FOR OFFICIAL USE

National Qualifications
ADDITIONAL QP RESOURCE

Mark

X861/75/01 Practical Metalworking

Duration — 1 hour

X8617501

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth

Day | Month | Year

Scottish candidate number

Total marks — 60

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.

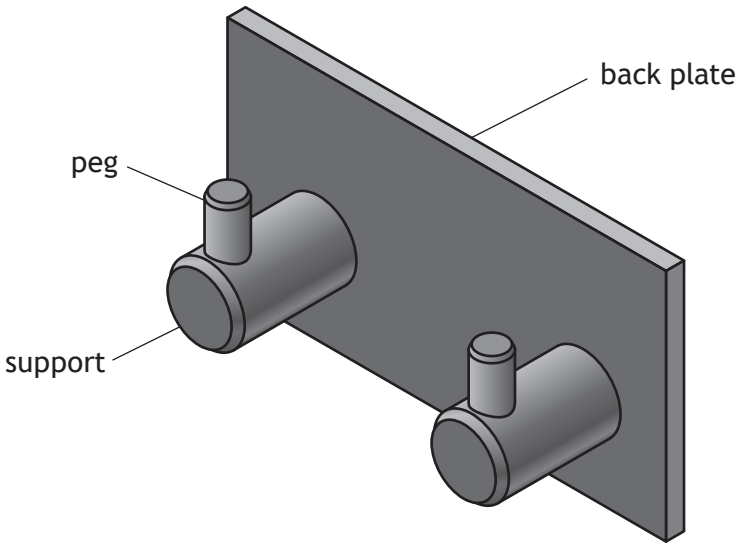
Use **blue** or **black** ink.

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.

Total marks — 60

Attempt ALL questions

1. A double coat hook made from non-ferrous metal is shown below.



(a) State the name of **two** suitable non-ferrous metals that could be used to manufacture the coat hook. **2**

1 _____

2 _____

(b) State **one** reason for manufacturing the coat hook from a non-ferrous metal. **1**

_____

_____

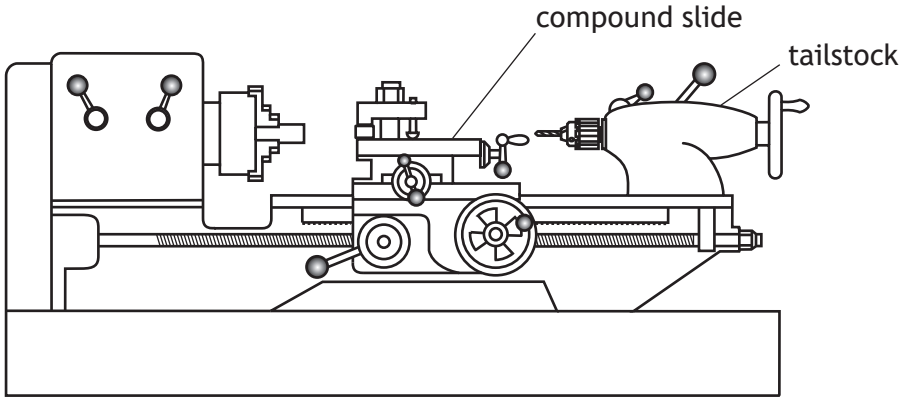
The tool shown below was used in the manufacture of the coat hook.

(c) Name this tool. **1**

_____

1. (continued)

The centre lathe shown below was used to manufacture the supports and pegs of the coat hook. The compound slide and tailstock have been highlighted.



(d) (i) State **two** uses of the compound slide. **2**

1 _____

_____

2 _____

_____

(ii) One use of the tailstock is to hold a Jacobs chuck, which allows drilling to take place.

State **one** other use of the tailstock. **1**

_____

_____

(e) Explain **one** safe working practice that you should follow, other than wearing personal protective equipment, to avoid being harmed by hot pieces of metal, when working on the centre lathe. **1**

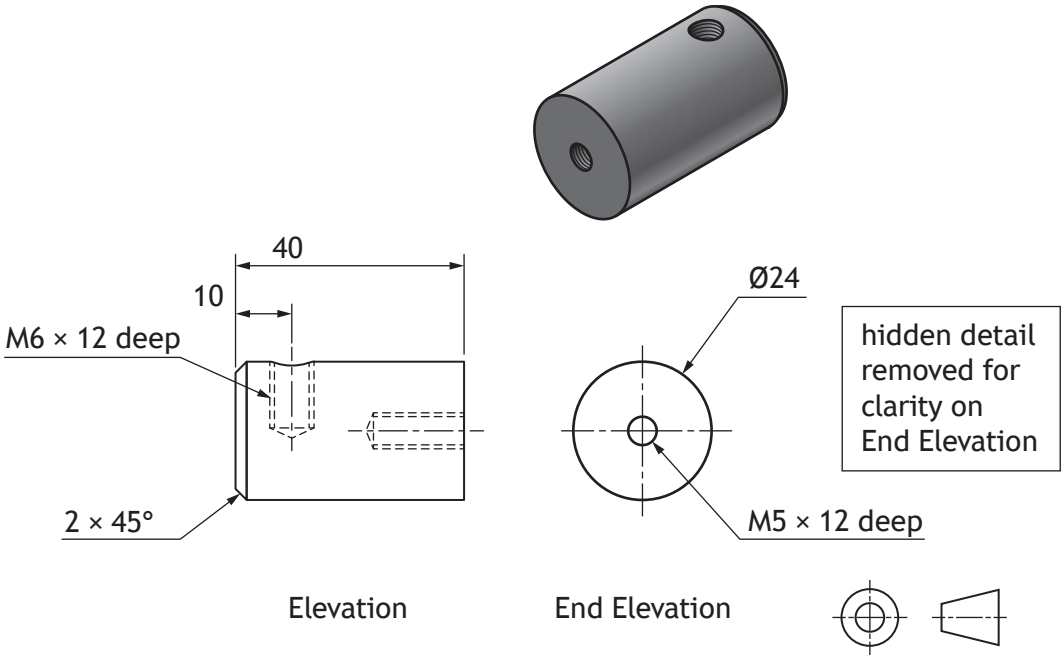
_____

_____

[Turn over

1. (continued)

A working drawing of the coat hook support is shown below.



(f) (i) State the meaning of the symbol 'Ø' on the working drawing. **1**

_____

_____

(ii) Name the centre lathe process that is used to reduce the size of the support to Ø24 mm. **1**

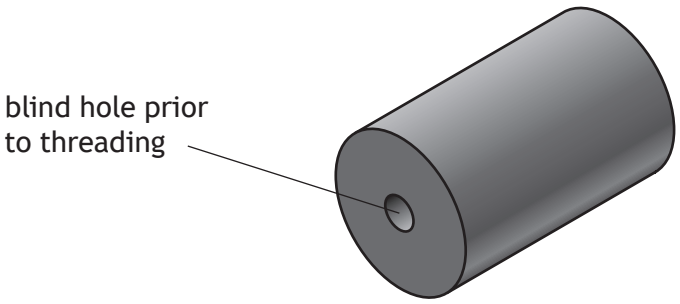
_____

(iii) Name the centre lathe process that is used to reduce the length of the support to 40 mm. **1**

_____

1. (f) (continued)

The support with the blind hole drilled prior to threading is shown below.



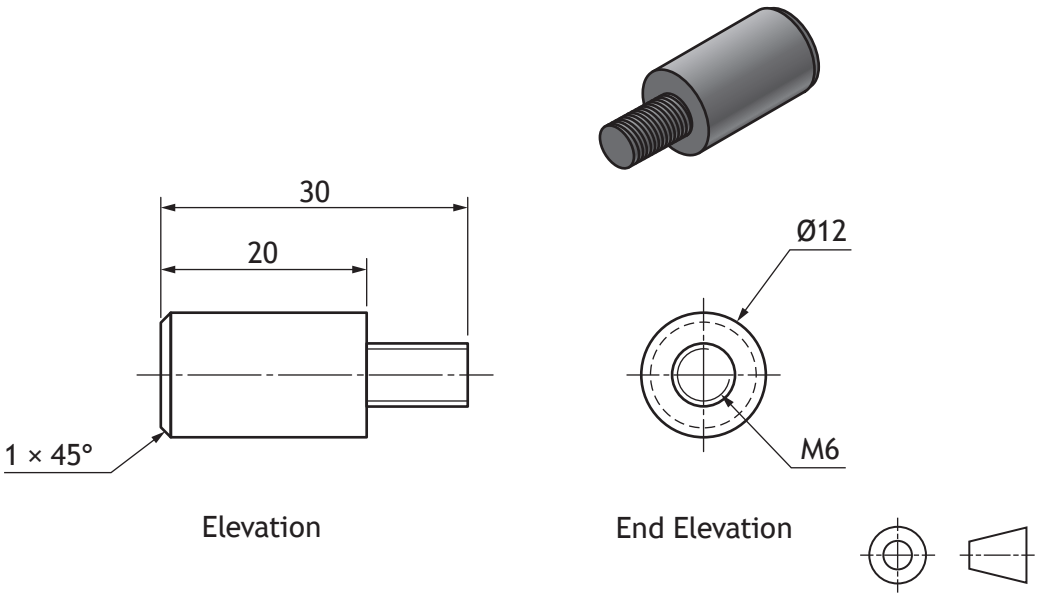
(iv) Describe how to manufacture the blind hole on the centre lathe.

You must make reference to correct dimensions, machine processes and tools.

You may use sketches to support your answer. **3**

1. (continued)

A working drawing of the coat hook peg is shown below.



(g) State the name of the hand tool used to cut the M6 thread on the peg. **1**

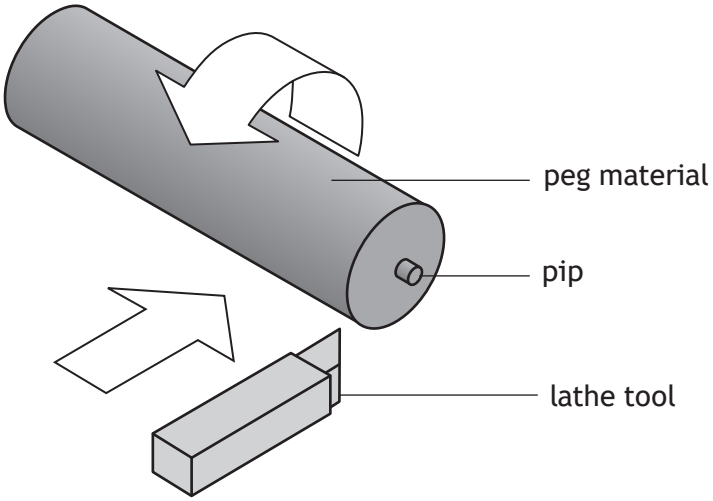
An extract from the cutting list is shown below.

Part	Number	Material	Length	Breadth	Thickness
peg	2	non-ferrous metal	90 mm	Ø12	N/A

(h) Explain **one** reason why the length of the peg material on the cutting list is 90 mm. **1**

1. (continued)

When reducing the length of the peg material, a 'pip' remained on the end as shown below.



(i) Describe **one** reason that could cause the 'pip'. **1**

_____

_____

(j) State **two** reasons why a change in centre lathe speed may be necessary when machining metal. **2**

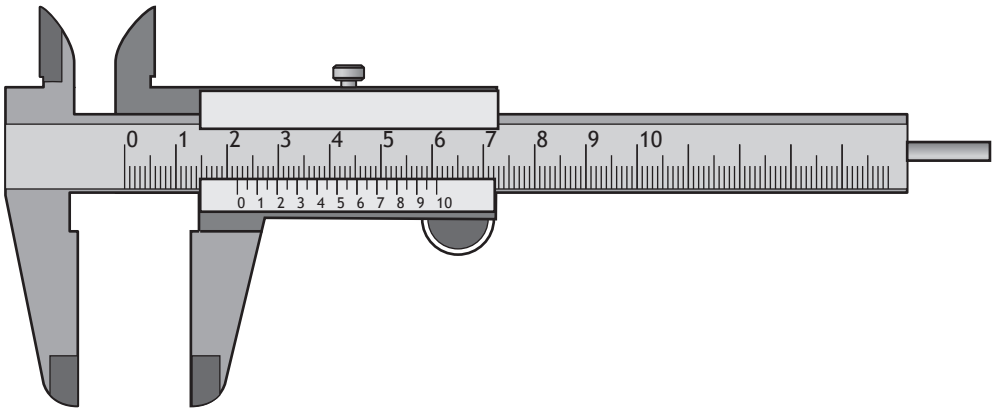
1 _____

2 _____

[Turn over

1. (continued)

The tool shown below was used to check various dimensions during the manufacture of the coat hook.



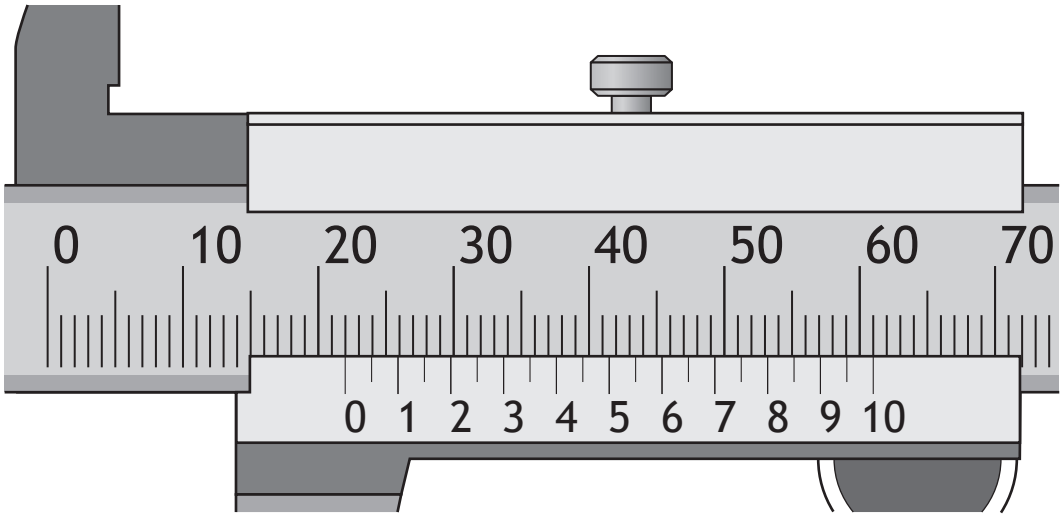
(k) Name this tool. **1**

_____

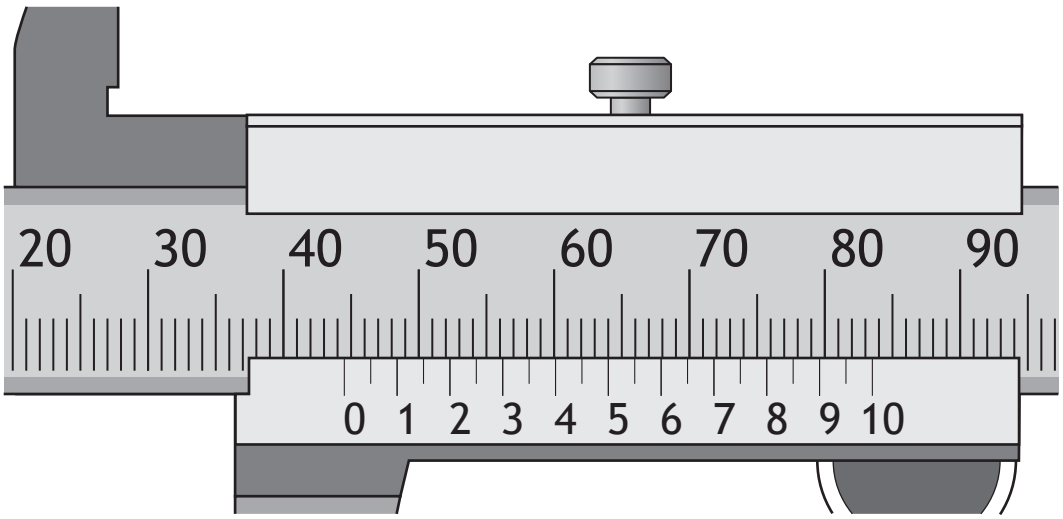
1. (continued)

Two readings from the tool are shown below.

(l) State the correct readings shown below.



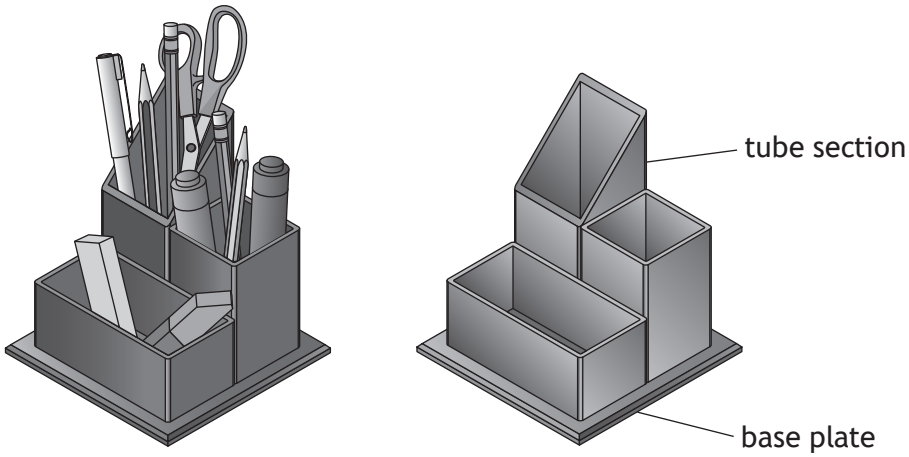
(i) Reading A _____ **1**



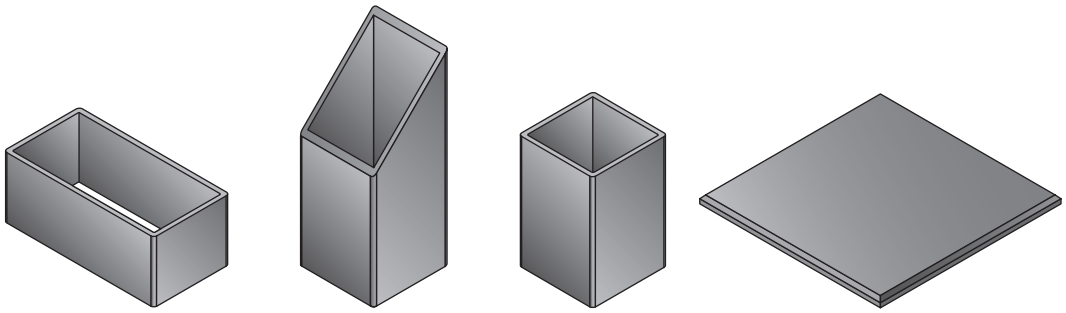
(ii) Reading B _____ **1**

[Turn over

2. A handmade desk tidy made from four separate parts is shown below.



The individual parts A,B,C and D (below) are made from both steel tube section and steel plate.



part A part B part C part D

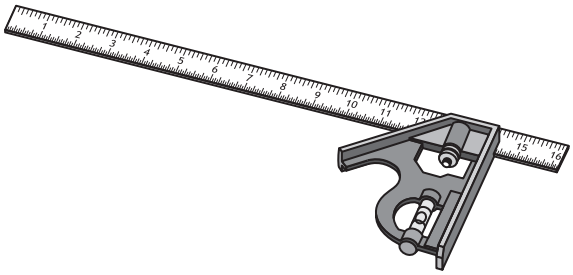
(a) Explain **one** reason why the desk tidy is suitable for the recycling process. **1**

Steel is made from carbon and a metal.

(b) Name the metal. **1**

2. (continued)

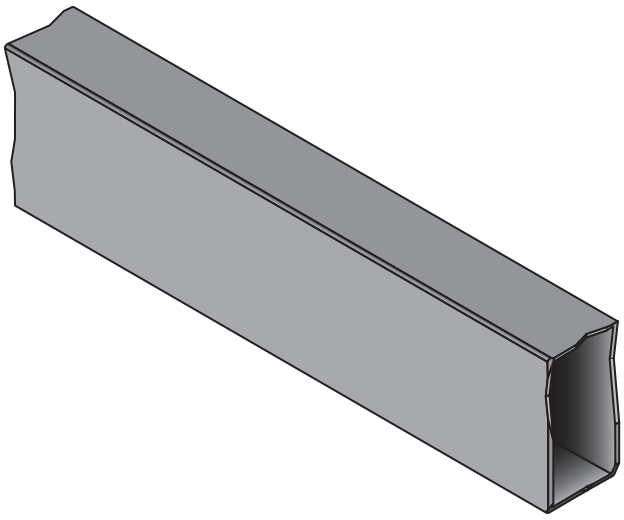
The tool shown below was used in the manufacture of the desk tidy.



(c) (i) Name this tool. **1**

(ii) Describe **one** purpose of this tool. **1**

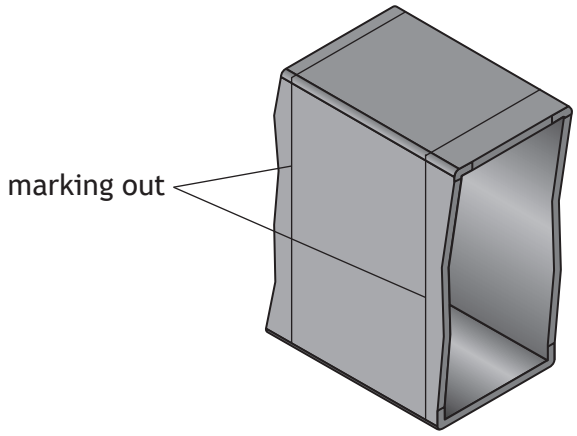
The tube section, from which part A is to be cut, is shown below. It was rough cut at both ends.



(d) (i) Name the hand tool that would be used to cut part A from the tube section. **1**

2. (d) (continued)

Part A is marked out and cut as shown below.



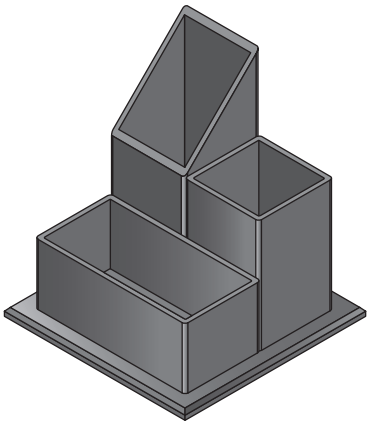
(ii) Describe how part A is finished to the correct size and made safe for use.

You must make reference to all tools and processes.

You may use sketches to support your answer. **4**

2. (continued)

The four parts of the desk tidy were welded together as shown below, using an electric arc welder.



desk tidy

(e) The table below shows the steps required to achieve a high quality weld using an electric arc welder.

These steps have been placed in the **wrong order.**

Number these steps into the correct order.

Two steps in the correct order have been given for you. **4**

Steps	**Order**
Strike the electrode against the surface of the metal, pulling it back slightly when you see an electric arc occur.	
Ensure the material to be welded is free from paint, rust, grease or any other contaminate.	1
Ensure the welder is set to the correct amperage range and the correct size of electrode rod is chosen for the material of the desk tidy.	
Ensure the material to be welded is clamped/held together securely and is fully earthed onto an appropriate welding surface.	3
Chip off the slag and clean with a wire brush.	
Keep the arc established as you move along the weld, moving at a consistent speed and in line with the path you want to weld.	

2. (continued)

An alternative to an electric welder is a MIG welder.

(f) Describe **two** main differences between the welders. **2**

1 _____

_____

_____

2 _____

_____

_____

(g) State **three** pieces of personal protective equipment that should be worn when welding. **3**

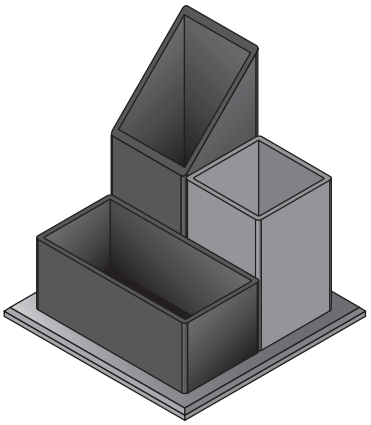
1 _____

2 _____

3 _____

2. (continued)

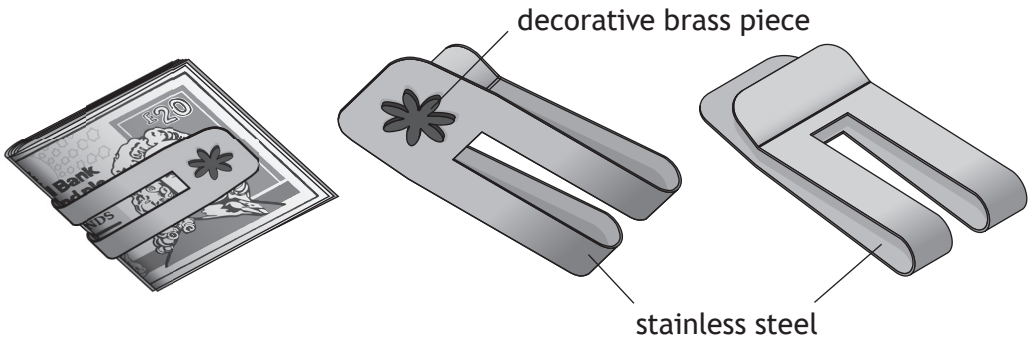
After assembly, the desk tidy was finished in two different colours/shades with oil-based paints, as shown below.



painted desk tidy

(h) Describe how a high-quality finish can be achieved on the desk tidy, using oil-based paints. **4**

3. A handmade money clip is shown below.

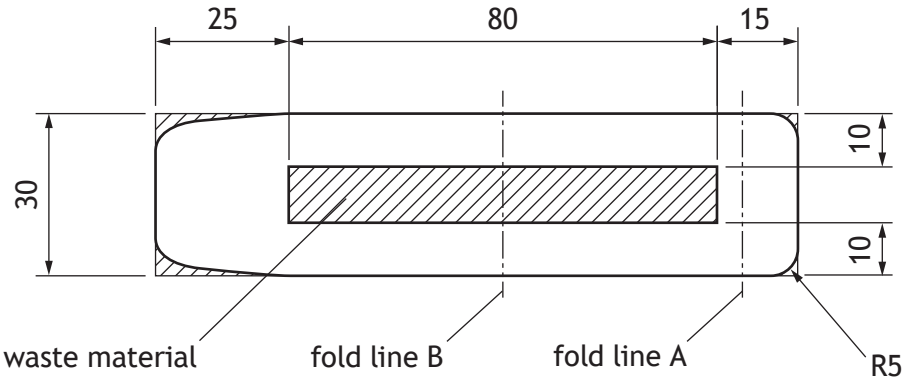


The money clip is made from a rectangular piece of stainless steel with an added decorative piece made from brass.

(a) Both brass and stainless steel are alloys.

Explain what is meant by the term alloy. **1**

The working drawing below shows the money clip before it was folded into shape.



(b) State the length of the money clip before it was folded. **1**

_____ mm

3. (continued)

(c) (i) Describe how to accurately mark out the rectangular waste material in the centre of the money clip.

You must make reference to all tools, processes and relevant dimensions.

You may use sketches to support your answer. **4**

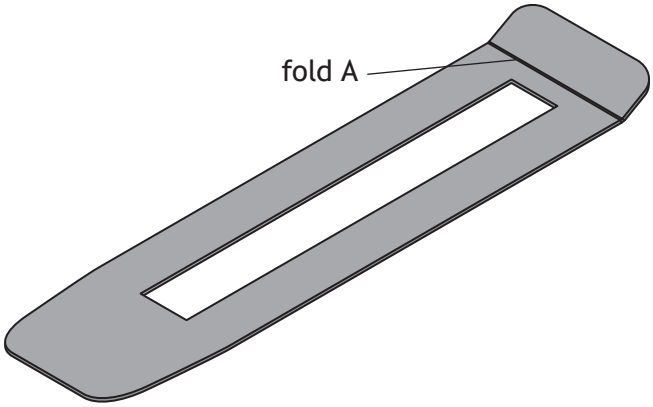
(ii) Describe how to remove the waste material from the centre of the money clip.

You must make reference to all tools and processes.

You may use sketches to support your answer. **3**

3. (continued)

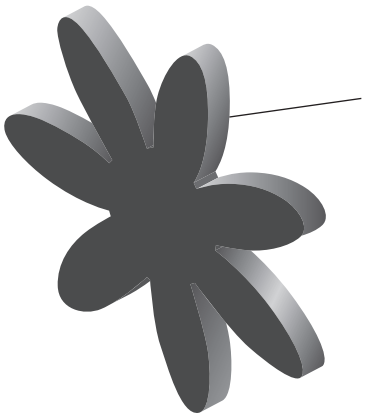
Fold A is bent to an angle of 30° as shown below.



(d) Describe, using correct terminology, how to form fold A.
You must make reference to all tools, processes and relevant dimensions.
You may use sketches to support your answer. **2**

3. (continued)

The small decorative brass piece was cut from scrap material using hand tools.



(e) Explain **two** environmental benefits of using scrap material. **2**

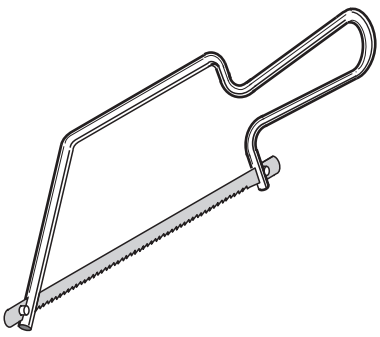
1 _____

_____

2 _____

_____

The tool shown below was used to cut the decorative brass piece.



(f) Name this tool. **1**

_____

[Turn over for next question

3. (continued)

(g) The decorative brass piece will be joined to the money clip using a suitable adhesive.

(i) State the name of a suitable adhesive. **1**

_____

(ii) Name a thermal joining process that could be used to join brass to stainless steel, as an alternative to using an adhesive. **1**

_____

[END OF QUESTION PAPER]

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ADDITIONAL SPACE FOR ANSWERS

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