EXAMINATIONS COUNCIL OF ESWATINI
Eswatini Prevocational Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

TECHNICAL STUDIES **5925/02**

Paper 2 Theory **October/November 2024**

2 hours

Additional Materials: Standard Drawing Equipment **Total Marks: 100**

READ THESE INSTRUCTIONS FIRST

Write your name, centre number and candidate number in the spaces provided.
Write in **dark blue** or **black** pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, glue or correction fluid.

Answer **all** questions.

You may use an electronic calculator.

All dimensions in millimetres unless otherwise stated.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
Section A	
Section B	
Total	

This document consists of **22** printed pages and **2** blank pages.

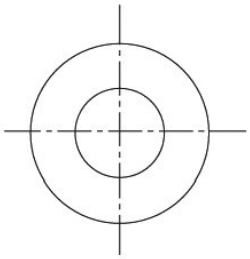
For Examiner's Use

SECTION A

Answer all **six** questions in this section in the spaces provided. Each question carries **five** marks.

1 **(a)** An incomplete first angle projection symbol is shown below.

Complete the symbol.



[1]

(b) **Fig. 1** shows a line diagram of a sign post.

By means of geometrical constructions, draw a:

(i) circle to pass through points **A**, **B** and **C** of the sign post. [2]

(ii) tangent from point **D** to meet the circle at **E**. Show point **E**. [2]

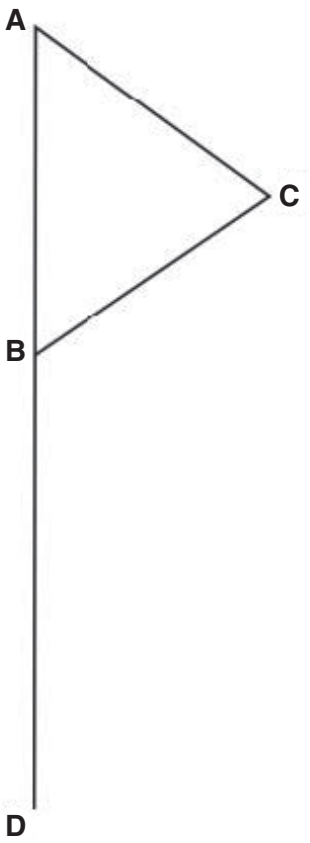
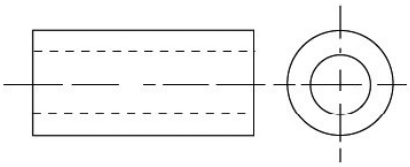
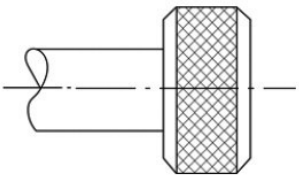
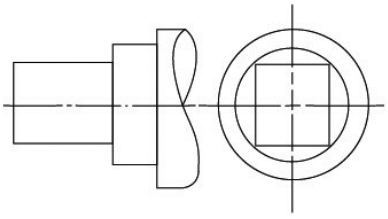


Fig. 1

2 Complete Table 1 by drawing the conventional symbol used to represent each of the features shown. [5]

Table 1

Feature	Conventional symbol
 long tube	
 long solid bar	
 long piece of wood	
 diamond knurling	
 square on shaft	

3 Fig. 2 shows the front view of a truncated square duct.

Draw the plan and the development (net) of the duct. [5]

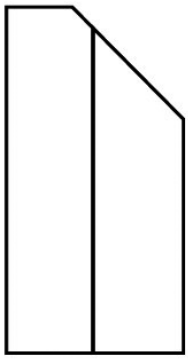


Fig. 2

4 Fig. 3 shows three views of a shaped block in orthographic projection.

Draw a full size isometric view of the shaped block. Corner **X** has been given. [5]

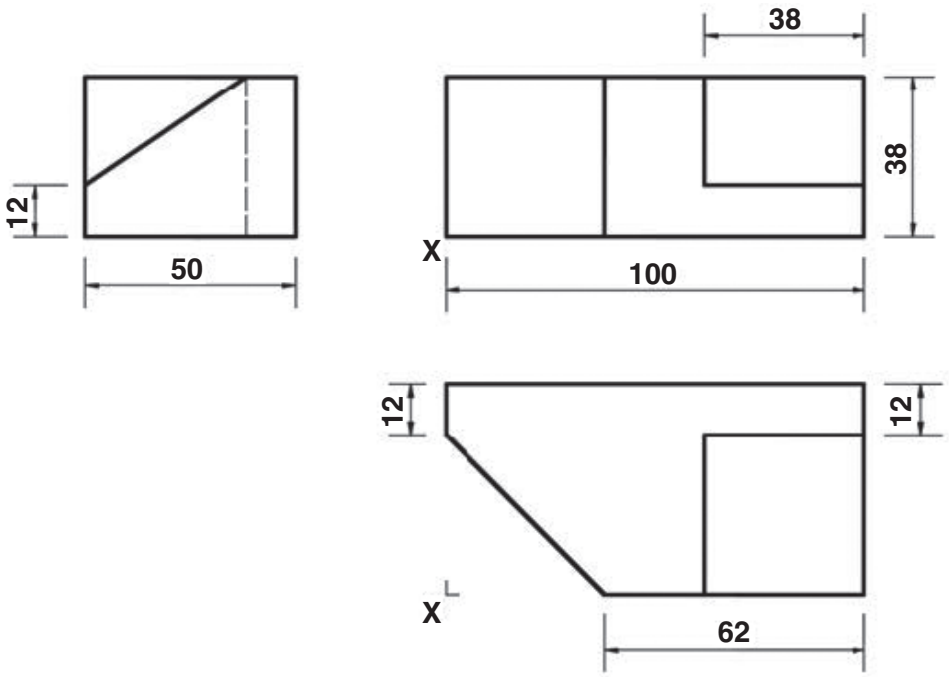


Fig. 3

X

5 Fig. 4 shows two views of a cylinder. Draw the true shape of section taken from **Y–Y**. [5]

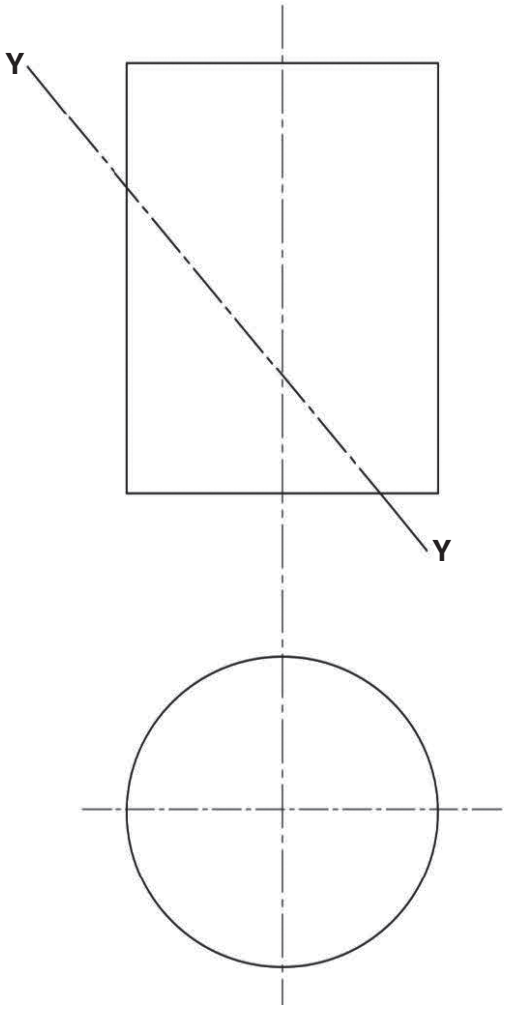


Fig. 4

6 Fig. 5 shows a slide support in first angle projection. Project a sectional elevation taken from **S–S**. [5]

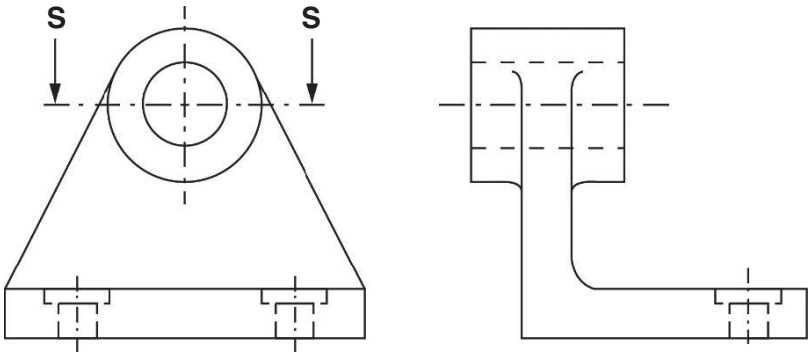


Fig. 5

[Turn over

SECTION B

Answer all **seven** questions in this section in the spaces provided. Each question carries **ten** marks.

1 **(a)** Fig. 6 shows a marking gauge.

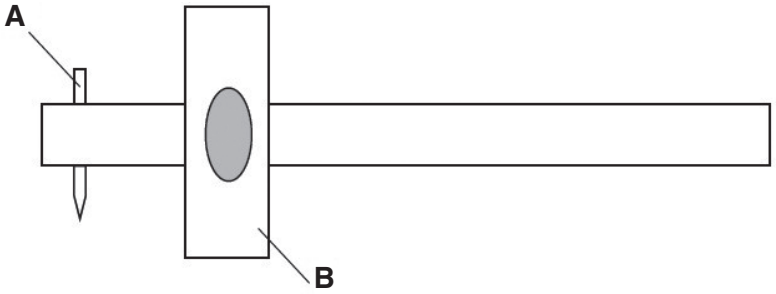


Fig. 6

Name the parts labelled **A** and **B**.

A ..... [1]

B ..... [1]

(b) State **two** things to be considered when inserting a coping saw blade.

1 ..... [1]

2 ..... [1]

(c) Name the hammer shown in Fig. 7.

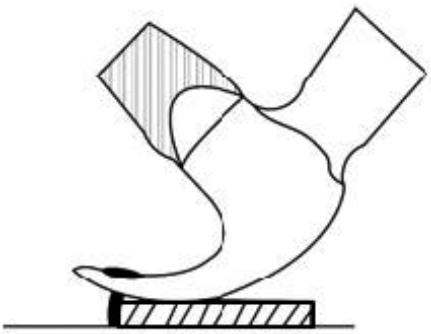


Fig. 7

..... [1]

(d) Fig. 8 below shows a cross section of two hardwood pieces to be joined by means of a screw.

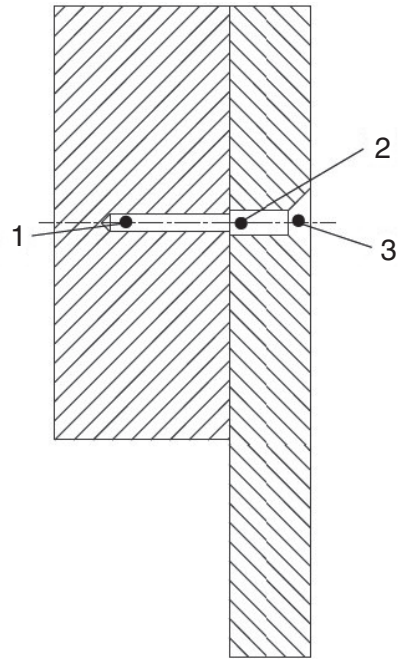


Fig. 8

Label the holes 1, 2 and 3.

1 ..... [1]

2 ..... [1]

3 ..... [1]

(e) Fig. 9 shows a G cramp holding a piece of wood on a workbench in readiness to cut out the shoulder.

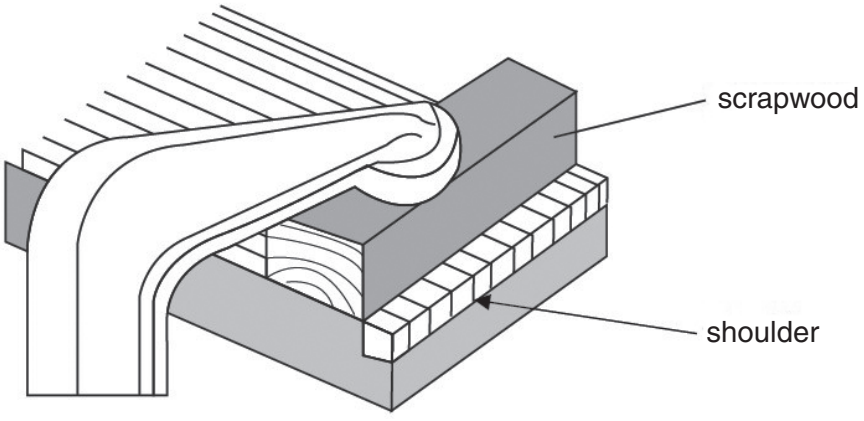


Fig. 9

Give **two** functions of the scrapwood.

1 ..... [1]

2 ..... [1]

[Turn over

2 **(a)** Fig. 10 shows a garden shed door. The door has a structural weakness and needs to be modified to overcome this weakness.

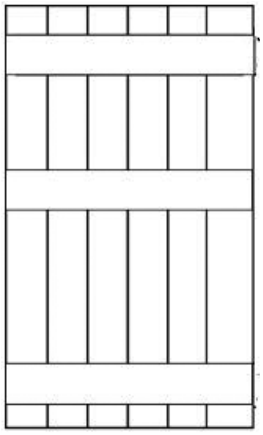


Fig. 10

(i) Name the type of door shown in Fig. 10?

..... [1]

(ii) Modify the drawing of the door shown in Fig. 10 to ensure it has greater structural strength. [2]

(iii) Explain what could happen to the garden shed door, over a period of time, if the modification is not carried out.

.....

..... [2]

(iv) Name a suitable hinge that could be used for hanging the garden shed door.

..... [1]

(b) Fig. 11 shows exploded views of a trolley used to move a stack of chairs.

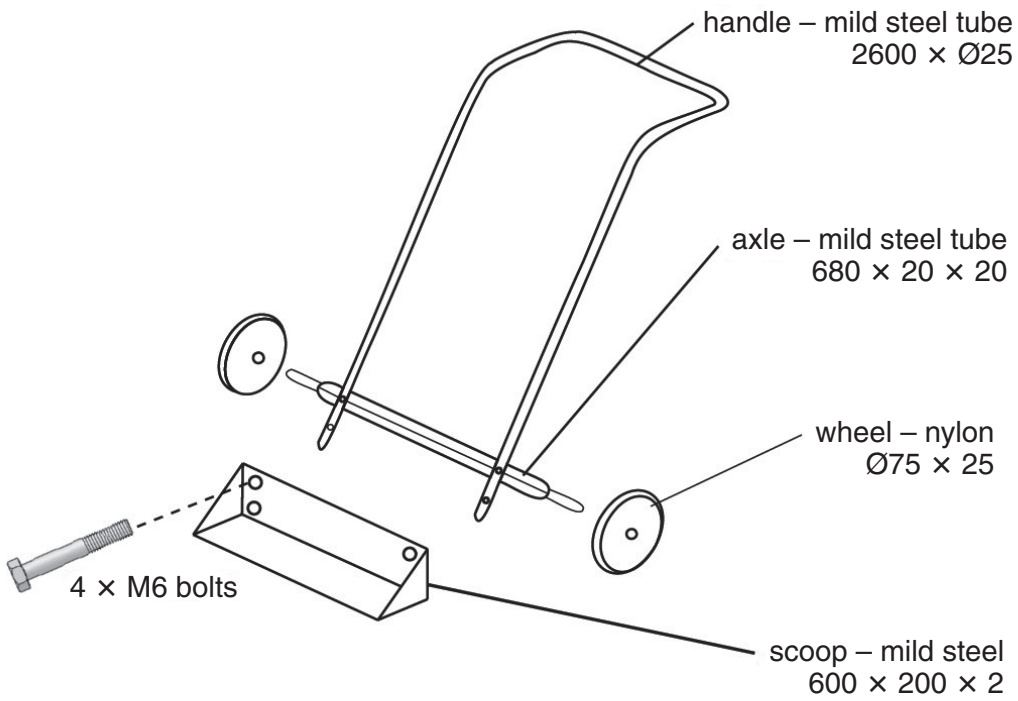


Fig. 11

Complete the cutting list below using the information in Fig. 11

Part	No Off	Length	Width	Thickness	Material
handle	1	**(i)** ……	Ø25		mild steel tube
(ii) ……	1	680	20	20	mild steel tube
scoop	1	600	200	**(iii)** ……	mild steel
wheels	2		Ø75	25	**(iv)** ……

[4]

3 **(a)** Adhesives are widely used to join metal, plastics and woods.

(i) Complete Table 1 by naming a suitable adhesive for the given situation. [3]

Table 1

Situation	Suitable adhesive
metal to metal	
plastic to wood	
wood to wood	

(ii) Give details of how to prepare the wood surface for wood to wood gluing.

.....

..... [1]

(iii) Give details of how to apply the adhesive to the wood surface for wood to wood gluing.

.....

..... [1]

(iv) Give **one** possible safety consideration when gluing.

.....

..... [1]

(b) Fig. 12 shows a piece of mild steel sheet with the centres for two holes marked out.

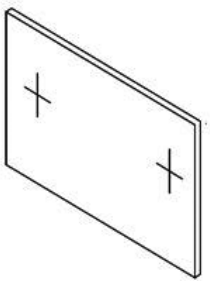


Fig. 12

Complete the table below by naming one tool that could be used for each process.

Stage	Process	Tool
(i)	Marking out the centres lines	
(ii)	Drilling the holes	
(iii)	Making edges flat	
(iv)	Testing edges for flatness	

[4]

4 (a) (i) Fig. 13 shows a sheet metal bracket to be fastened to a piece of wood by means of screws.

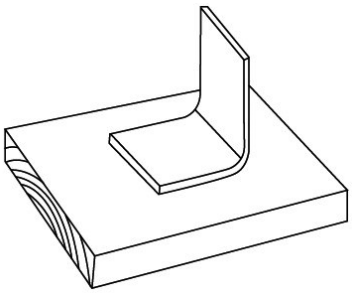


Fig. 13

Name the most appropriate type of screw that could be used to fasten the sheet metal bracket to the piece of wood shown in Fig. 13.

..... [1]

(ii) Fig. 14 shows two pieces of wood to be joined using screws.

Screws will not hold firmly along the grain unless a special method is used.

By means of sketches show how this method could be achieved.

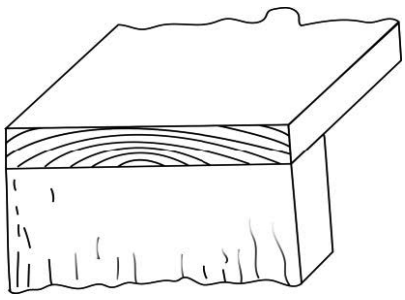


Fig. 14

[2]

(iii) State **two** things that one must mention when buying screws.

1 .....

2 ..... [2]

(b) Fig. 15 shows a frame made out of solid wood.

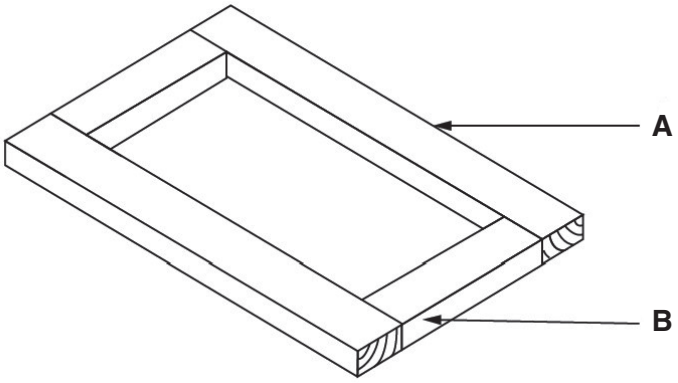


Fig. 15

(i) Name part **A** and **B**.

A ..... [1]

B ..... [1]

(ii) State **two** ways the frame in Fig. 15 could be tested for squareness.

1 ..... [1]

2 ..... [1]

(iii) Name a joint that could be used to join part **A** to part **B** of the frame.

..... [1]

[Turn over

5 **(a)** Fig. 16 shows two pieces of wood glued and nailed together.

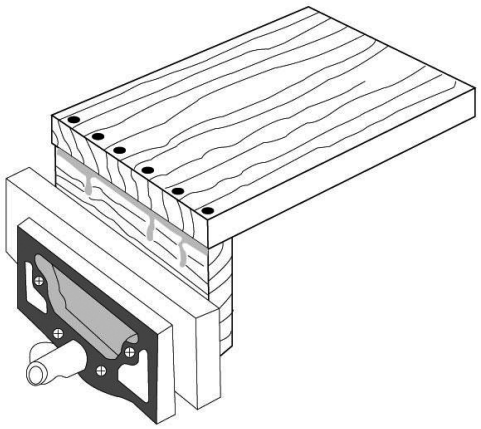


Fig. 16

(i) Name the method of nailing that is best suited for this kind of joint.

..... [1]

(ii) By means of a sketch show the method of nailing named in **(i)**.

[2]

(b) (i) Fig. 17 shows a leg, rail and a top of a table made out of solid timber.

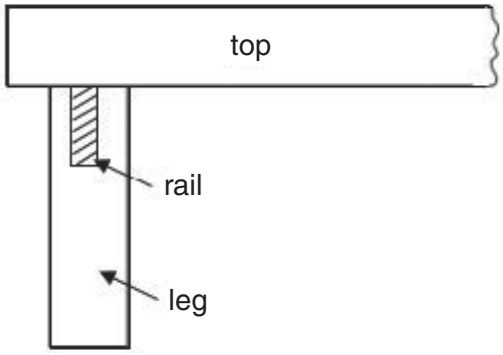


Fig. 17

In the space below, show how the rail could be fixed to the top.

[2]

(ii) Give **two** advantages of manufactured boards over solid timber.

1 .....

2 ..... [2]

(iii) Fig. 18 shows an exploded view of a sheet of plywood with three layers.

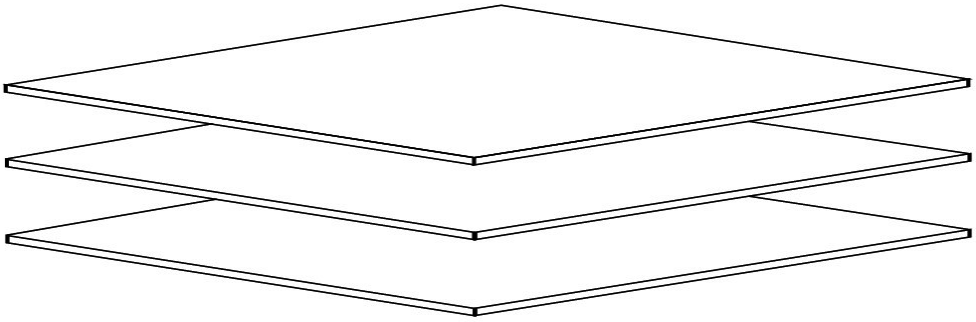


Fig. 18

Draw the grain directions on each of the layers (plies) to show how a sheet of plywood is made. [3]

6 **(a)** Fig. 19 shows a spice rack made from acrylic.

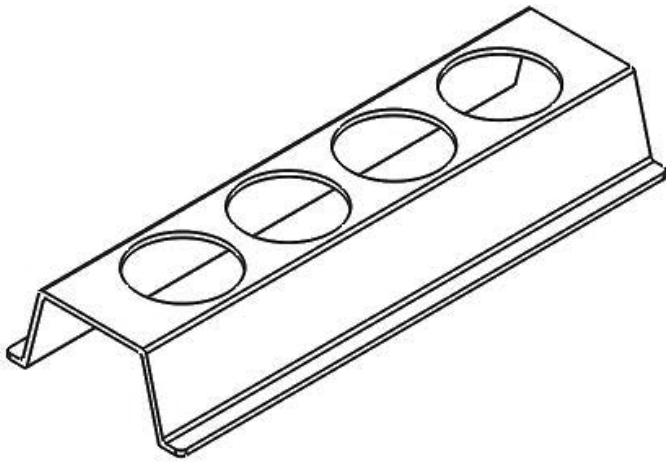


Fig. 19

(i) State **two** reasons why one would decide to make the rack from acrylic rather than solid timber.

1 ..... [1]

2 ..... [1]

(ii) State why acrylic is covered with plastic or paper when purchased.

..... [1]

(iii) Use sketches and notes to describe how the edges of the spice rack would be finished.

[3]

(b) Fig. 20 shows a bracket that is used to hold a net to a table tennis table.

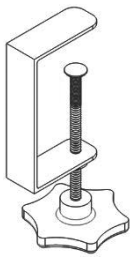


Fig. 20

(i) Name a ferrous metal that could be used for the bracket.

..... [1]

(ii) Give a reason, other than strength why a ferrous metal would be suitable to make the bracket.

..... [1]

(iii) Give **two** reasons why it would be wise to drill the material for the bracket before shaping it.

1 ..... [1]

2 ..... [1]

7 **(a)** Fig. 21 shows a garden tool holder made from a mild steel sheet.

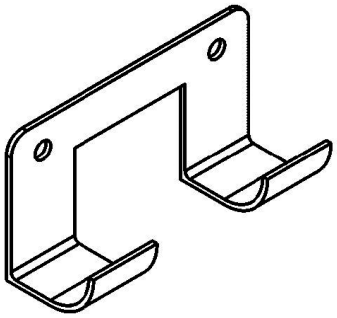


Fig. 21

(i) State **two** important aspects to consider when designing the garden tool holder.

1 ..... [1]

2 ..... [1]

(ii) Explain how to mark out the centre of the holes so that the drill will not slip.

..... [1]

(iii) State **one** safety precaution that must be observed when drilling the mild steel sheet.

..... [1]

(iv) Give **two** reasons why the garden tool holder should be painted.

1 ..... [1]

2 ..... [1]

(v) Describe how to prepare the surface of the garden tool holder for painting.

.....

.....

..... [2]

[Turn over

(b) Fig. 22 show an incomplete drawing of an odd-leg calliper and a piece of metal.

Complete the drawing in Fig. 22 to show how the odd-leg calliper would be used to mark the line on the piece of metal. [2]

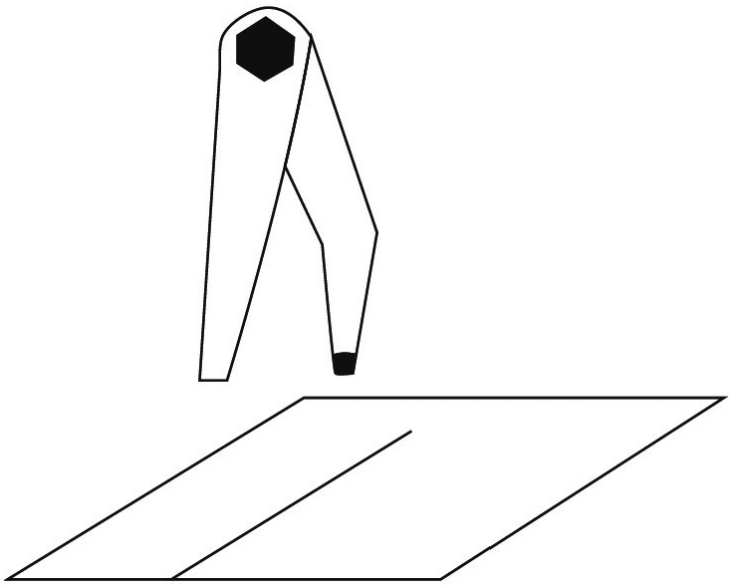


Fig. 22

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