

DESIGN AND TECHNOLOGY

9705/12

Paper 1

October/November 2019

3 hours

Additional Materials: Answer Booklet/A4 Paper
A3 Drawing Paper (2 sheets)
Extra sheets of A3 drawing paper for candidates who have used up both sides of their 2 sheets
A range of design drawing equipment

READ THESE INSTRUCTIONS FIRST

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.
Write your answers and working on the separate Answer Booklet/Paper provided.
Write your name, centre number and candidate number on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil, or coloured pencils/pens as appropriate, for any diagrams, graphs or rough working.
Do not use staples, paper clips, glue or correction fluid.
DO NOT WRITE IN ANY BARCODES.

Section A

Answer **one** question on the Answer Booklet/A4 Paper provided.

Section B

Answer **one** question on the Answer Booklet/A4 Paper provided.

Section C

Answer **one** question on plain A3 paper.
Use **both** sides of the paper.
You may request additional sheets of A3 paper, but only if you have used up both sides of each of the 2 sheets provided.

You are advised to spend **30 minutes** on each of Sections A and B and **2 hours** on Section C.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [] at the end of each question or part question.
All dimensions are in millimetres.

This document consists of **10** printed pages and **2** blank pages.

Section A

Answer **one** question from this section on the Answer Booklet/A4 paper provided.

- 1 Fig. 1.1 gives details about an aluminium sweet scoop that is to be made in a school workshop.

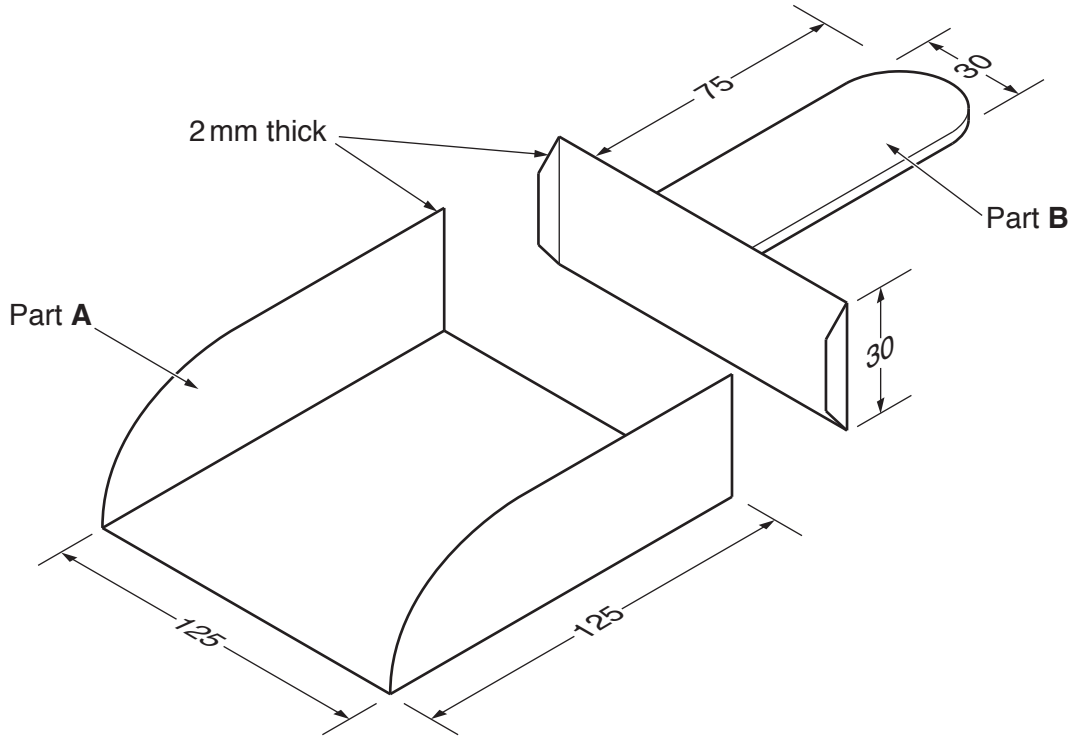


Fig. 1.1

- (a) State **two** methods that could be used to join Part A to Part B. [2]
- (b) Use notes and sketches to describe:
- (i) how Part A could be bent accurately [6]
 - (ii) how Part B could be cut out and the edges smoothed. [6]
- You must give details about the tools, equipment and processes involved and the safety precautions that have to be undertaken at each stage.
- (c) Use notes and sketches to show changes that could be made to the design of the sweet scoop to make it more comfortable to use. [6]

2 Fig. 2.1 shows a toy house that is made from card, which is to be produced in a school workshop.

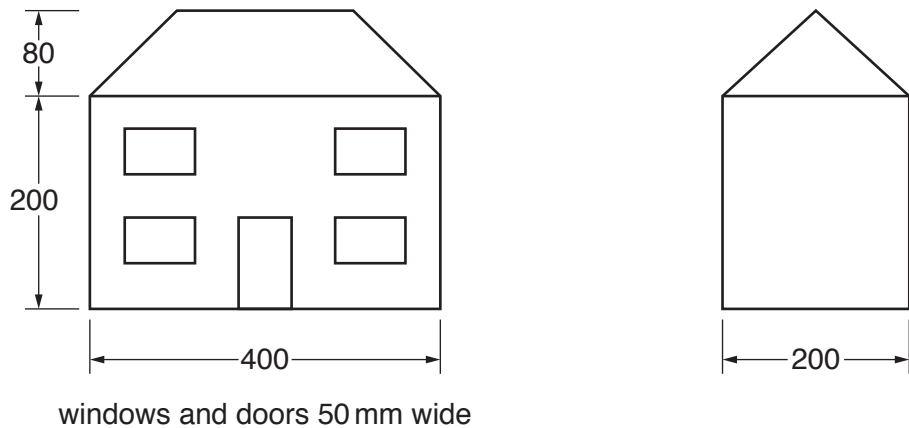


Fig. 2.1

(a) Name:

- (i) a suitable glue that could be used to join the pieces of card [1]
- (ii) a suitable lightweight sheet material (other than card) that could be used to make the door. [1]

(b) Sketch a pictorial (3D) view of the house to include detailing of window frames and door. [6]

(c) Use notes and sketches to describe:

- (i) how the one piece card development (net) required to make the roof could be marked out, cut out and attached to the house [6]
- (ii) how the one piece card development (net) required to make the house could be marked out, cut out and assembled. [6]

You must give details about the tools, equipment and processes involved and the safety precautions that have to be undertaken at each stage.

- 3 Fig. 3.1 gives details about a large protractor made from plywood, which is to be produced in a school workshop. The protractor is made in two parts.

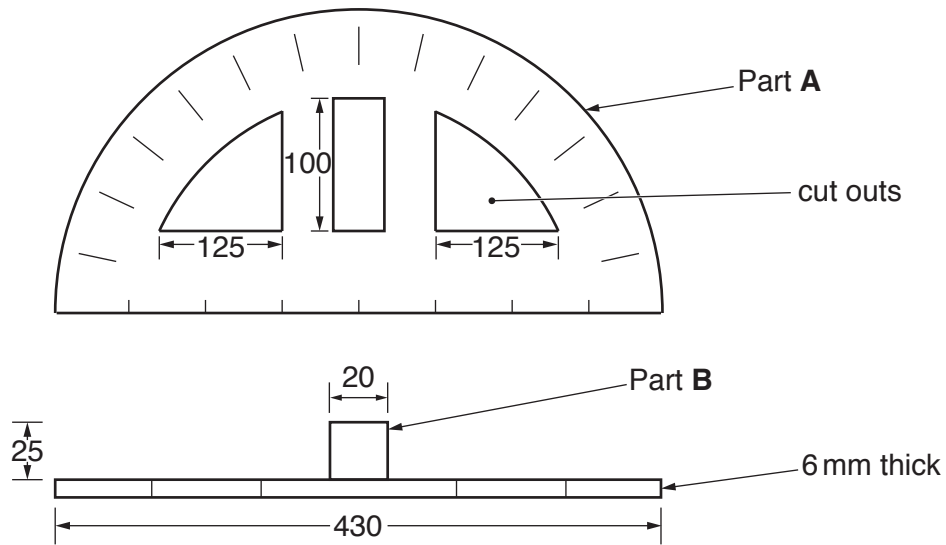


Fig. 3.1

- (a) Give **two** reasons why the large protractor will be made from plywood rather than a softwood. [2]
- (b) Use notes and sketches to describe:
- (i) how Part **A** could be made [6]
 - (ii) how Part **B** could be made and semi-permanently attached to Part **A**. [6]
- You must give details about the tools, equipment and processes involved and the safety precautions that have to be undertaken at each stage.
- (c) Use notes and sketches to show changes that could be made to the design to make the protractor more ergonomic to use. [6]

Section B

Answer **one** question from this section on the Answer Booklet/A4 paper provided.

- 4 Fig. 4.1 shows a free standing sign for an events management company. The sign allows the company to alter the direction and wording depending on the event.

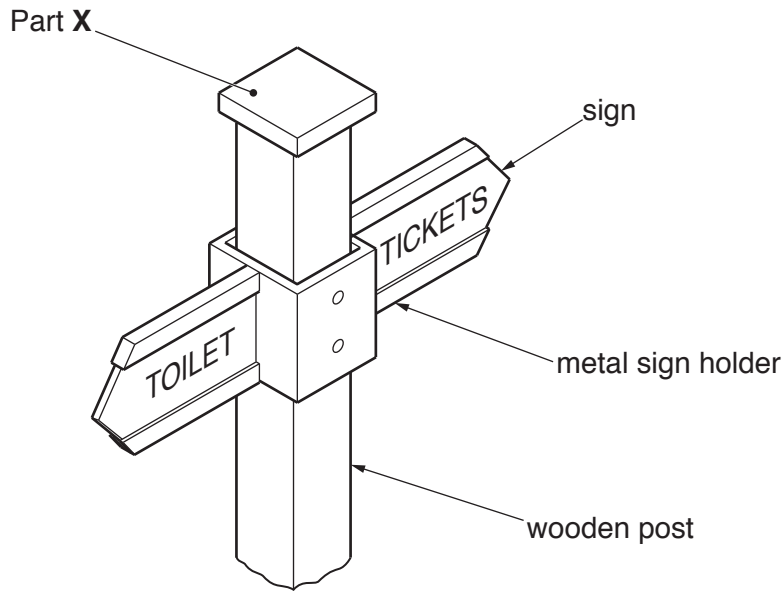


Fig. 4.1

- (a) Explain the function of Part X. [2]
- (b) Identify and describe **two** problems with the design of the adjustable sign. [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Surface finishes are often used during the manufacture of products made from metal. Discuss why they are needed.

Your answer should:

- (i) analyse the given situation and identify **three** relevant issues raised by the question [3]
- (ii) explain why you consider these issues to be relevant [3]
- (iii) contain specific examples/evidence to support your conclusions. [2]

- 5 Fig. 5.1 shows a vacuum forming mould used in the manufacture of the packaging of a product.

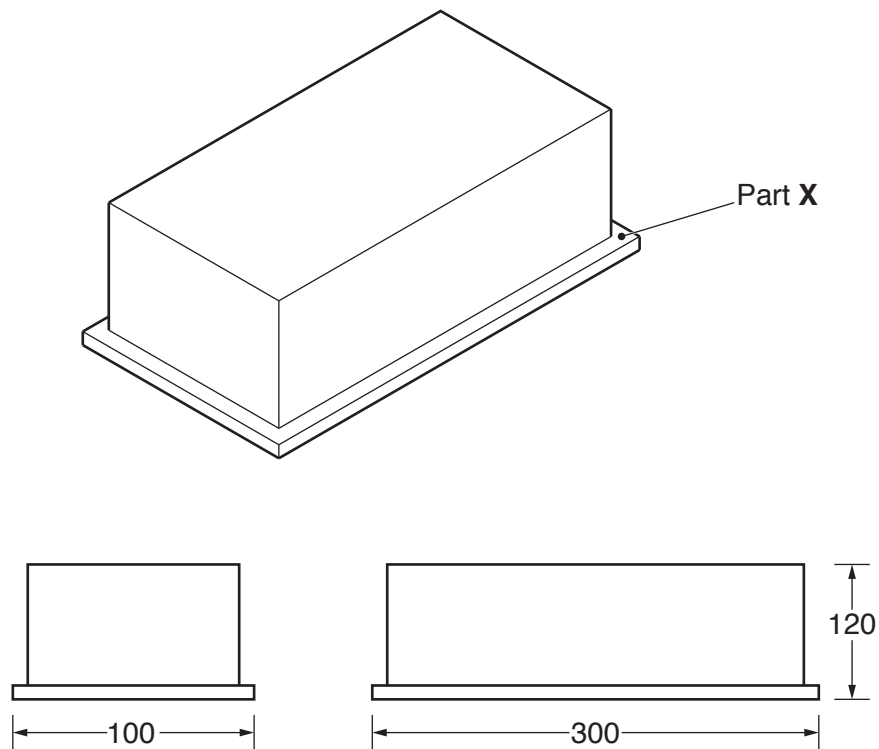


Fig. 5.1

- (a) Explain the function of the feature at Part X. [2]
- (b) Identify and describe **two** problems with the design of the mould. [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss the importance of vacuum forming in the packaging of products.

Your answer should:

- (i) analyse the given situation and identify **three** relevant issues raised by the question [3]
- (ii) explain why you consider these issues to be relevant [3]
- (iii) contain specific examples/evidence to support your conclusions. [2]

- 6 Fig. 6.1 shows an incomplete design for a metal bracket that is to be used to mount a television on to a wall. It is designed to fold back to the wall and allow the screen to tilt. A piece of metal box section connects a wall plate to the plate on the back of the television.

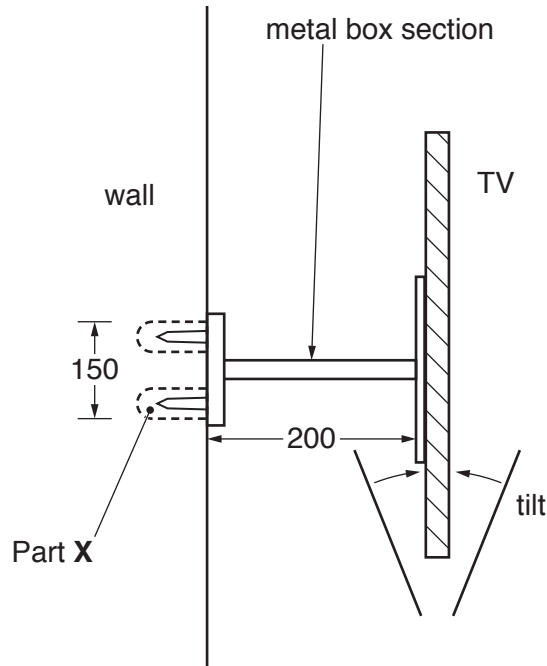


Fig. 6.1

- (a) Explain the function of Part X. [2]
- (b) Identify and describe **two** problems with the design of the metal bracket. [4]
- (c) Using notes and sketches, explain how the design of the metal bracket would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss why manufacturers are making increased use of standardised components in the production of household equipment and the effect this has on their customers.

Your answer should:

- (i) analyse the given situation and identify **three** relevant issues raised by the question [3]
- (ii) explain why you consider these issues to be relevant [3]
- (iii) contain specific examples/evidence to support your conclusions. [2]

Section C

Answer **one** question from this section on the plain A3 paper provided.

You are provided with two sheets of plain A3 paper. You should use **both** sides of the paper. **Each** of the four **parts (a)–(d)** of the question you choose to answer should take up one side of paper.

When you are asked to **develop** a design you must show, using notes and sketches, the development and evaluation of a **range** of ideas into a single solution. The design proposal should be annotated to give details about materials, joining methods and important sizes.

7 Fig. 7.1 shows an incomplete design for a wooden toy tipping truck.

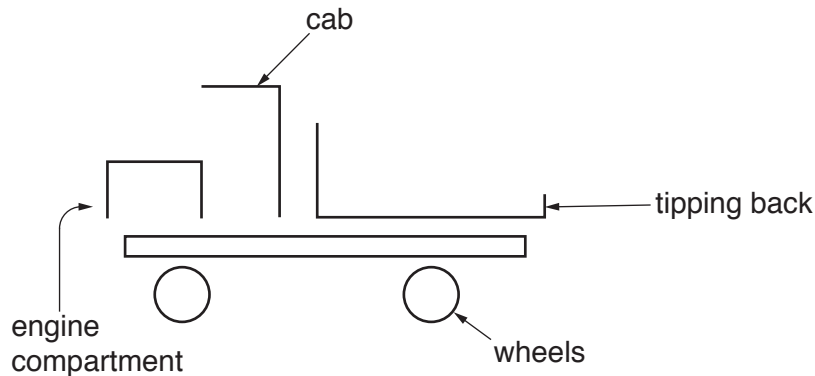


Fig. 7.1

(a) Using notes and sketches, **develop** a design for the tipping back that allows it to be adjusted and fixed at different angles. [20]

(b) Using notes and sketches, **develop** designs for the cab and engine compartment.

Your answer must include:

- lights
- bonnet/hood
- windscreen. [20]

(c) Using notes and sketches, **develop** designs for the wheels and a method of attaching them to the tipping truck. The wheels should be able to rotate. [20]

(d) Produce a pictorial (3D) rendered drawing of the complete tipping truck which shows all of the features that you have designed in **parts (a)–(c)**. The tipping back should be shown in a raised position. [20]

- 8 Fig. 8.1 shows an incomplete idea for a card box to package a new board game.

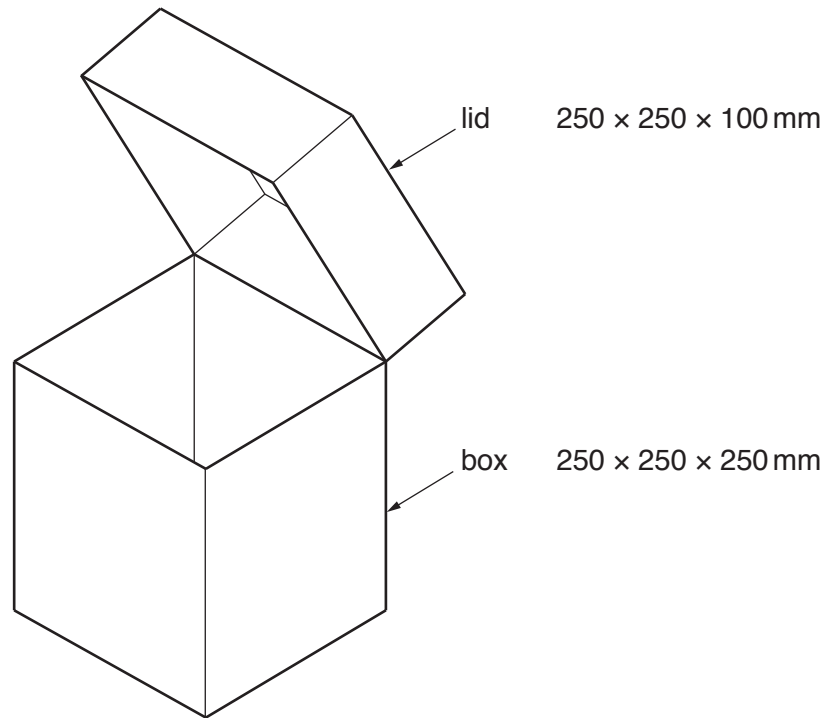


Fig. 8.1

- (a) Using notes and sketches, **develop** a design for the card box. The box must be made from a one piece development (net). It must be possible to open and securely close the box. [20]
- (b) Using notes and sketches, **develop** a design for the lettering to go on the top surface of the box. The name of the board game is 'Treasure Chest' and the lettering should be in a style that reflects the game. [20]
- (c) Using notes and sketches, **develop** a visual design for one side of the box. Your design should include the game's name. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete card box with the box open, showing all of the features that you have designed in **parts (a)–(c)**. [20]

- 9 Fig. 9.1 shows an incomplete idea for a college chair with a book rest.

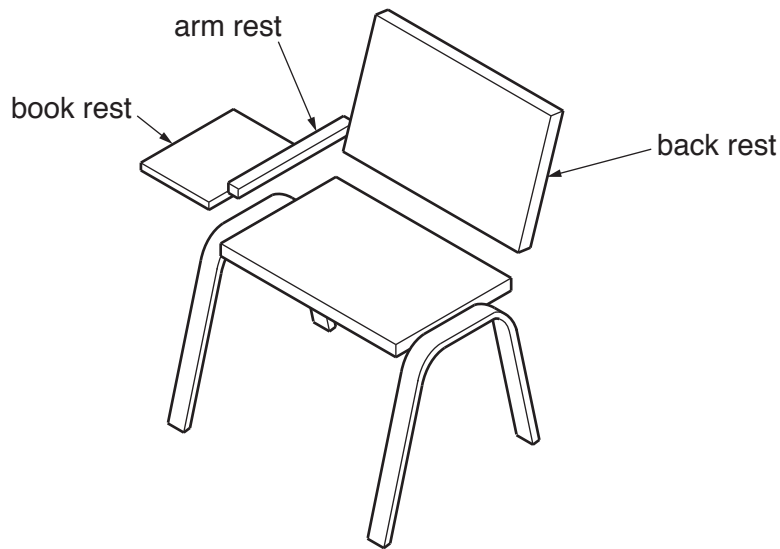


Fig. 9.1

- (a) Using notes and sketches, **develop** a design for a back rest. The design must include a method of attaching the back rest to the base of the college chair. [20]
- (b) Using notes and sketches, **develop** a design for an arm rest. The design must include a method of attaching the arm rest to the frame of the chair. [20]
- (c) Using notes and sketches, **develop** a design for a book rest for the chair. It must be possible to move the book rest out of the way for ease of access to the chair. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete college chair which shows all of the features that you have designed in **parts (a)–(c)**. [20]

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