Candidate 4 evidence

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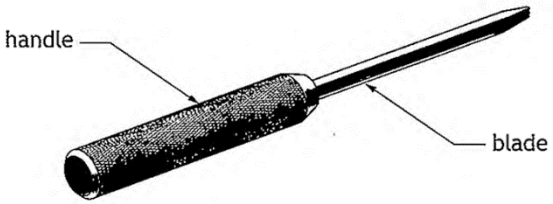
Total marks — 60

Attempt ALL questions

1. A handmade screwdriver, made of two separate parts, is shown below.



The blade is made from high carbon steel. High carbon steel is a ferrous metal.

(a) Explain what is meant by the term 'ferrous metal'. 1

Ferrous Metal Contains iron
Ferrous metal is Strong
Ferrous doen't rust

(b) State one property of high carbon steel that makes it suitable for the screwdriver blade. 1

Strong
Durable.

When material is delivered to a metal workshop, it comes in a range of sections.

(c) Name each of the two common sections shown below.

(i)  Treated 1

(ii)  Rought 1

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1. **(continued)**

(d) The screwdriver blade was hardened and then tempered.

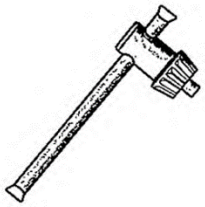
(i) Describe the process of **hardening** the screwdriver blade. 3

First the metal is cleaned and degreased. Then the metal is heated up and battred

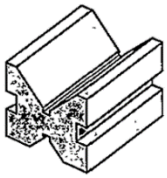
(ii) Explain the effect of **tempering** the screwdriver blade. 1

make it stronger. more grip.

The tools shown below were used during the manufacture of the screwdriver handle.



Tool A



Tool B

(e) Name each of the tools shown.

(i) Tool A Key. 1

(ii) Tool B Folding Block 1

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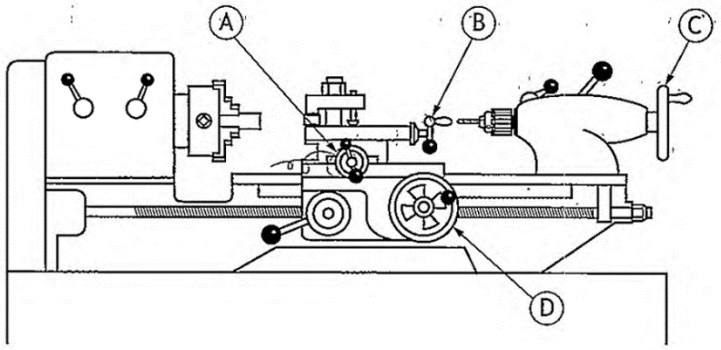
1. **(continued)**

The machine shown below was used in the manufacture of the screwdriver handle.



(f) Name this machine. 1

Leath.

(g) Describe three safety checks that should be carried out on this machine **before** switching it on. 3

1 The speed of the machine.

2 Bit of metal is secure in the chuck. Gurad is down.

3 Hair is tied back and glasses are on

* Everything is in working order

* ~~the~~ chuck key is remaved.

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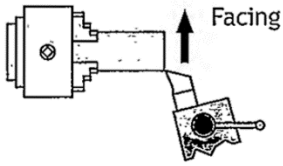
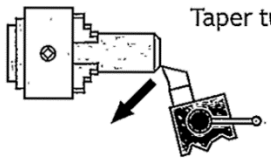
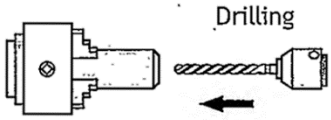
1. (continued)

Handles A, B, C and D, shown on the machine opposite, were used during the manufacture of the screwdriver.

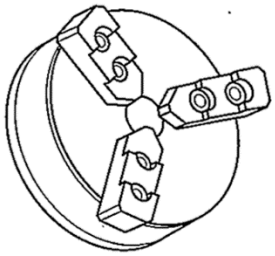
(h) Identify the correct handle to use when carrying out the processes shown below.

(i)  Facing off Handle B 1

(ii)  Taper turning Handle A 1

(iii)  Drilling Handle C 1

A 3-jaw chuck for holding the handle is shown below.



(i) State the feature of a 3-jaw chuck which makes it suitable for holding the screwdriver handle. 1

Tighten all the way round which holds the metal securly

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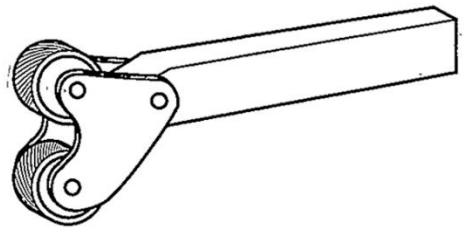
1. **(continued)**

The knurling tool, shown below, was used during the manufacture of the screwdriver handle.



(j) State two procedures that ensure a high quality finish is achieved when knurling. 2

1 The Knurl looks even and feels smooth.

2 The Knurling Balls stop turning

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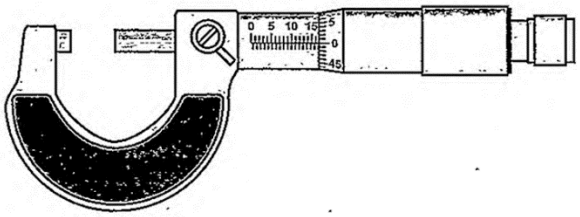
.. **(continued)**

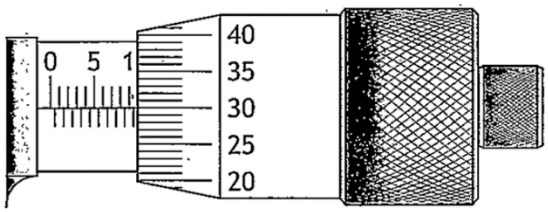
The micrometer, shown below, was used to check diameters during the manufacture of the screwdriver handle.



Two readings from the micrometer are shown below.

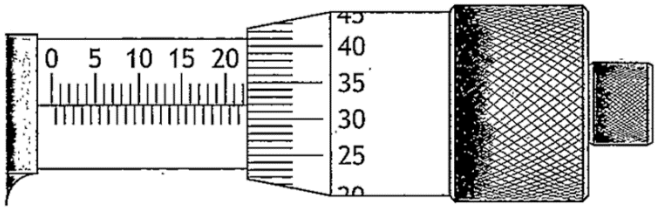
(k) State the correct readings.

A



(i) Reading A 1.01 30 1

B



(ii) Reading B 20.3 32 1

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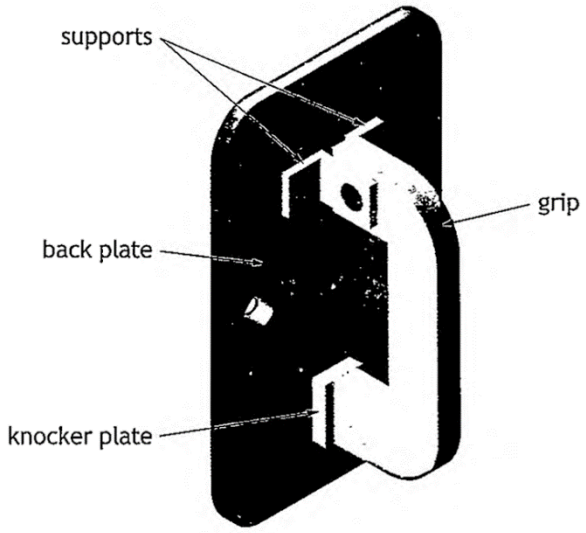
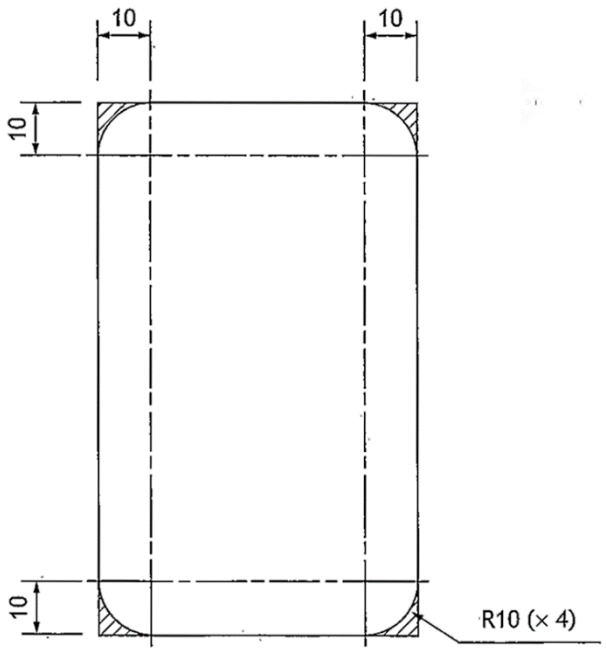
2. A handmade door knocker is shown below.



The back plate has to be marked out, as shown on the drawing below.



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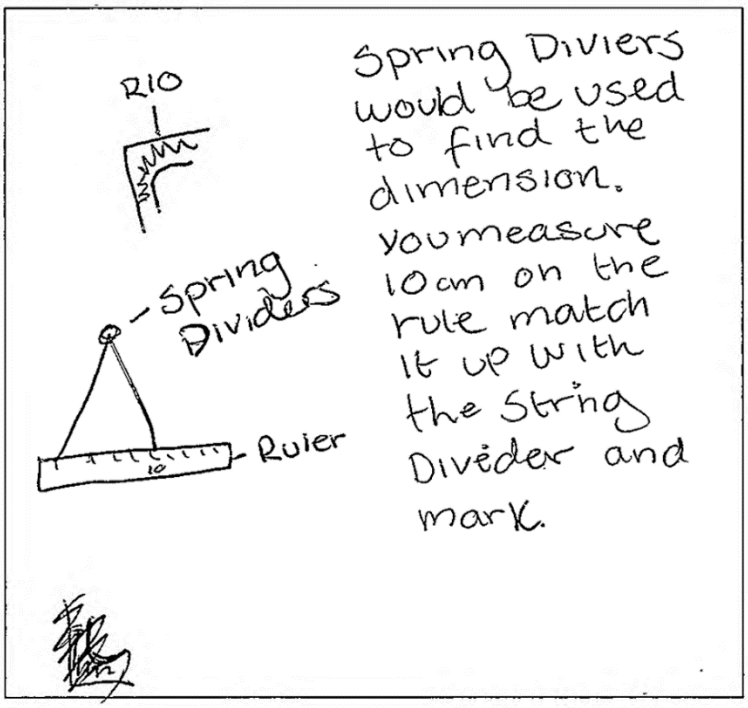
2. (continued)

(a) (i) Describe how to accurately mark the R10 on the corners of the back plate. **5**

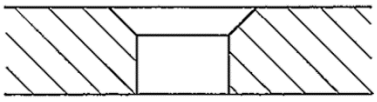
You must make reference to all tools, processes and relevant dimensions.

You may use sketches to support your answer.



Spring Diviers would be used to find the dimension. you measure 10cm on the rule match it up with the String Divéder and mark.

A cross section of the back plate showing the hole for a countersink screw is shown below.



(ii) Explain the purpose of using a countersink screw. **1**

So when you begin to Drill Countersink stops the metal slipping Drill Finds the hole easier

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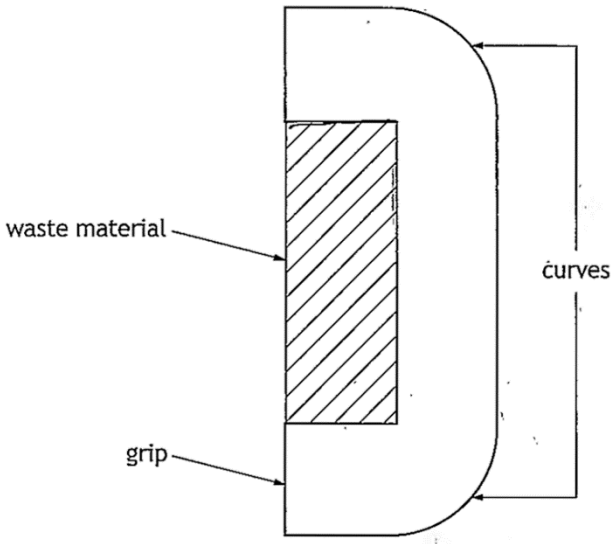
2. **(continued)**

This drawing shows how the grip was marked out, prior to removing the waste material.



(b) (i) Describe how to remove the waste material. 3

You must make reference to all tools and processes.

You may use sketches to support your answer.

First you would use a steel ruler to mark out the waste material

Then put the metal securly in a Engineers Vice. to make sure it mark correctly

NOW you would cut out the Raw material with the gilitern. (making sure its only Raw material you are chopping)

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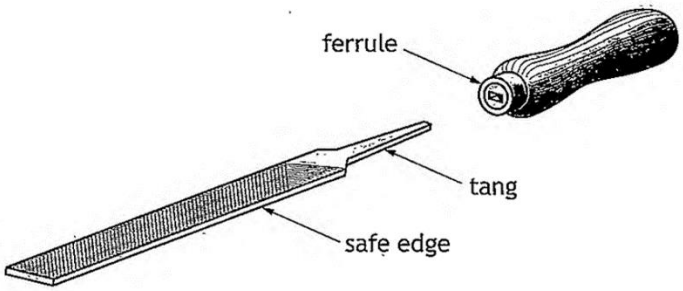
2. (b) (continued)

A flat file was used to shape the curves. Parts of a flat file are shown below.



(ii) State the purpose of the following parts of the flat file. 3

Ferrule Holds the File (safe edge) with the handle (comets (them)

Tang The Tang marries into the Ferrule as one

Safe edge IS the file itself files metal

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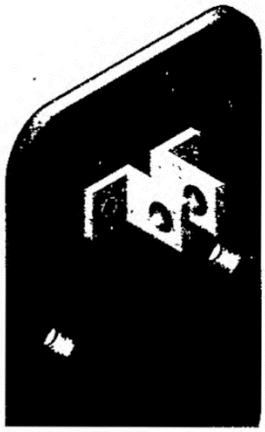
2. (continued)

The supports are joined to the back plate using rivets.



(c) Name the types of rivet shown below.

(i) 

Rivet type pop rivit. 1

(ii) 

Rivet type Round head rivit 1

(iii) 

Rivet type Flat head rivit. 1

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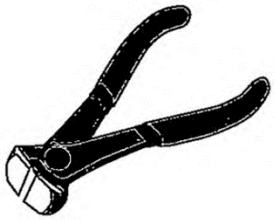
2. (continued)

The tools shown below are used during riveting.

Tool A



Tool B

(d) (i) Name Tool A. 1

punch Bar

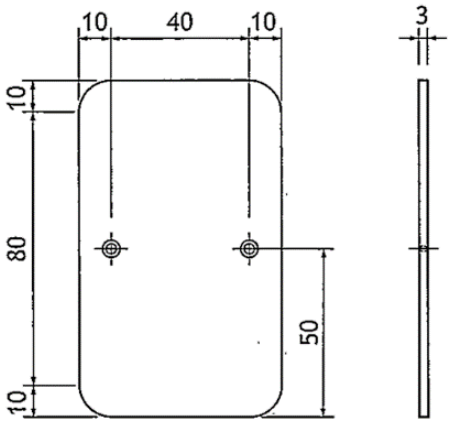
(ii) Explain what Tool B is used for. 1

Snipping the heads off the Rivit.

2. **(continued)**

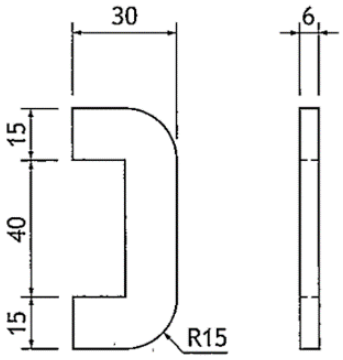
The working drawings for the door knocker are shown below.

Back plate



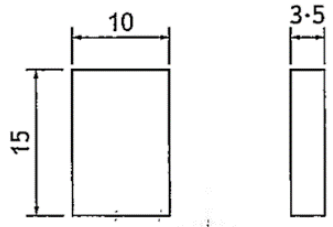
Elevation End Elevation

Grip



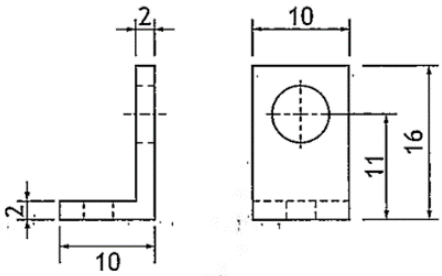
Elevation End Elevation

Knocker plate



Elevation End Elevation

Support



Elevation End Elevation

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2. (continued)

(e) Using the information from the drawings shown opposite, complete the cutting list shown below. 4

Part	Number	Material	Length	Breadth	Thickness
Back plate	1	Mild steel	100	60	3
Grip	1	Mild steel	70	30	6
Support	1	Mild steel	26	10	2
Knocker plate	1	Mild steel	15	10	3·5

[Turn over

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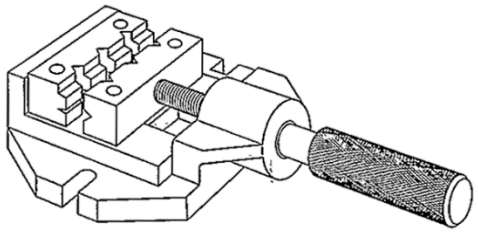
2. (continued)

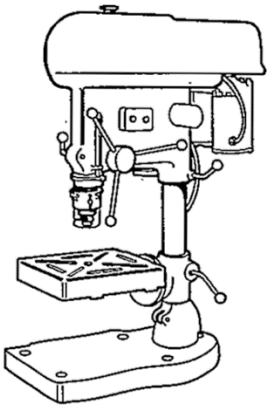
The tool, shown below, was used in the manufacture of the door knocker.



(f) Name this tool. 1

machine vice

The machine, shown below, was used in the manufacture of the door knocker.



(g) Name this machine. 1

Pillar Drill

(h) Explain why work areas and floors around machinery should always be kept clean and dry. 1

So its not slippery and hurts someone.

& must to clean because there could be ~~fall~~ shape objects on the floor.

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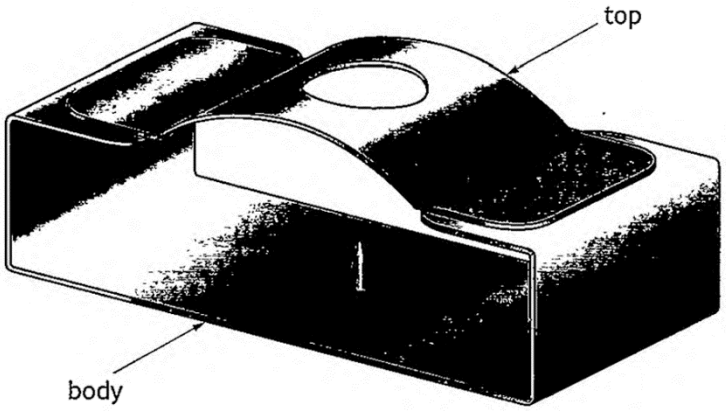
3. A candle holder is shown below.



The candle holder was made from recycled metal.

(a) (i) State why it is important to use recycled metal whenever possible. Give two reasons. 2

Reason 1 Saves money

Reason 2 Helps the envirment would be no waste.

(ii) Describe a test that would distinguish between mild steel and aluminium as part of the recycling process. 1

They're magnetic.

[Turn over

MARKS | DO NOT WRITE IN THIS MARGIN

3. (continued)

The body, shown below, was made from 1mm mild steel sheet.

(b) Name a hand tool that can be used to remove the waste material before finishing with a file. 1

Junior Hack Saw.

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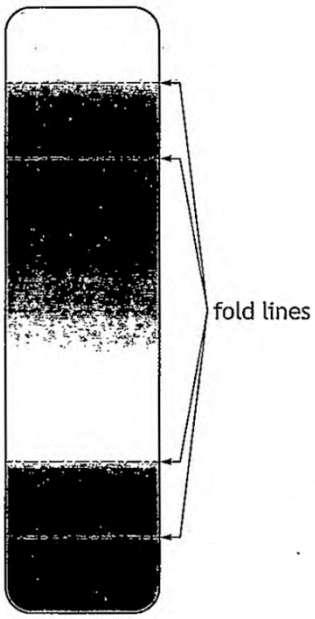
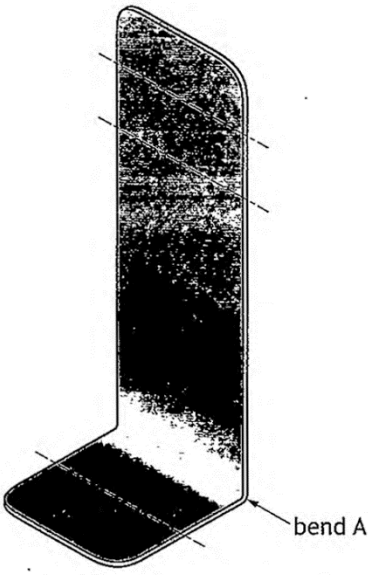
3. (continued)

The surface development and stage one of bending the body are shown below.

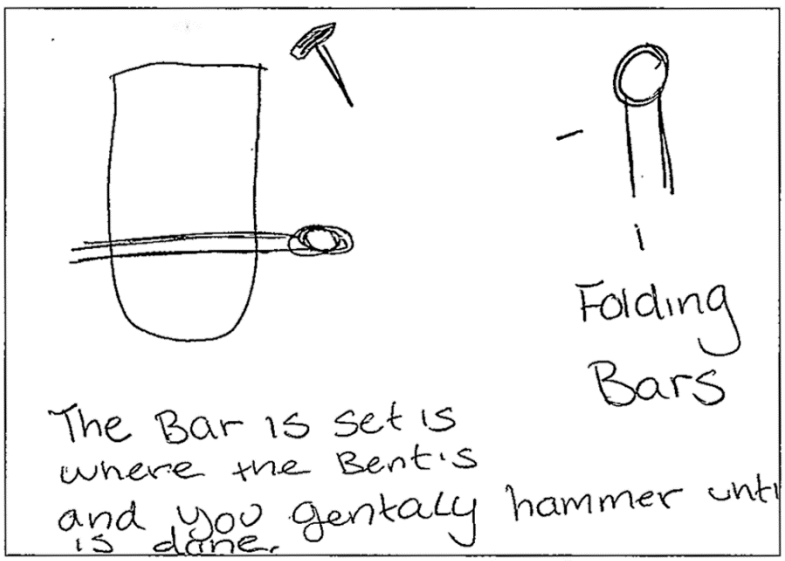


surface development



stage one of bending

(c) Describe, using correct terminology, how bend A is formed. 2
You may use sketches to support your answer.



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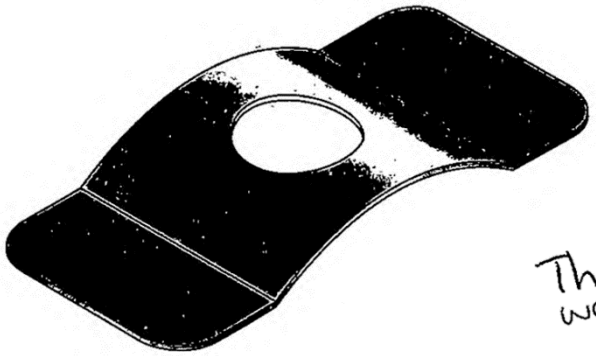
3. **(continued)**

The top of the candle holder is shown below.



(d) Explain why the hole is drilled in the top before bending it to shape. 1

Because if you Drilled after Bending it would Bent into the wrong shape.

The Drill would put it out of place

It was decided to make a pair of candle holders.

(e) State a method of ensuring that both tops are bent to the same shape. 1

Template.

(f) State one health and safety precaution that should be taken when working with sheet metal. 1

Gloves on so hands Don't get cut

~~Safety glasses keeping protect eyes~~

Safely glasses to protect eyes

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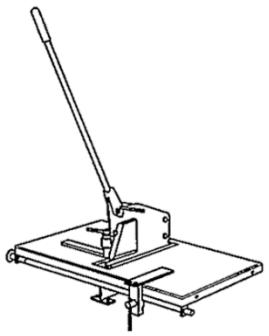
3. **(continued)**

The tool shown below is used when working with sheet metal.



(g) Name this tool. 1

Gillaten.

(h) Describe two stages of preparing sheet metal for a finish. 2

1 filing it smooth

* measuring.

2 ~~*~~ Dip coating it

* polishing it up

(i) State a suitable finish which could be applied to sheet metal. 1

Dip Coating

(j) Explain why blunt tools can be just as hazardous as sharp tools. 1

Blunt tool can still be sharp.

* they can still hurt someome

* could splinter.

[END OF QUESTION PAPER]