

FOR OFFICIAL USE



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National
Qualifications
EXEMPLAR PAPER ONLY

Mark

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EP22/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

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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.

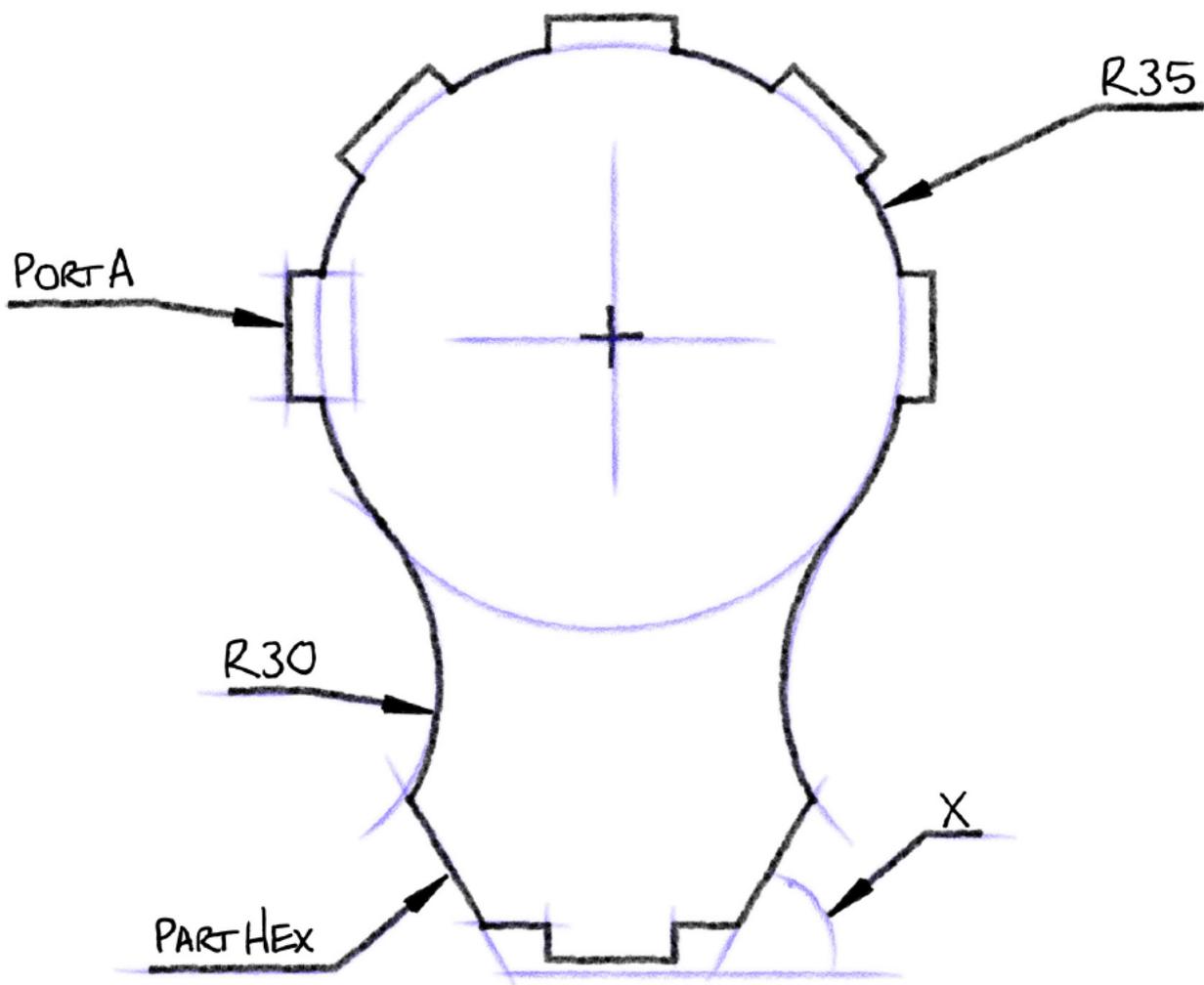
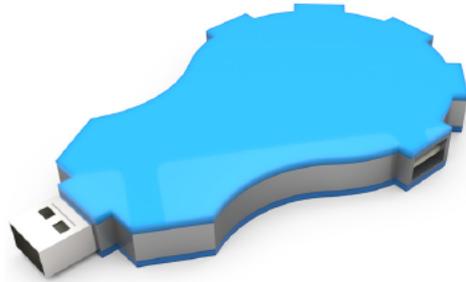
Before leaving the examination room you must give this booklet to the Invigilator; if you do not, you may lose all the marks for this paper.



Attempt ALL questions

Total marks — 70

1. A USB hub has been modelled by a CAD technician.



A 3D CAD model of the USB hub and its preliminary sketch are shown above.

1. (continued)

- (a) Describe, with reference to 2D drawing techniques, how you would create a tangent between the R30 and the R35 arcs. You may write your answer and/or sketch in the preliminary sketch on the previous page to support your answer if you prefer.

5

Manual method:

- mark centre and draw R35 circle
- add radius 30+35
- strike arc R65 from centre of R35 circle
- strike R30 arc from the corner of intersection between part X and arc
- draw the R30 arc from established centre

CAD method:

- draw R35 circle and constrain
- draw part hex and constrain
- draw R30 circle
- apply tangent constraints to circles R30 and R35

The USB adaptor has five ports around the upper arc. The CAD technician created a 2D drawing using the information on the preliminary sketch. When drawing the ports, port A was used as the starting point.

- (b) Describe, with reference to 2D CAD drawing techniques, how the CAD technician would draw the other ports. You may write your answer and/or sketch in the preliminary sketch above to support your answer if you prefer.

4

Descriptions will make reference to 2D CAD techniques including:

- draw rectangle and overlapping circle
- trim rectangle and circle
- correct description of polar (circular) array tool
- correct description of trimming

- (c) The USB hub is symmetrical about the vertical centre axis.
State angle X.

1

The angle is 60°

2.

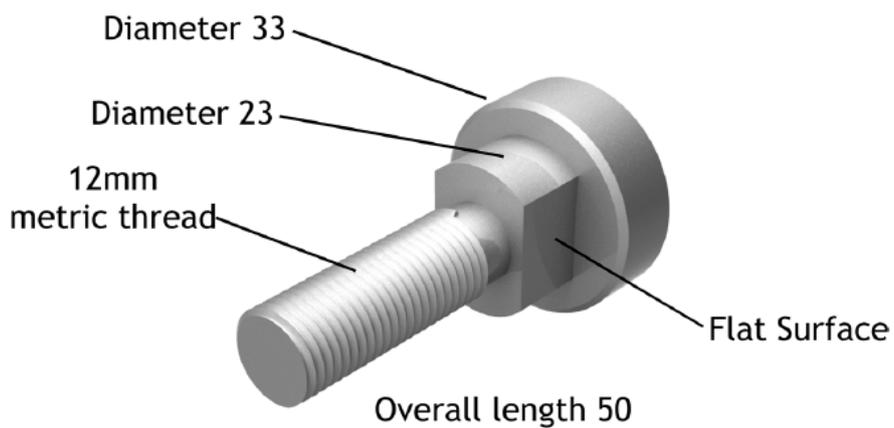


Threaded bolt

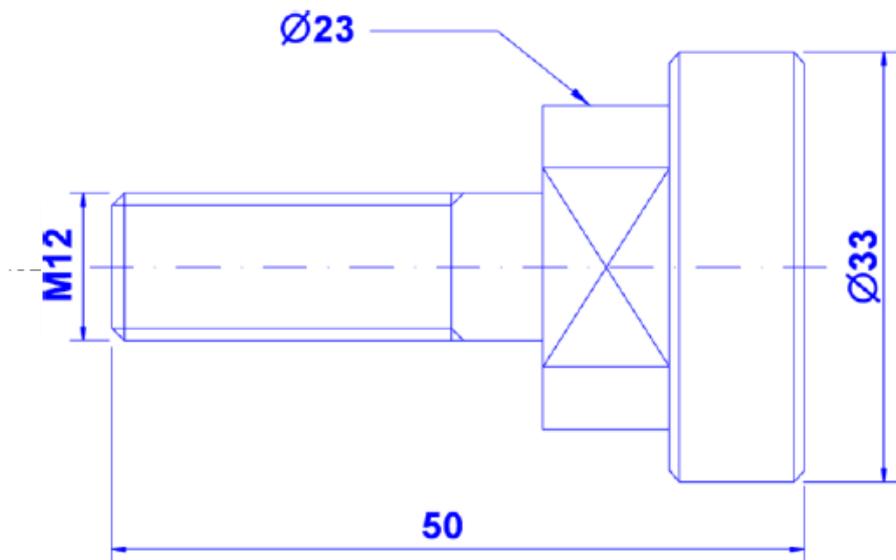
A threaded bolt is shown above.

Apply the following to the elevation below, taking account of British Standards conventions:

- (a) The lines to indicate a thread, at the correct location. 1
- (b) The four dimensions shown on the pictorial view, at their correct locations. 4
- (c) The symbol to indicate the flat surface, at the correct location. 1



Pictorial view



3. Infographics are a popular way of presenting statistical information.



(a) Explain how the design of the above infographic has been influenced by choice of images, colour and typeface, in attempting to communicate the information.

3

Image choice

- child – indicating that the subject matter relates to young people
- computer – indicating that the subject relates to computer/online activities
- male/female silhouette – indicating volume or statistic

Colour choice

- aggressive – stands out
- danger/warning

Typeface choice

- capitalisation
- mixture of font size
- formal font
- modern sans serif font – impact, reflecting contemporary issue

3. (continued)

The silhouette of the child at the top of the infographic was electronically captured and inserted into the DTP document.

- (b) Describe how a hard copy image could be captured and inserted into a DTP document, making reference to file type. 2

Any description is likely to include references to:

- scanning
- hand scanner
- flatbed scanner
- digital photograph
- digital capture
- some photocopiers

File type descriptions are likely to include references to:

- .jpg, .png, .bmp, .pdf, .gif, .tiff

The graphic designer decided to make digital copies rather than hard copies of the infographic.

- (c) Describe the advantages of this decision. 2

Any description is likely to include references to:

- savings of raw materials – ink, toner, paper, transportation costs
- savings of storage space (physical)
- savings of postal costs of transportation
- possible inaccuracy of printing processes

4. For this question, you must refer to the magazine layout shown in the supplement at the end of this Exemplar Question Paper.

- (a) State **two** instances where the graphic designer has created depth to add interest in the magazine layout. 2

Instances which use depth to add interest include:

- dropped shadows around the photographs
- layering of images over text
- layering of text over text
- variation in font size (red numbers)

- (b) State an example of emphasis in the layout **and** explain the effect created. 2

Emphasis has been created by:

- the use of red throughout the numbers within the document
- the use of a variety of point sizes in the text

Emphasis has the effect of:

- creating impact
- providing focus
- attracting the reader's attention

The graphic designer has made use of value in the magazine layout.

- (c) State where value has been used in the layout **and** explain the effect it has. 2

Value has been used in the layout in the "2014" graphic.

- The effect it has on the application of value is that it adds/contributes to depth in the layout.

- (d) Describe how the graphic designer has created an informal and interesting look to the magazine layout. 2

Description will make references to features such as:

- large variety of font sizes used
- lack of grid formal structure
- rotation of images
- layering of images
- use of bleed in image and title font

4. (continued)

(e) State where rhythm has been used in the magazine layout.

1

Instances where rhythm has been used are in the:

- continued use of red in titles
- rhythm of shape (rectangular images)
- subtle rotations of images
- subtle left alignment of text

Throughout the magazine layout, the graphic designer has made use of varied proportion.

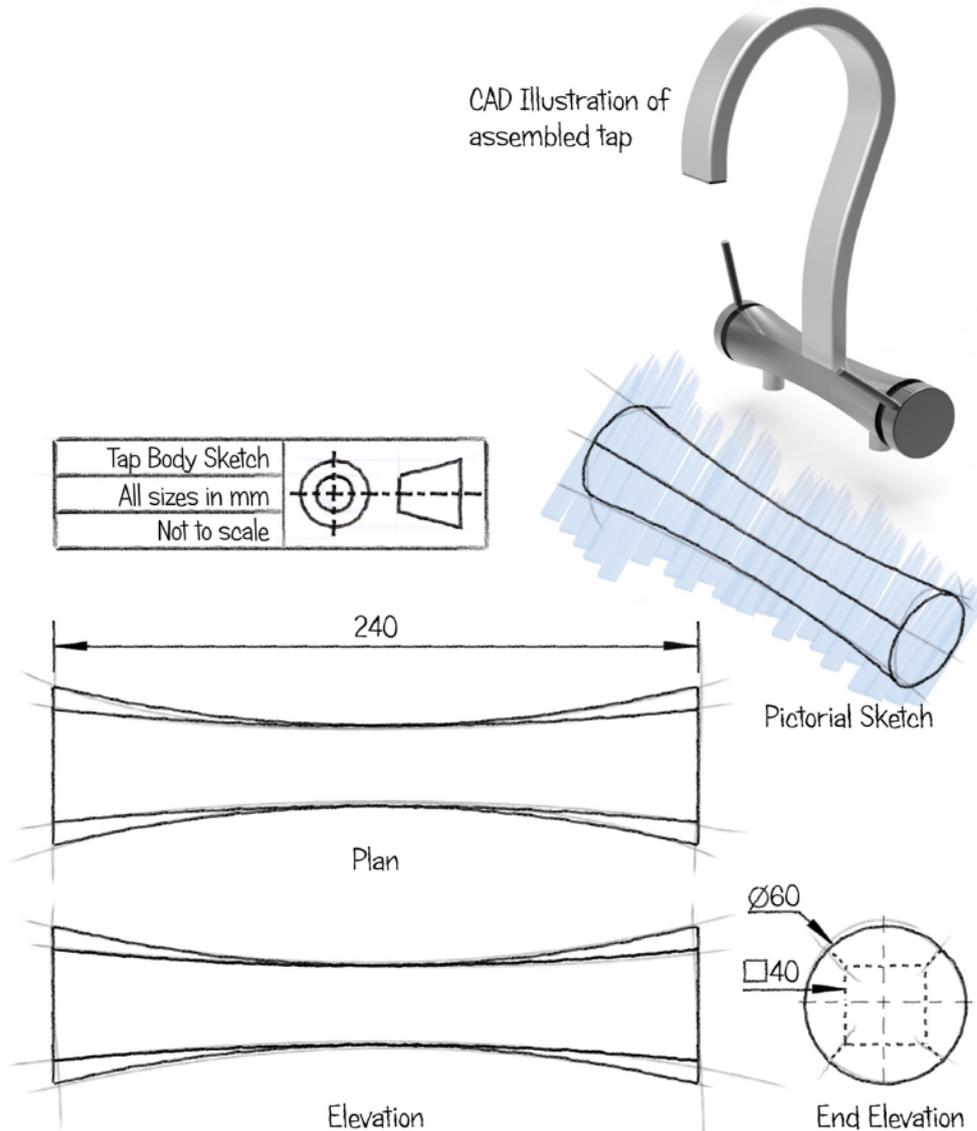
(f) Explain what effect the use of varied proportion has on the magazine layout.

2

Explanations of the effect of the use of varied proportion, will make references to varied proportion:

- being less formal
- being engaging and interesting
- giving the impression of movement (reflecting sporting activity)
- creating multiple focal points

5.



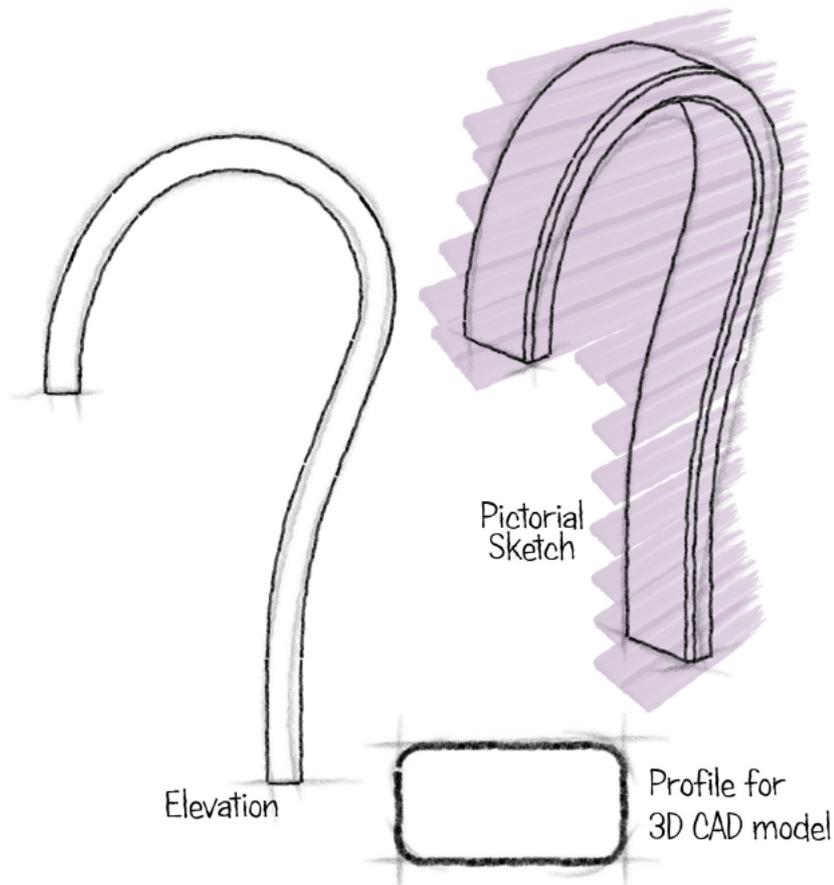
Preliminary sketches of a tap body and an assembled 3D CAD model of the tap are shown above.

- (a) Describe, with reference to 3D CAD modelling techniques, how the tap body can be modelled. You should make references to the dimensions shown above.

3

1. Three profiles – 40 mm square, diameter 60mm, diameter 60 mm
 2. Loft
 3. Offset work planes – 240 mm with middle plane at 120 mm
- or
1. Two profiles – 40 mm square, diameter 60 mm
 2. Loft
 3. Offset work plane – 120 mm and mirror feature

5. (continued)



Preliminary sketches of the neck of the tap are shown above.

- (b) Describe, with reference to 3D CAD modelling techniques, how the neck of the tap can be created and hollowed to allow water to flow through it.

2

Descriptions will make references to:
“Sweep along a path” and “shell.”

5. (continued)

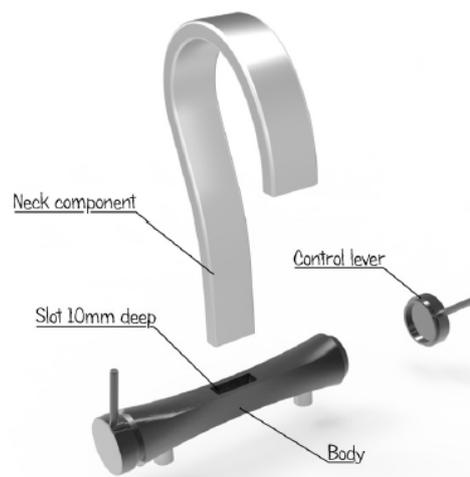


Fig 1

A partially assembled 3D model of the tap is shown in Fig 1 above.



Fig 2

The tap components shown in Fig 2 above were created using a “bottom up” approach.

(c) Describe “bottom-up” CAD modelling.

2

Bottom-up CAD modelling involves the creation of individual components and subsequent assembly, using appropriate constraints

5. (continued)

- (d) (i) Describe, with reference to constraints, how the neck and body components of the tap will be assembled.

2

The description will include references to:

align, align, mate

or

mate, mate, mate

or

centre axis, centre axis, mate

- (ii) Describe, with reference to constraints, how the control lever and body components of the tap will be assembled.

2

The description will include references to:

Centre axis (1 mark) and mate (1 mark)

6. Graphic design is often used to provoke an emotional response. “Save the Children” ran a campaign in 2006 using the graphic below.



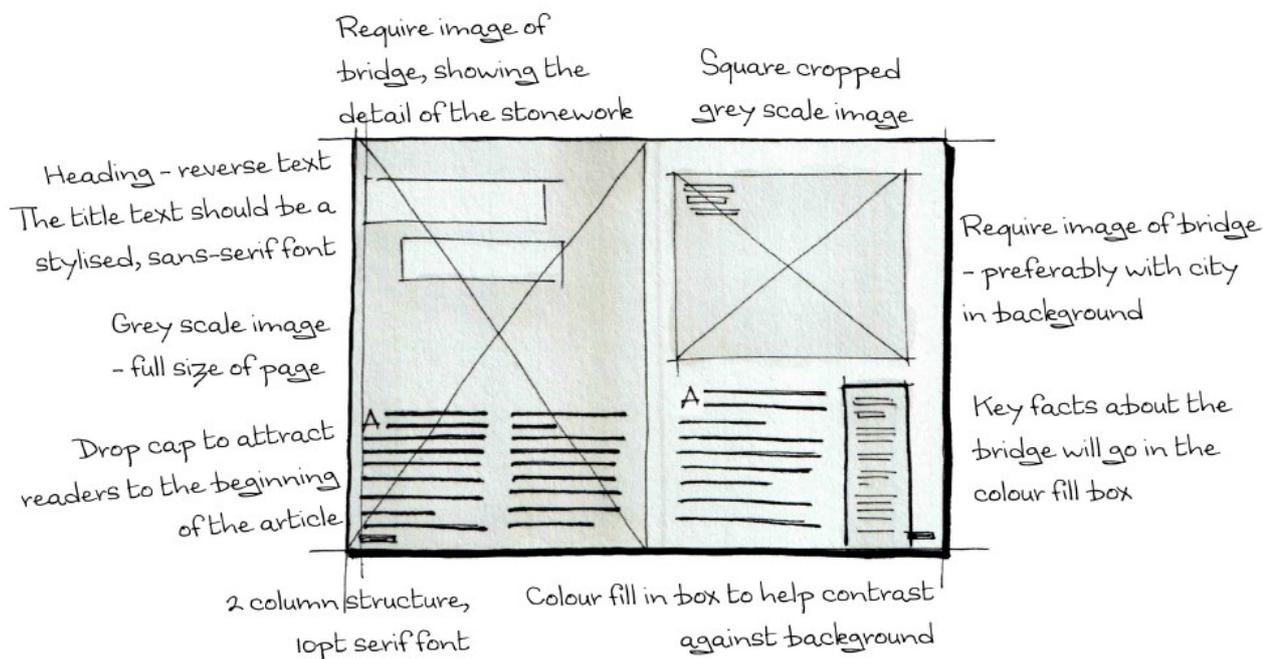
Explain how the various elements of the graphic have been used to achieve maximum impact.

4

Explanations will include references drawn from the:

- use of bold colours
- use of black, emphasising morbidity or mortality
- child-like quality of production (images)
- child-like quality of production (text)
- colour scheme draws focus to the charity logo
- contrast between connotations of rifle and pencil (war and education)
- cross-over in trend (indicating more education less conflict)

7.



A thumbnail graphic is shown above.

Thumbnails are used extensively by graphic designers to explore and develop ideas.

(a) State two reasons why thumbnails are not appropriate to communicate ideas with a client.

2

Reasons can include:

- insufficient detail/information
- no images included
- no text
- no typeface
- colours may not be representative of the final graphic
- annotations on the thumbnails may not make sense/be appropriate to the client
- it may change significantly in the subsequent stages of the development

7. (continued)



The graphic designer decided to make use of stock photographs, such as that shown above, for the publication. These were purchased online.

(b) Describe one advantage and one disadvantage of using stock photographs.

2

Advantages:

- access to high quality images
- an extensive range of images
- broad range of subjects/topics
- constantly refreshing the stock/content
- image size can be selected
- easy to browse

Disadvantages:

- financial/monetary/cost implications
- image may not be exactly what is needed/preferred/desired
- potentially large file sizes – therefore potential to slow productivity where larger numbers of images are required

7. (continued)



“Drop caps” have been applied at the beginning of the body text on each page of the draft layout shown above.

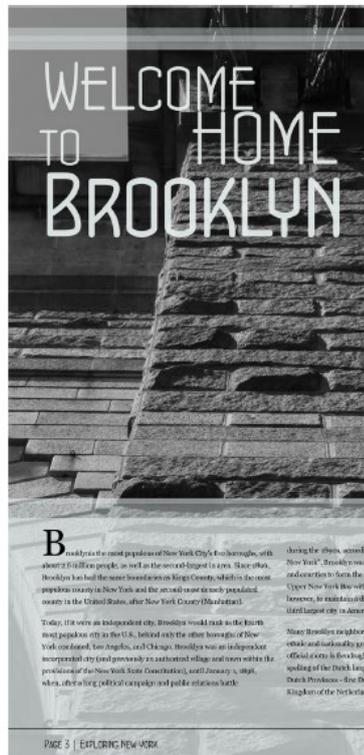
(c) Describe a problem that the reader may experience with this approach. 1

The reader may consider this to be two separate articles.

(d) Explain the issue the graphic designer could face when adding reverse text upon a greyscale image. 1

If there is too much white in the greyscale image, the title may be too hard to read/or be illegible/or reduce emphasis.

7. (continued)



Part of the layout is shown above.

(e) Describe, with reference to the part layout, how the graphic designer has made use of the following terms.

(i) Justification

1

Text justification on the layout is left justified

(ii) Alignment

1

The title and the left hand column of text are aligned

(iii) Gutter

1

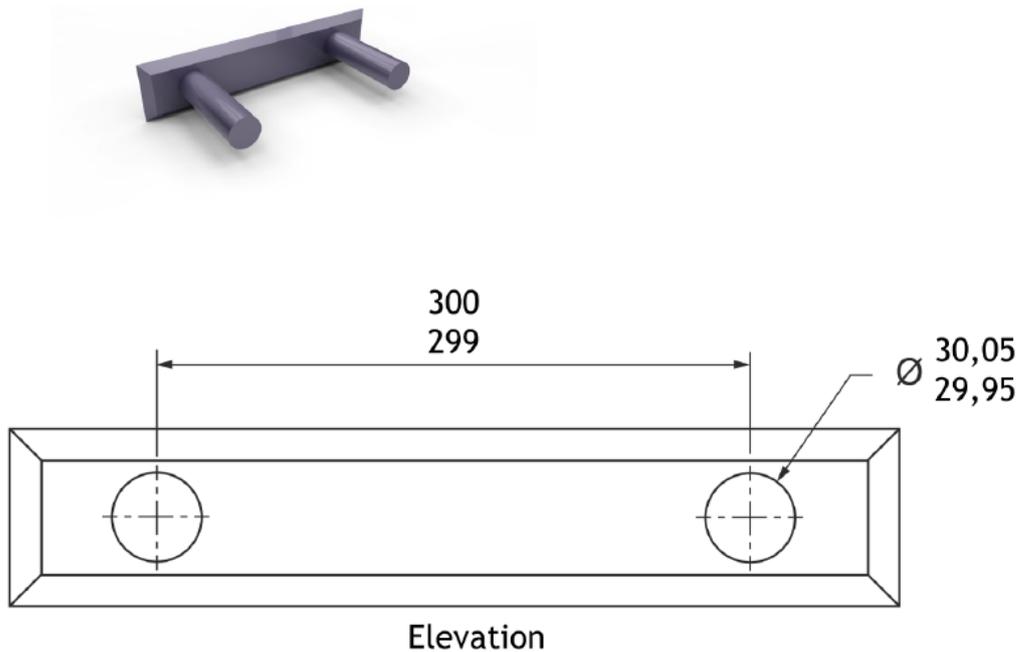
A gutter has been used between the two body text columns

(iv) Transparency

1

The body text has been placed in a transparency, as the background can be seen through it to an extent

8.



A 3D CAD model and elevation of a bracket are shown above.

The location pins, each $\text{Ø}30$ mm, are set apart at 300 mm nominal centres. There are tolerances on both the **sizes and location** of the pins.

- (a) Calculate the maximum and minimum gap between the pins.

2

Maximum

$$\text{Maximum } 300 - 29.95 = 270.05 \text{ mm}$$

Minimum

$$\text{Minimum } 299 - 30.05 = 268.95 \text{ mm}$$

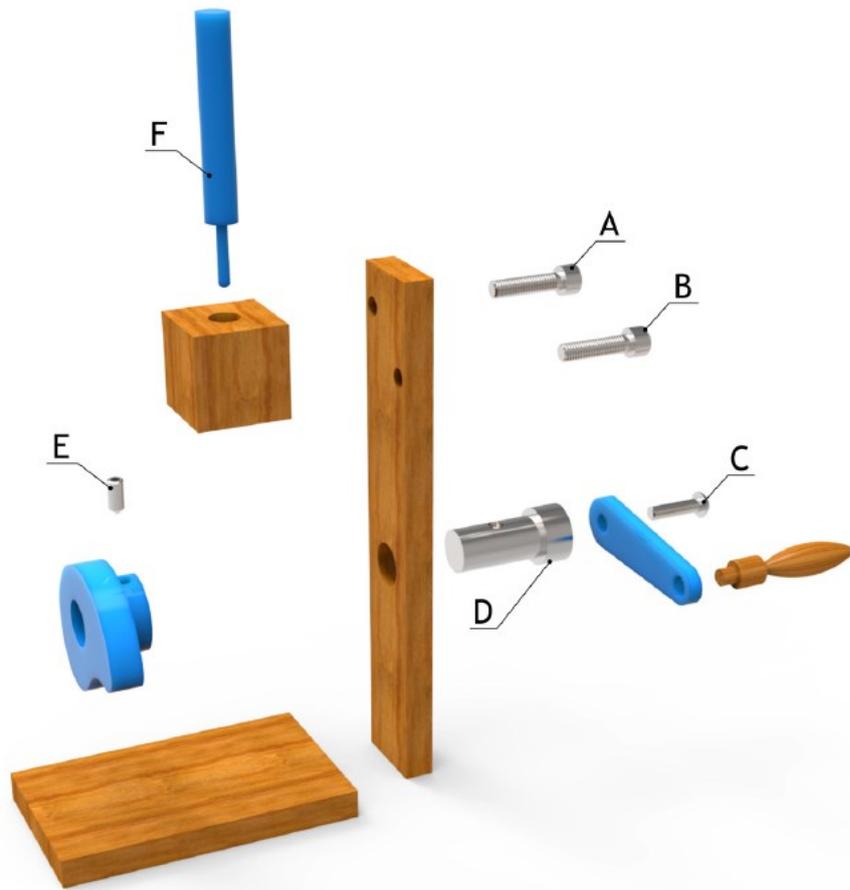
- (b) Explain why tolerances are an important feature in production drawings for manufacturing.

2

Cost – the more accurate an item needs to be, the higher the cost

- Time to produce – the more accurate an item, the longer it will take
- Affects the function of the product
- Affects the inter-changeability of the product

9.



Exploded model

An exploded model of a mechanical device is shown above.

