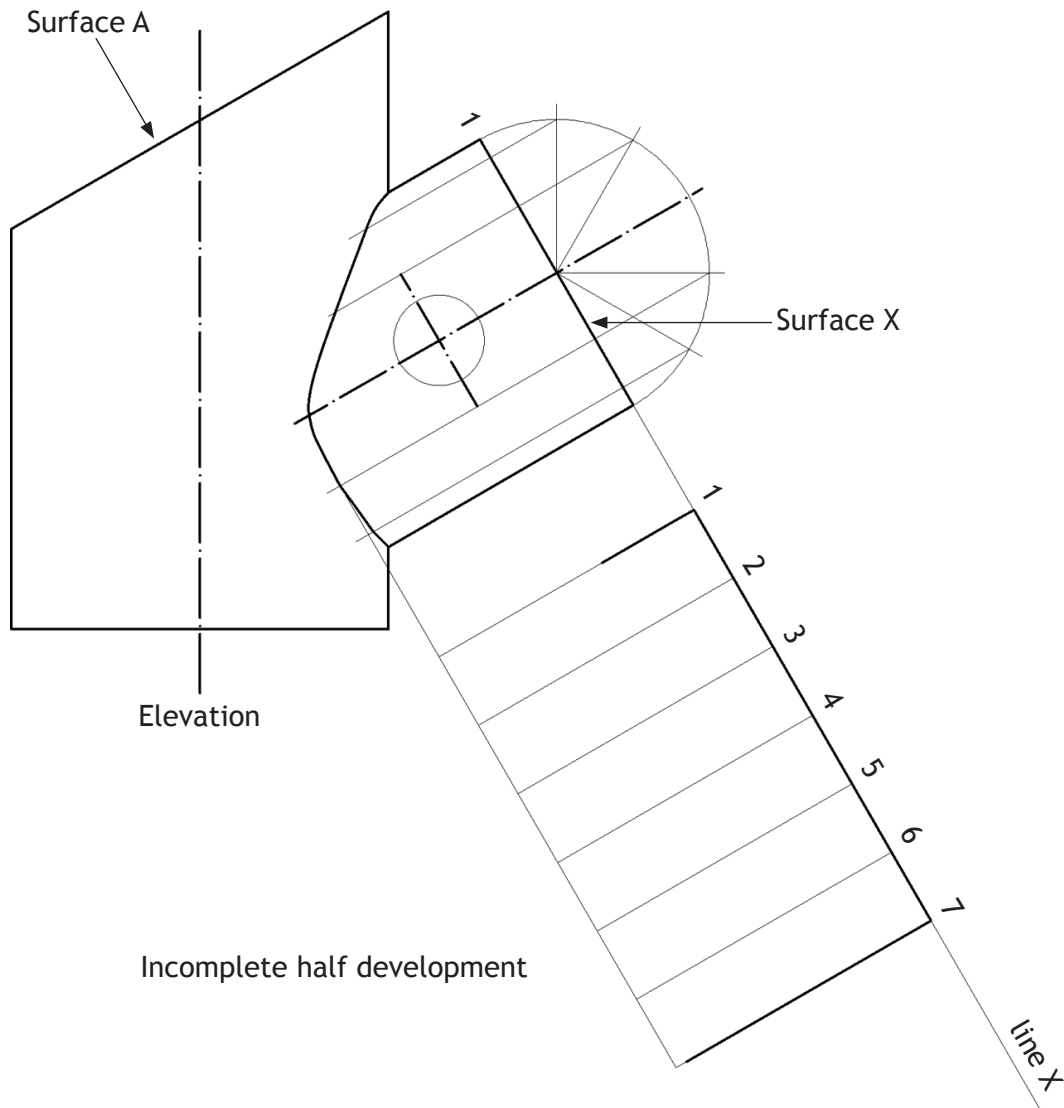
The holes on the base of the pulley assembly are 10.5 mm with a tolerance of -0.15 and $+0.15$ applied.

(vi) Apply the dimensional tolerance to the hole in Stage 1 taking account of British Standards.

1



5. The elevation of two interpenetrating cylindrical pipes is shown below. A surface development of interpenetrating cylindrical pipes is being generated using 2D CAD. The elevation and part construction work is shown below.



Line X has been drawn and will be offset to the left to create a series of parallel lines to locate the intersection for plotting the points.



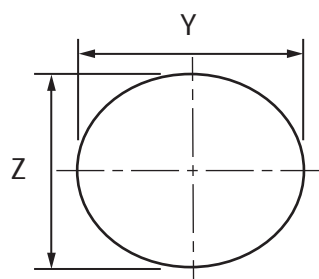
5. (continued)

- (a) Complete the table provided indicating the offset required to locate the position of the points on each generator given (1–7) and the centre point for the circle.

2

Generator line	Offset from line X (mm)
1	
2	
3	
4	
5	
6	
7	
Circle centre point	

The true shape of surface A is shown below.



Not to scale

- (b) What are the full dimensions for Y and Z on surface A?

1

Y = _____ Z = _____



6. Use the three layouts in the **Question 6 supplement** provided to answer this question.

Three promotional layouts for “One Stop Kit Shop”, a cycling accessories chain, are shown.

The layouts are aimed at three different target markets and will be displayed in three different magazines.

Target market layout 1: (45–65 years) male and female, leisure cycling, working and retired singles and couples, grown-up families, TV influences: gardening and travel shows

Target market layout 2: (25–45 years) male and female, working, keen cyclists, adventure cycling, young families or no family commitments, TV influences: sport and Top Gear

Target market layout 3: (15–25 years) predominantly male, serious adventure and mountain biking, single, independent, TV influences: reality shows, indie and grunge music

The graphic designer has used a range of design elements and principles in each of the three layouts to appeal to the different target markets.

(a) Explain why the styles of typeface used in layout 1 will appeal to its target market. 2

(b) Explain how the use of shape enhances layout 2. 2

6. (continued)

In layout 2, three lines, two blue and one orange, are used.

- (c) Explain how each of these lines improves layout 2. Each of your explanations should be different.

3

Advancing and receding colours have been used in each of the layouts.

- (d) Select one of the layouts. Identify an advancing colour used in it, and describe the impact this colour has on the layout.

2

In layout _____ the advancing colour is _____.

The effect this colour has on the layout is:

Different forms of balance have been used in the layouts. In layout 1 the cyclists are placed off-centre, whilst in layout 2 the cyclist is placed in the centre of the layout.

- (e) (i) Explain one challenge that placing a main item in the centre of a layout gives the graphic designer.

1

6. (e) (continued)

- (ii) Explain the benefit of placing a main item off-centre in a layout (other than your answer to 6(e)(i)).

1

- (f) Explain three different ways in which the graphic designer has used design elements and principles in layout 3 to appeal to its target market.

3



7. Use "The Colour and the Shape" articles (layout A and layout B) from the Question 7 supplement provided to answer this question.

A graphic designer has created a magazine double-page spread for a home furnishing publication as shown in layout A. After development, the graphic designer enhanced the layout and produced a pre-press copy, layout B.

(a) Explain two reasons for using headers and footers in a multi-page document. 2

(b) Examine the feature shown below.

(i) State the name of this feature which is in each corner of layout B. 1

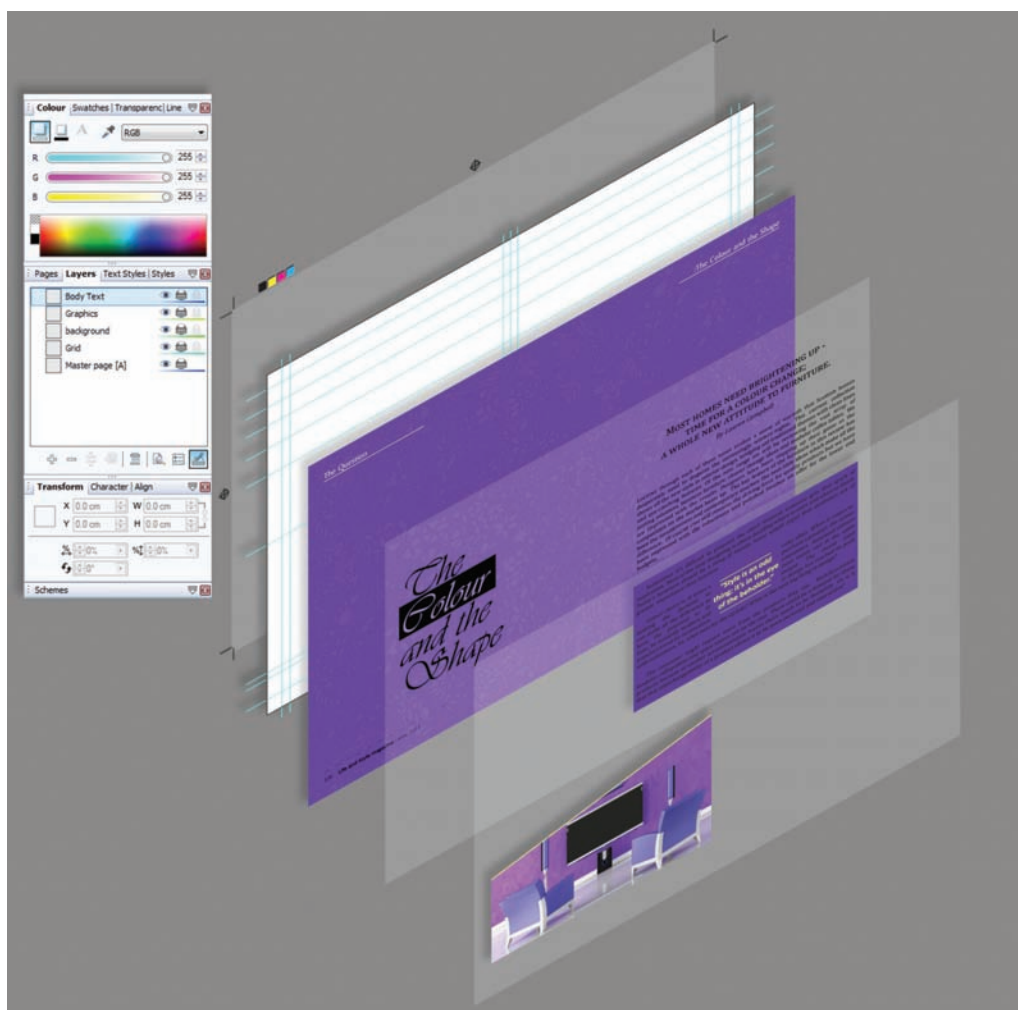


(ii) Explain the purpose of this feature. 1

(iii) Explain why the graphic designer used bleed in layout B. 1

7. (continued)

Examine the layering tree shown below.



(c) Describe layering as it is used in layout B in terms of the function and the benefits of layering for the graphic designer.

2



* S Q 2 2 H 0 1 2 0 *

7. (continued)

Examine **both** layout A and layout B.

Three DTP improvements have been made from layout A to layout B.

(d) Identify what these improvements are and explain their impact.

(i) Layout improvement 1 is: 2
and the impact is:

(ii) Layout improvement 2 is: 2
and the impact is:

(iii) Layout improvement 3 is: 2
and the impact is:

[END OF SPECIMEN QUESTION PAPER]



* S Q 2 2 H 0 1 2 1 *

Layout 1



Layout 2



Layout 3



* S Q 2 2 H 0 1 2 2 *

Layout A

The Question The Colour and the Shape

The Colour and the Shape

MOST HOMES NEED BRIGHTENING UP - TIME FOR A COLOUR CHANGE; A WHOLE NEW ATTITUDE TO FURNITURE.
By Lauren Campbell

LOFTING through each of these tones evokes a sense of warmth that Scottish homes desperately need to disguise the increasingly wintry nights. This current collection shows off the new style in interior design, bridging old traditional themes with clean lines and eye-catching features. Of the new range we will be reviewing the vast array of seating solutions, business furniture, clever storage ideas and modular coffee tables. We are impressed with the results. Designers have been stepping up their game as the competition on the market heats up. The key feature of the furniture in this review has been the inventiveness and contemporary touches; the neat little ideas which make all the difference. Of course cost still remains the driving force for quality products but we have been impressed with the robustness and polished finishes on offer for the lower end budgets.

Sometimes it's difficult to pinpoint the exact moment someone gets that spark of inspiration. Most of the time designing is about deciding where to start and when to finish. Today's furniture should be a thing of beauty. Some would argue that aesthetics are of greater importance than function.

Colour choice is, at times a risky affair. When it comes to making the decision to purchase a product, the colour can make all the difference to consumers. Autumnal colours have the potential to fit most tastes and at the same time, be instantly modern and popular. The recent (and in design has reached its peak with consumers. So, what next for the stylists? What is the next big thing in design?

The consumer might require more from the products they use. Multifunctional, modular, collapsibles and space savers are on the rise. There could be a demand for these products because of smaller accommodation means there needs to be flexibility. Or, is it that that interchangeability of a product allows it to be more personal and interactive?

"Style is an odd thing; it's in the eye of the beholder."



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Layout B pre-press copy

The Question The Colour and the Shape

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Colour choice is, at times a risky affair. When it comes to making the decision to purchase a product, the colour can make all the difference to consumers. Autumnal colours have the potential to fit most tastes and at the same time, be instantly modern and unique.

The recent (and popular) trend for minimalism in design has reached its peak with consumers. So, what next for the stylists? What is the next big thing in design?

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* S Q 2 2 H 0 1 2 3 *

ADDITIONAL SPACE FOR ANSWERS

MARKS DO NOT WRITE IN THIS MARGIN

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* S Q 2 2 H 0 1 2 4 *

ADDITIONAL SPACE FOR ANSWERS

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* S Q 2 2 H 0 1 2 5 *

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