



EXAMINATIONS COUNCIL OF ESWATINI

Junior Certificate Examination

CANDIDATE
NAME

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CENTRE
NUMBER

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NUMBER

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Design and Technology

537/01

Paper 1

October/November 2019

2 hours

Additional materials: Standard drawing equipment.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces provided at the top of the page.

Write in blue or black pen in the spaces provided on the question paper.

You may use a pencil/pen for any sketches, drawings or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

This paper consists of **two** (2) Sections; Section **A** and Section **B**.

Answer **all** questions in Section **A** and any **two** (2) questions in Section **B** in the spaces provided.

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	
Section B	
Total marks	

SECTION A [30 Marks]

Answer **all** questions in this section.

- 1** Figure 1 below shows a marking out of a wood joint.

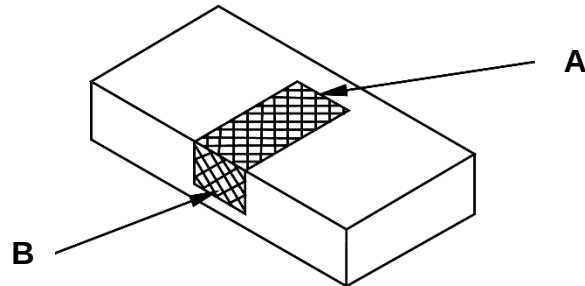


Fig. 1

- (a)** Name **one** tool that can be used to mark out line **A**.

..... [1]

- (b)** Name **one** tool that can be used to remove the waste to the line labelled **B**.

..... [1]

- 2** Figure 2 below shows a tool.

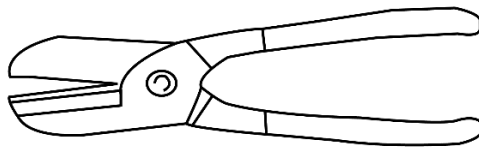


Fig. 2

- (a)** Name the tool.

..... [1]

- (b)** Describe the use of the tool.

..... [1]

3

- 3 Shown in Figure 3 below is an incomplete drawing of a shaving machine.

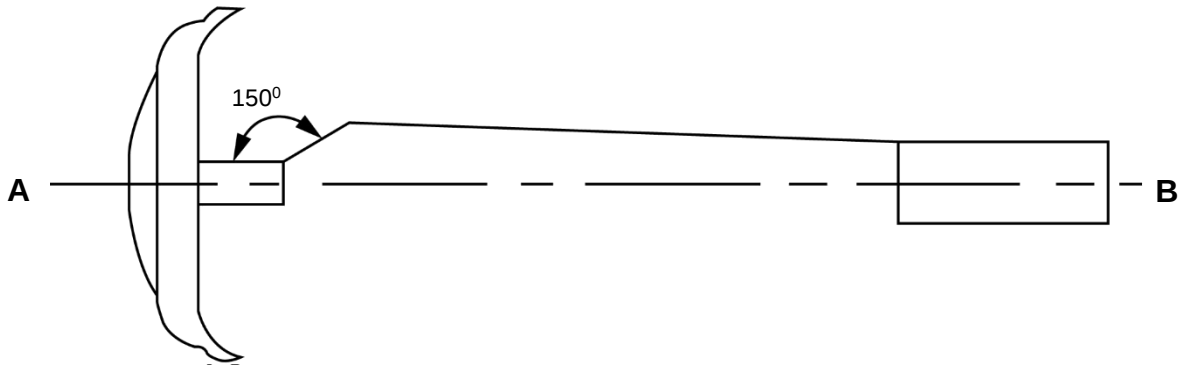


Fig. 3

Using geometrical construction complete the missing detail of the shaving machine given line **A-B** as a mirror line.

[4]

- 4 Shown in Figure 4 below is a drawing of a block of a manufactured board.

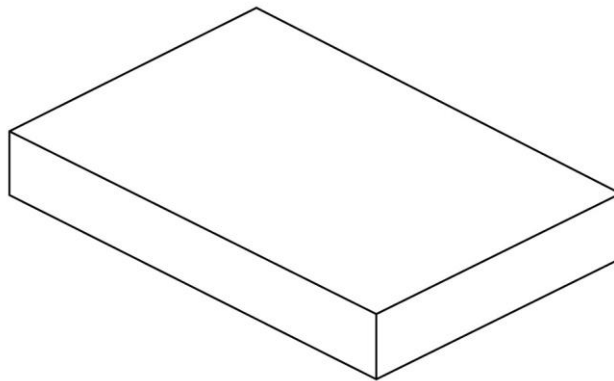


Fig. 4

On the drawing sketch to show that the board is a simple plywood.

[3]

- 5 Explain why it is not appropriate to use a scribe when marking out a bend line on plastics.

.....

.....

[1]

4

- 6 Figure 6 below shows a drawing of two pieces of 6mm thick metal.

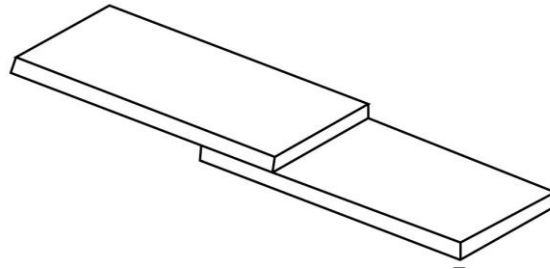


Fig. 6

Name **one** method that can be used to permanently join the pieces of metal without using heat.

..... [1]

- 7 Figure 7 (a) shows a pictorial view of a pipe that has been cut. Figure 7 (b) shows the sectional front view of the pipe.

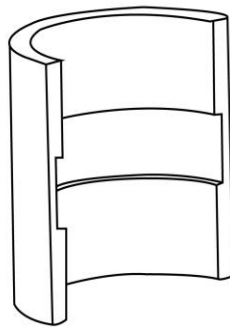


Fig. 7(a)

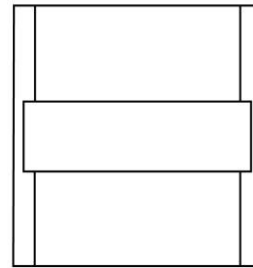


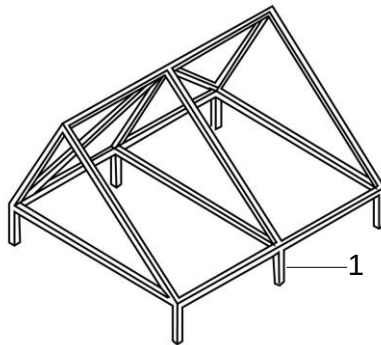
Fig. 7(b)

Using freehand, show on **Figure 7 (b)** that the pipe has been sectioned.

[2]

5

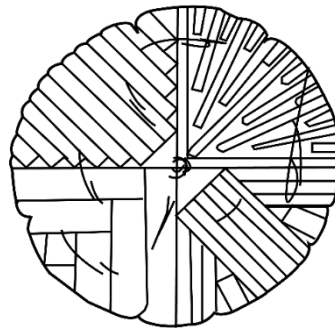
- 8 Shown below is a drawing of a roof truss.



Name the type of member labelled 1 on the diagram.

..... [1]

- 9 A method of converting timber is shown below.



- (a) Name the method of timber conversion.

..... [1]

- (b) What is the advantage of this method of timber conversion?

..... [1]

- 10 Figure 8 below shows a filing method.

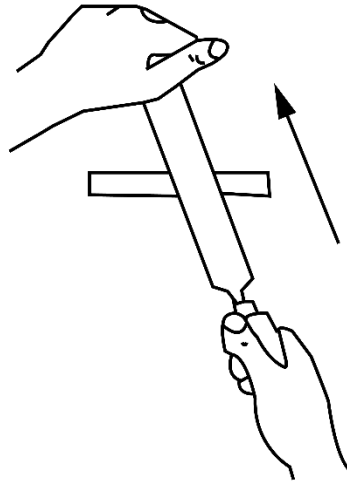


Fig. 8

Name the method of filing.

.....

[1]

- 11 Shown in Figure 9 below is a drawing of an engineer's vice.

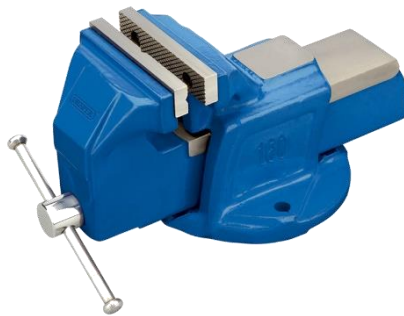


Fig. 9

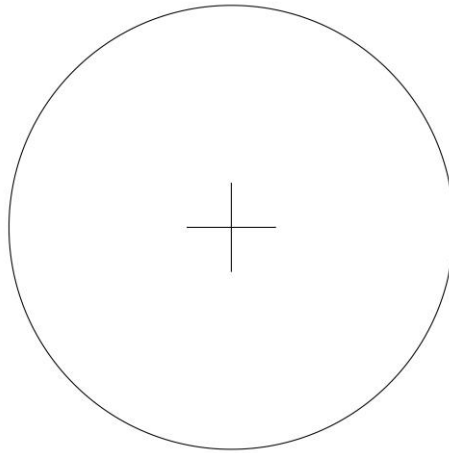
Explain how a plastic work piece could be protected from being damaged by the rough jaws of the vice.

.....

.....

[1]

- 12 A drawing of a circle is given below.



On the given circle draw and label the following parts a **quadrant** and a **chord**.

[2]

- 13 Figure 10 below shows a drawing of a hand drill.

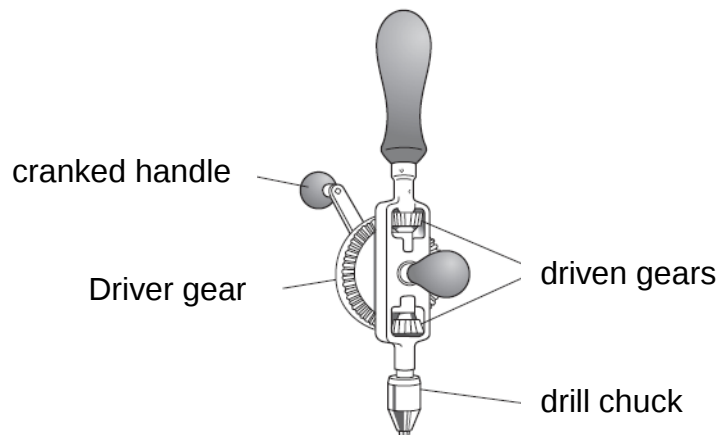


Fig. 10

- (a) Name the type of gears used to create rotary motion within the hand drill.

.....

[1]

- (b) Explain why the driven gears are made smaller than the driver gear.

.....

[1]

- 14 Figure 11 below shows an incomplete drawing of a piece of wood that is to be joined to another by means of a screw.

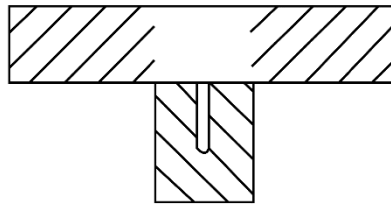


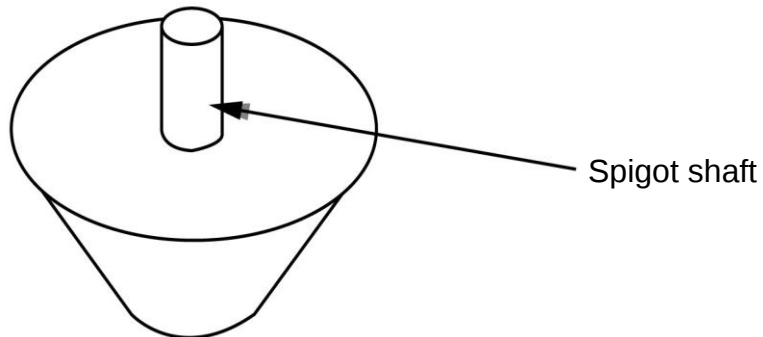
Fig. 11

- (a) Complete the drawing by showing a clearance hole and a countersunk hole. [2]

- (b) Name **one** tool that can be used to make the countersunk hole.

..... [1]

- 15 The drawing below shows a cabinet support made from a piece of metal.



Name **one** tool that can be used to **cut** threads on the spigot shaft.

..... [1]

- 16 Figure 12 below, shows a plastic toilet roll holder.

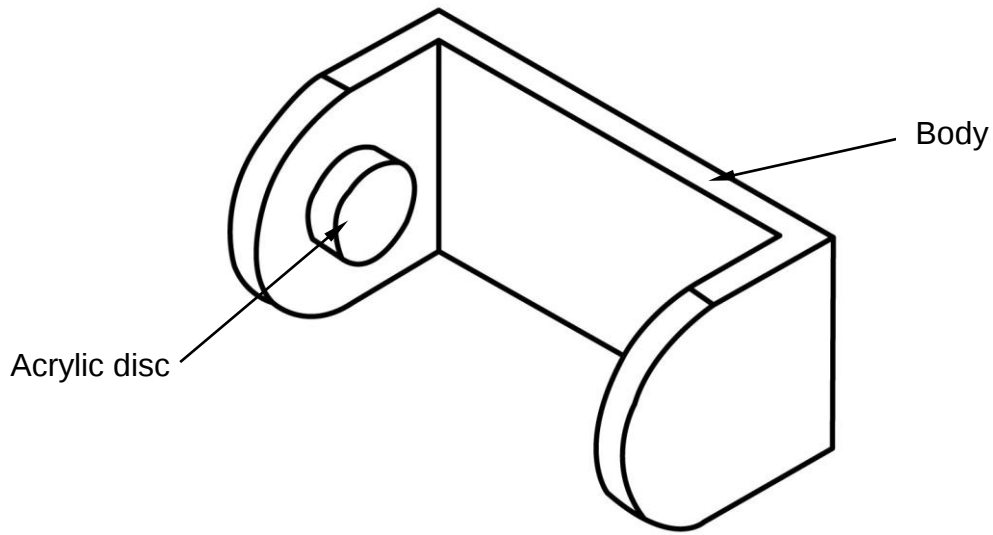


Fig. 12

- (a) Name **one** piece of equipment that can be used to soften the plastic before bending.

..... [1]

- (b) State **one** type of adhesive that can be used join the acrylic disc onto the body.

..... [1]

SECTION B [40 Marks]

Answer any **two** questions in this section.

Question B1

- 1** An unfolded geometrical solid is shown in Figure 1 below.

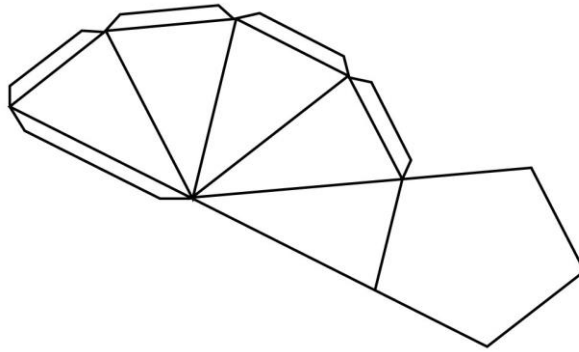
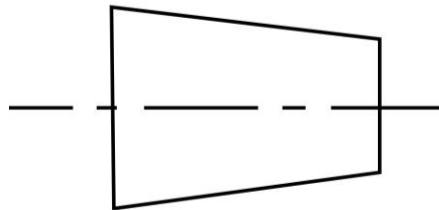


Fig. 1

Name the geometrical solid

..... [1]

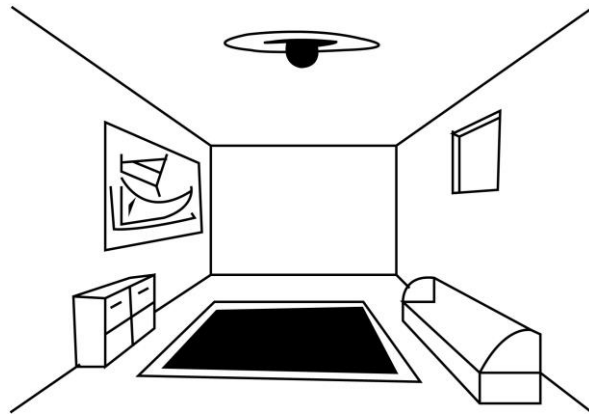
- 2** An incomplete 3rd Angle symbol of projection is shown below.



Complete the symbol of projection.

[1]

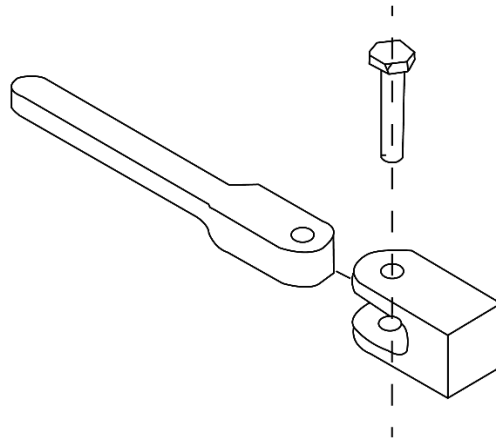
- 3 A drawing in pictorial view is shown below.



Name the **specific** type of projection that has been used to present the drawing.

..... [1]

- 4 Study the drawing carefully and complete the statement that follows.



An is very useful when a drawing has shown how different parts fit together.

[1]

- 5 Figure 2 below shows a drawing of a logo for a football club.

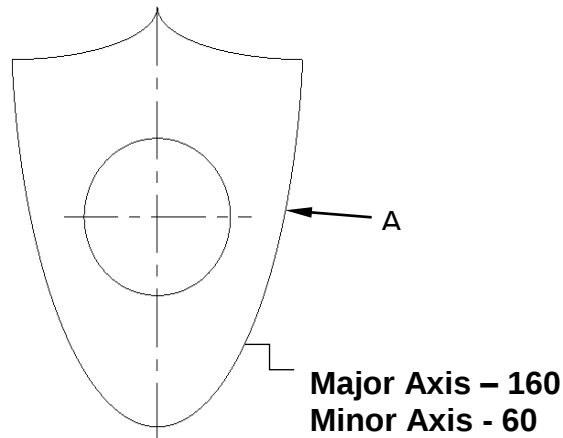


Fig. 2

Name the shape labelled **A**.

..... [1]

- 6 Figure 3 (a) shows a drawing of wall clock. Figure 3 (b) shows a drawing of the incomplete wall clock.

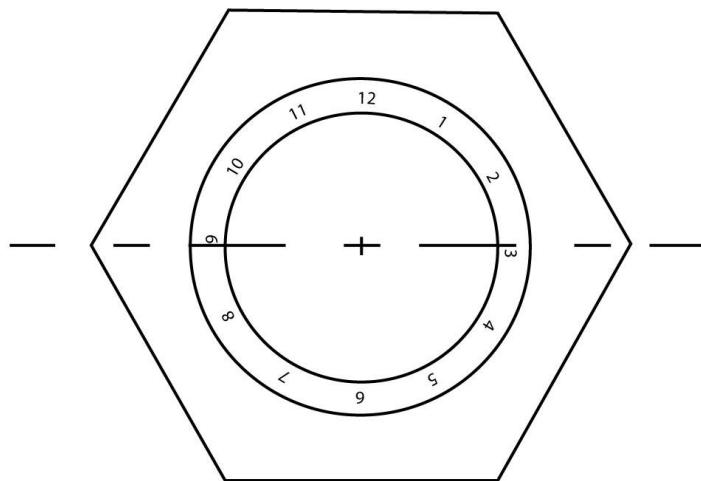
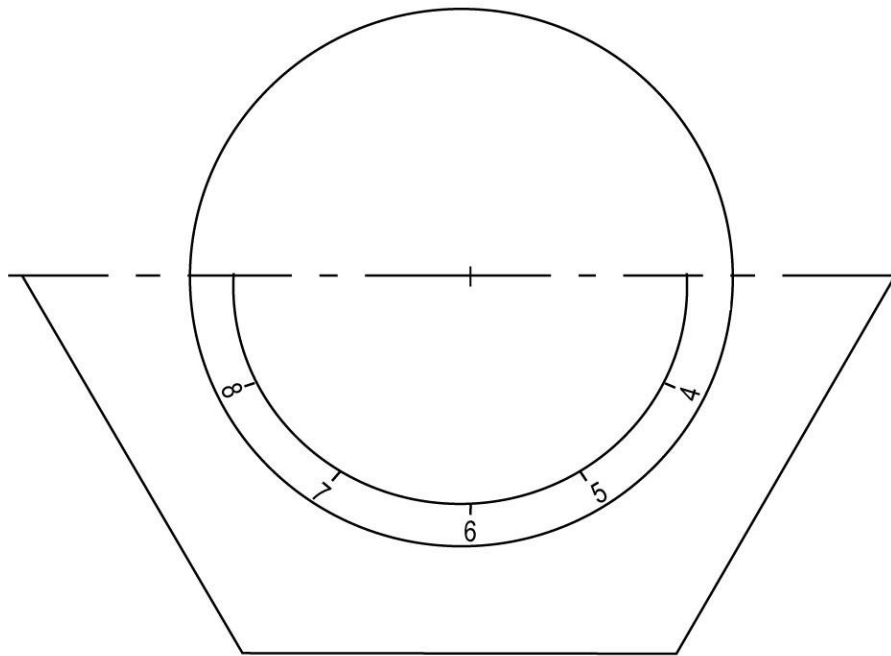


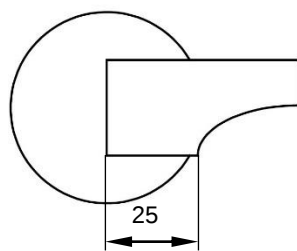
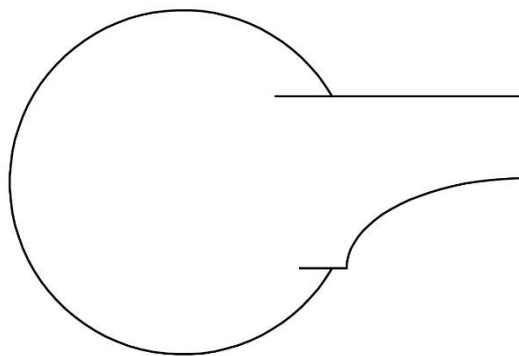
Fig. 3 (a)

**Fig. 3 (b)**

Using geometrical construction complete the missing details of the wall clock in Figure 3 (b).

[5]

- 7 Figure 5 (a) below shows a logo for a company selling keys. Figure 5 (b) shows an incomplete drawing of the logo.

**Fig. 5(a)****Fig. 5(b)**

Using geometrical construction complete the missing part of the logo, ensuring that all angles are right angles.

[4]

14

- 8 Figure 4 below shows a drawing of an incomplete trophy.



Fig. 4

Using geometrical construction, complete the missing detail of the right arm of the trophy.

[6]

Question B2

- 1** Fig. 1 shows a lunch box made from plastic.

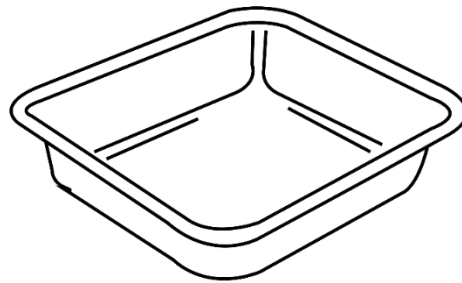


Fig. 1

- (a)** Name the process that has been used in shaping the plastic.

..... [1]

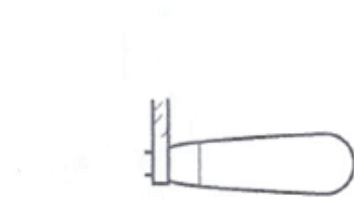
- (b)** Name one suitable plastic in which the food container could be made.

..... [1]

- (c)** In which class of plastics does the plastic named in (b) belong?

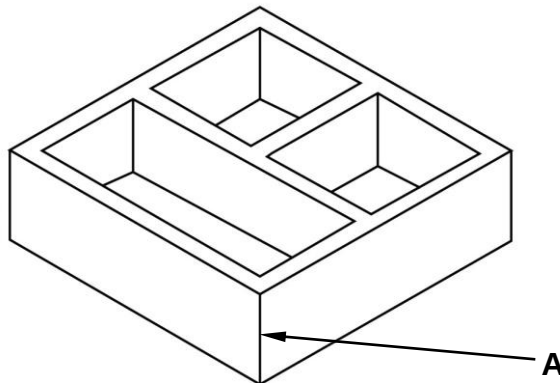
..... [1]

- 2 The drawing below shows an incomplete sketch of a coping saw.



Neatly draw the missing part of the sketch, clearly showing the direction of the teeth. [2]

- 3 Figure 2 below shows a drawing of a tool organiser made from solid timber.



- (a) Name **one** type of joint that can be used in corner A.

..... [1]

- (b) In the space provided below sketch the joint named in (a).

[3]

- (c) Name a specific type of manufactured board that can be used as a base to prevent the tools from falling off.

..... [1]

- (d) State **two** methods of fixing the base to the organiser.

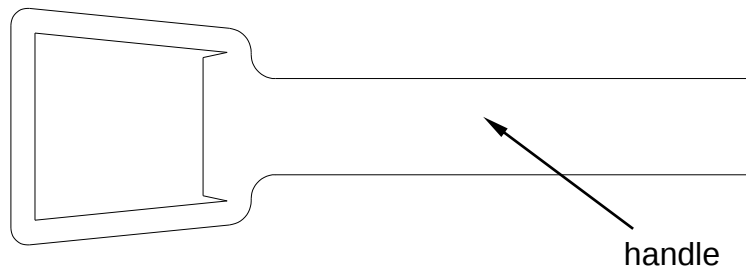
..... [1]

..... [1]

- (e) In the space provided below sketch an appropriate handle and show how it can be attached to the organiser.

[3]

- 4 Shown below is a design of a bottle opener made of 2mm thick metal.



- (a) On the space given below show by means of a sketch an improvement of the handle making it comfortable and safe to the user.

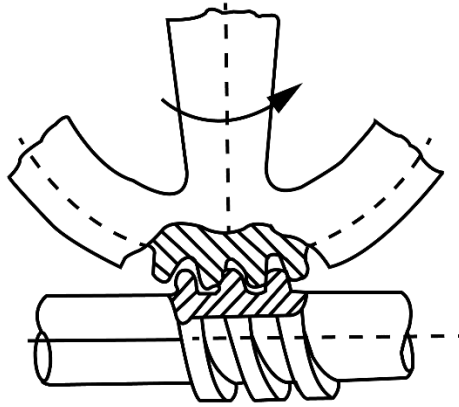
[4]

- (b) Name **one** type of metal that is suitable for making the bottle opener.

..... [1]

Question B3

- 1 A mechanism for creating motion is shown below.



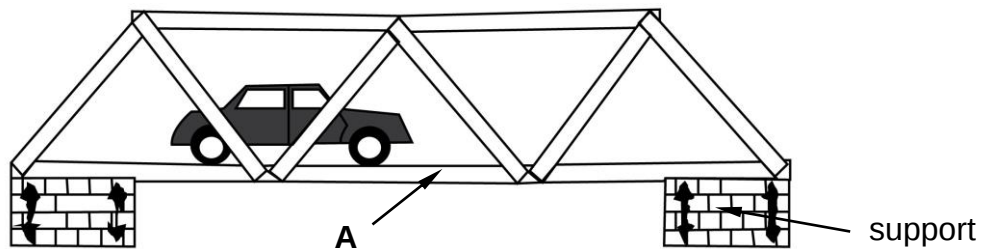
Give the appropriate name of the mechanism.

..... [1]

- 2 Define the term reciprocation.

..... [1]

- 3 Shown below is part of a man-made frame structure.



- (a) Name the part of the structure labelled **A**

..... [1]

- (b) What type of force is exerted by the car on part **A**?

..... [1]

- (c) Name the method used to strengthen the structure.

..... [1]

- (d) What type of force is exerted by the structure on the support?

..... [1]

- 4 Figure 1 below shows a drawing of a hammer being used to pull out a nail.

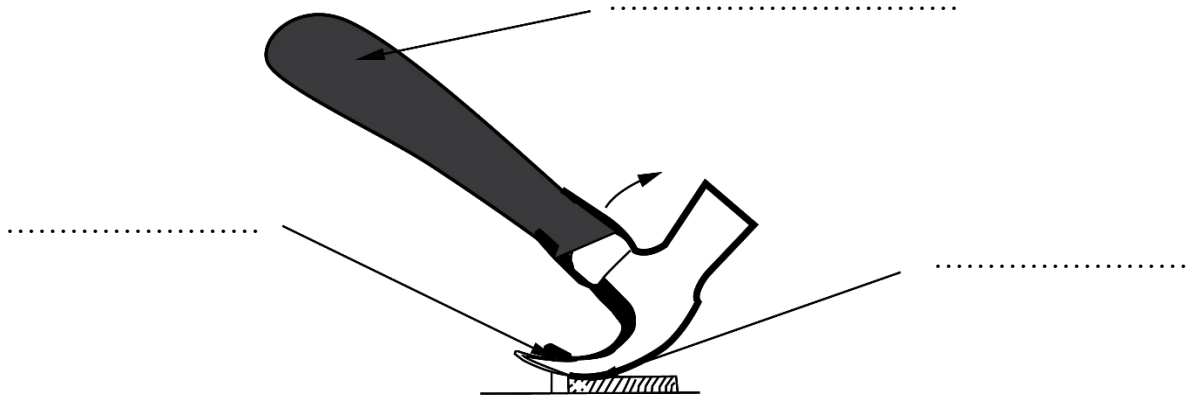


Fig. 1

- (a) On the diagram label the fulcrum, load and effort. [3]
- (b) Name the class of levers in which the hammer belongs. [1]
-

- 5 Figure 2 shows a front view of a bracket used to support a shelf in a Design and Technology storeroom for tools.

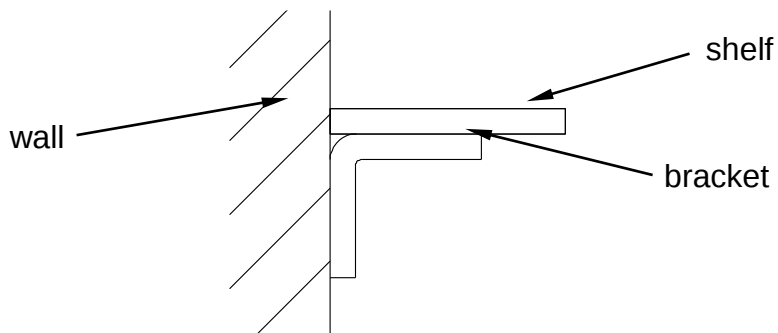


Fig. 2

- On the drawing add a way of strengthening the bracket to prevent failure. [1]

- 6 Figure 3 below shows a mechanism of a bicycle.

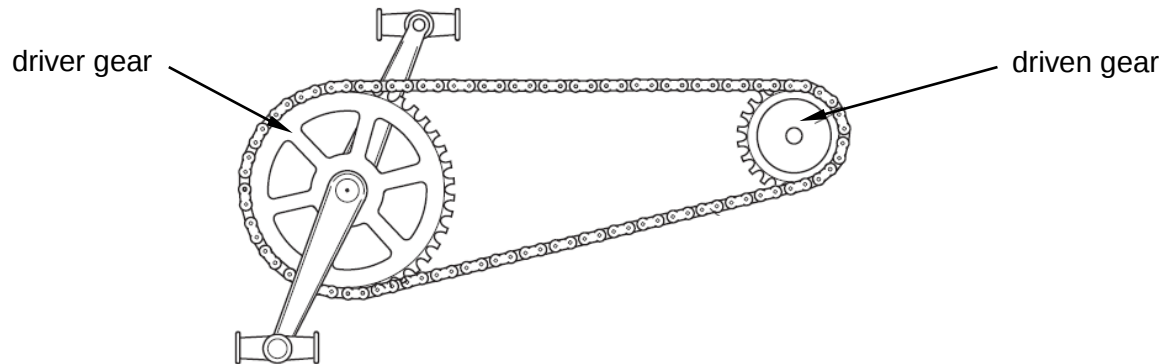


Fig. 3

- (a) State the correct name of the mechanism.

..... [1]

- (b) Explain why this mechanism is considered better than other mechanisms for this situation.

.....
..... [1]

- (c) What is the advantage of having the driver larger than the driven gear?

..... [1]

- 7 Figure 4 shows a drawing of a toilet lock used to secure a toilet door in position.

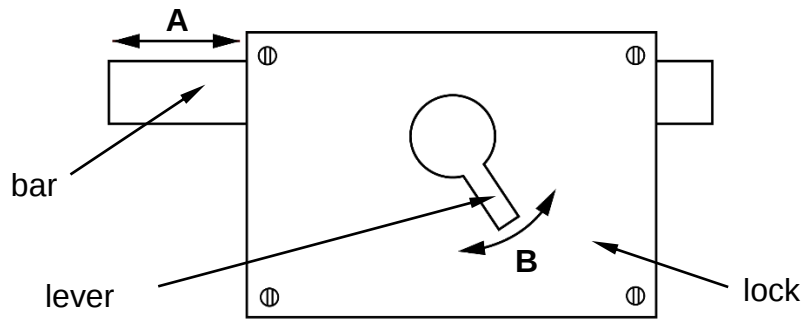


Fig. 4

- (a) Name **one** specific mechanism that can be fitted in the lock to enable the bar to move as indicated by arrow **A** when the lever is swung in the direction indicated by arrow **B**.

..... [1]

- (b) Name the motions as indicated by;

Arrow **A** [1]

- 8 Figure 5 shows an ironing board used in the consumer science department.

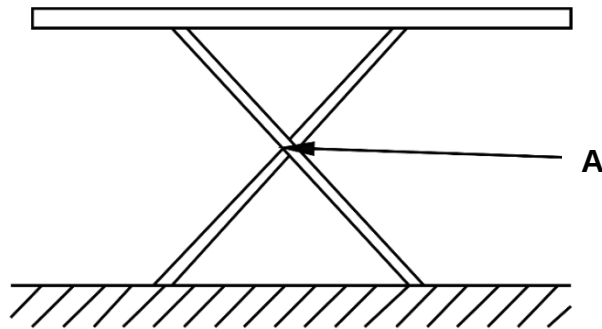


Fig. 5

- (a) On the sketch show how the ironing board can be adjusted to 3 different heights.

..... [1]

- (b) Name the joint indicated by arrow **A**.

..... [1]

- 9 Figure 6 shows a mechanism.

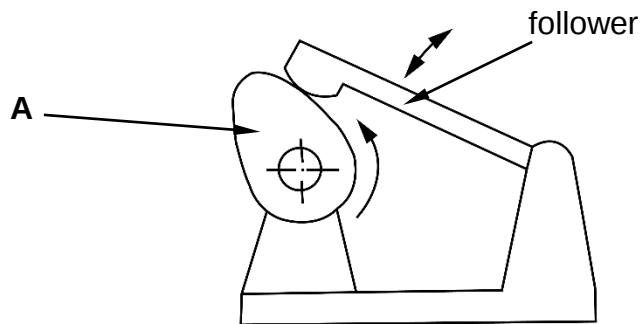


Fig. 6

- (a)** Name the part of the mechanism labelled **A**.

.....

[1]

- (b)** What is the motion experienced by the follower?

.....

[1]

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