



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

DESIGN AND TECHNOLOGY

9705/13

Paper 1

October/November 2011

3 hours

Additional Materials: Answer Booklet/A4 Paper
A3 Drawing Paper (3 sheets)
Extra sheets of A3 drawing paper for candidates who have used up both sides of their 3 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 a soft pencil, or coloured pencils/pens as appropriate, for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO NOT WRITE ON 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 both sides of each of the 3 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 shows a magazine rack, constructed from pine, which is to be made in a school workshop.

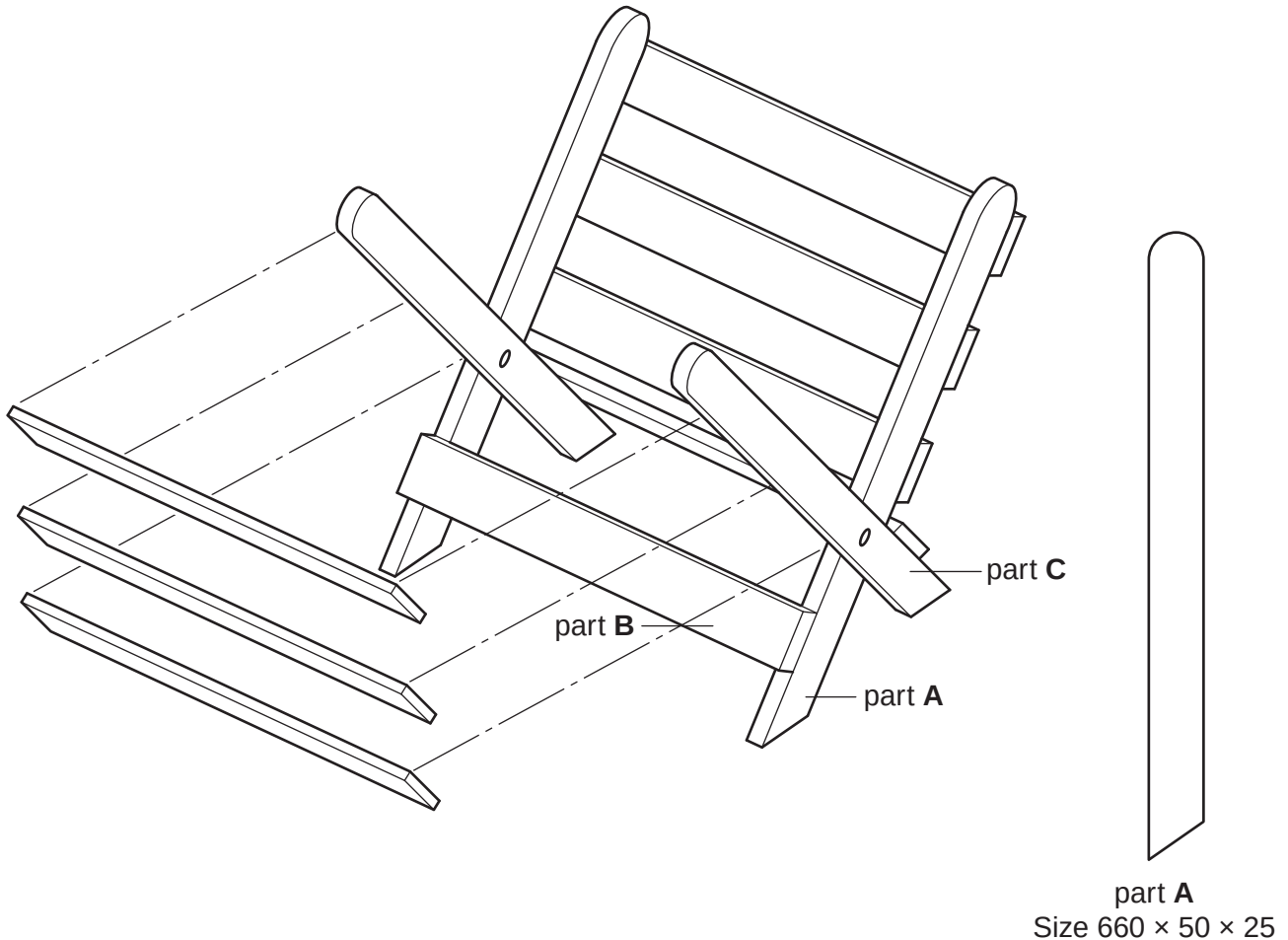


Fig. 1

- (a) Name a suitable finish that could be applied to the pine and give **one** reason for your choice. [2]
- (b) Use notes and sketches to describe:
- (i) how the ends of part **A** could be cut to shape and the edges of the wood smoothed; [6]
 - (ii) how parts **A** and **B** could be joined using countersunk screws; [6]
 - (iii) a method of joining parts **A** and **C** that allows the rack to fold flat. [6]

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

- 2 Fig. 2 shows the development (net) of a leaflet holder made from card.

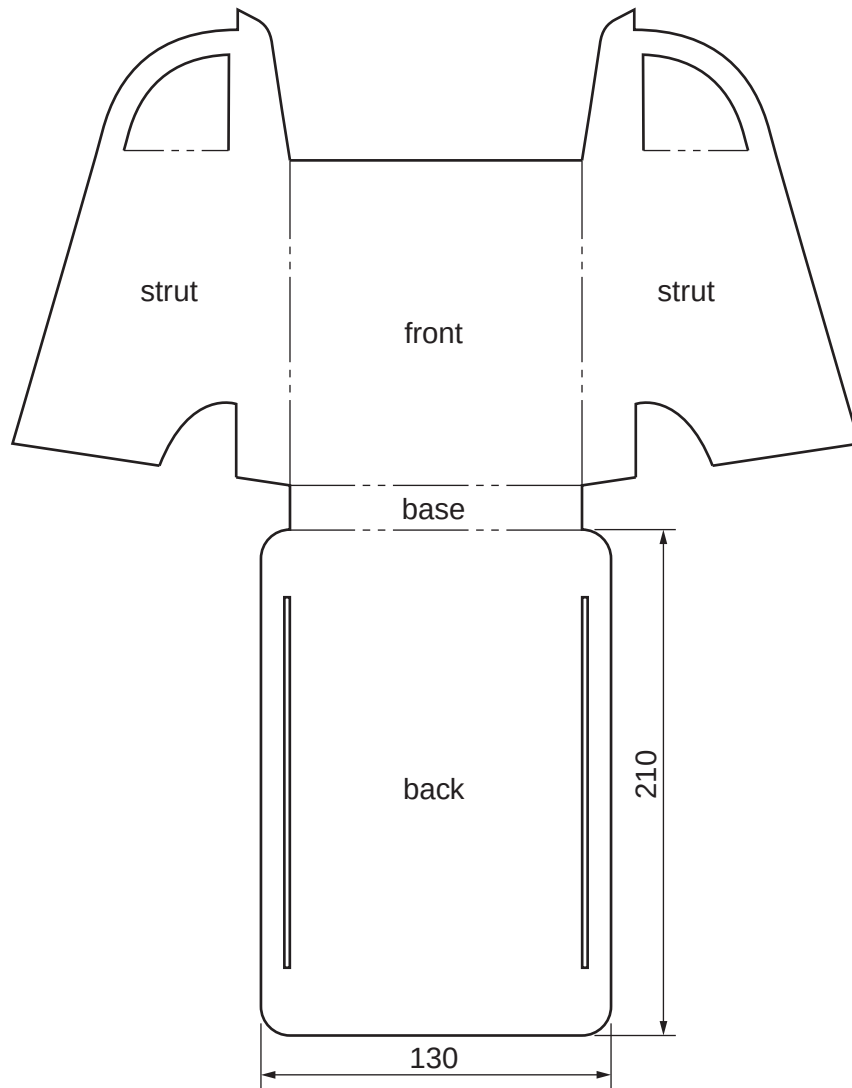


Fig. 2

- (a) State a suitable thickness of card for making the leaflet holder and give **one** reason for your choice. [2]
- (b) Sketch a pictorial (3D) view of the assembled leaflet holder. [6]
- (c) Use notes and sketches to describe how the development (net) could be cut out and the folds made to produce a one-off prototype of the leaflet holder. [6]
- (d) The leaflet holder will be mass produced using the die cutting process. Use notes and sketches to describe the die cutting process. [6]

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

- 3 Fig. 3 shows a clock which is to be made in a school workshop.

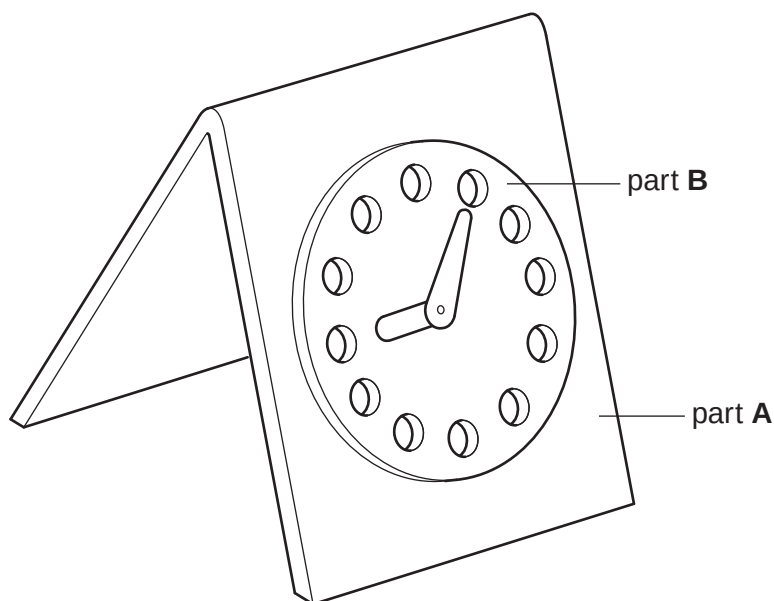


Fig. 3

- (a) Name a suitable sheet material for making parts **A** and **B** and give **one** reason for your choice. [2]
- (b) Use notes and sketches to describe:
- (i) how part **A** could be bent; [6]
 - (ii) how part **B** could be cut out and the edges of the sheet material smoothed and polished; [6]
 - (iii) how the holes in part **B** could be marked out and drilled. [6]

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

Section B

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

- 4 Fig. 4 shows a design for packaging a chocolate egg and a symbol that is printed on the back of the packaging.

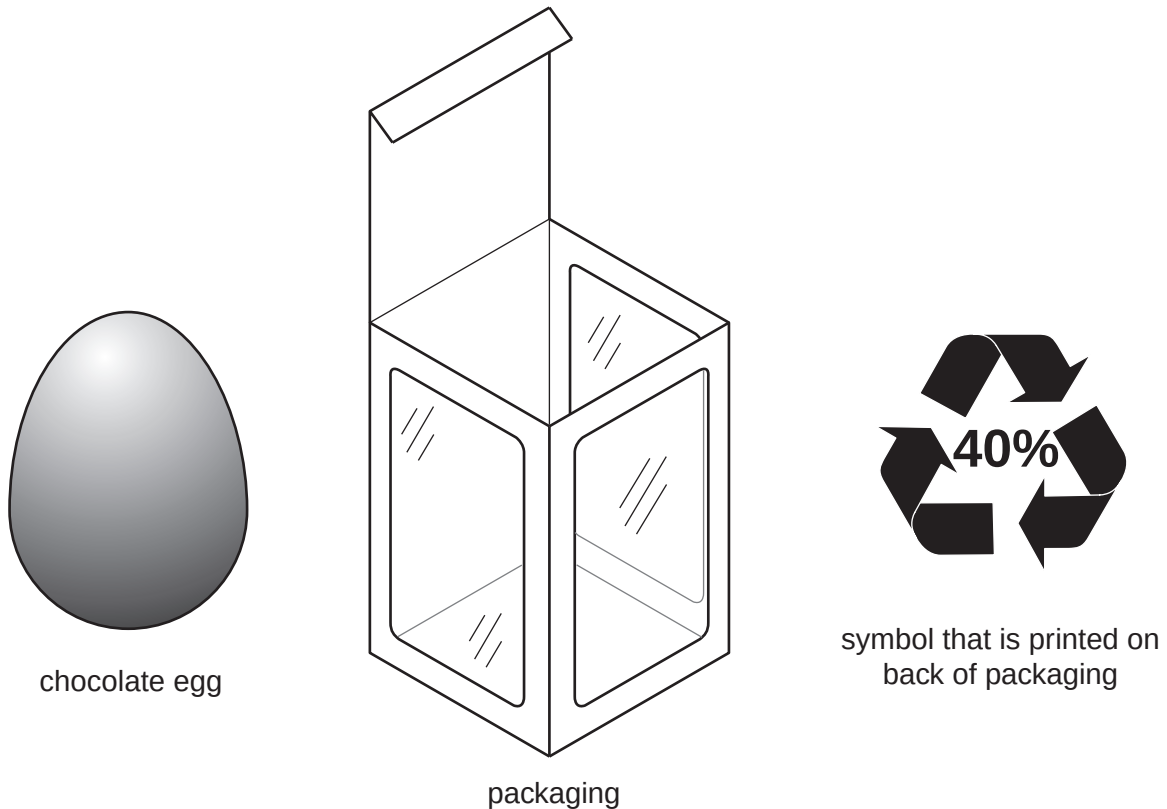


Fig. 4

- (a) Explain what the symbol means. [2]
- (b) Describe **two** problems with the design of the packaging. [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the two problems you have identified in (b). [6]
- (d) Discuss why packaging is often considered to be 'environmentally unfriendly'.

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 as support for your conclusions. [2]

5 Fig. 5 shows a range of designs for storing CDs.

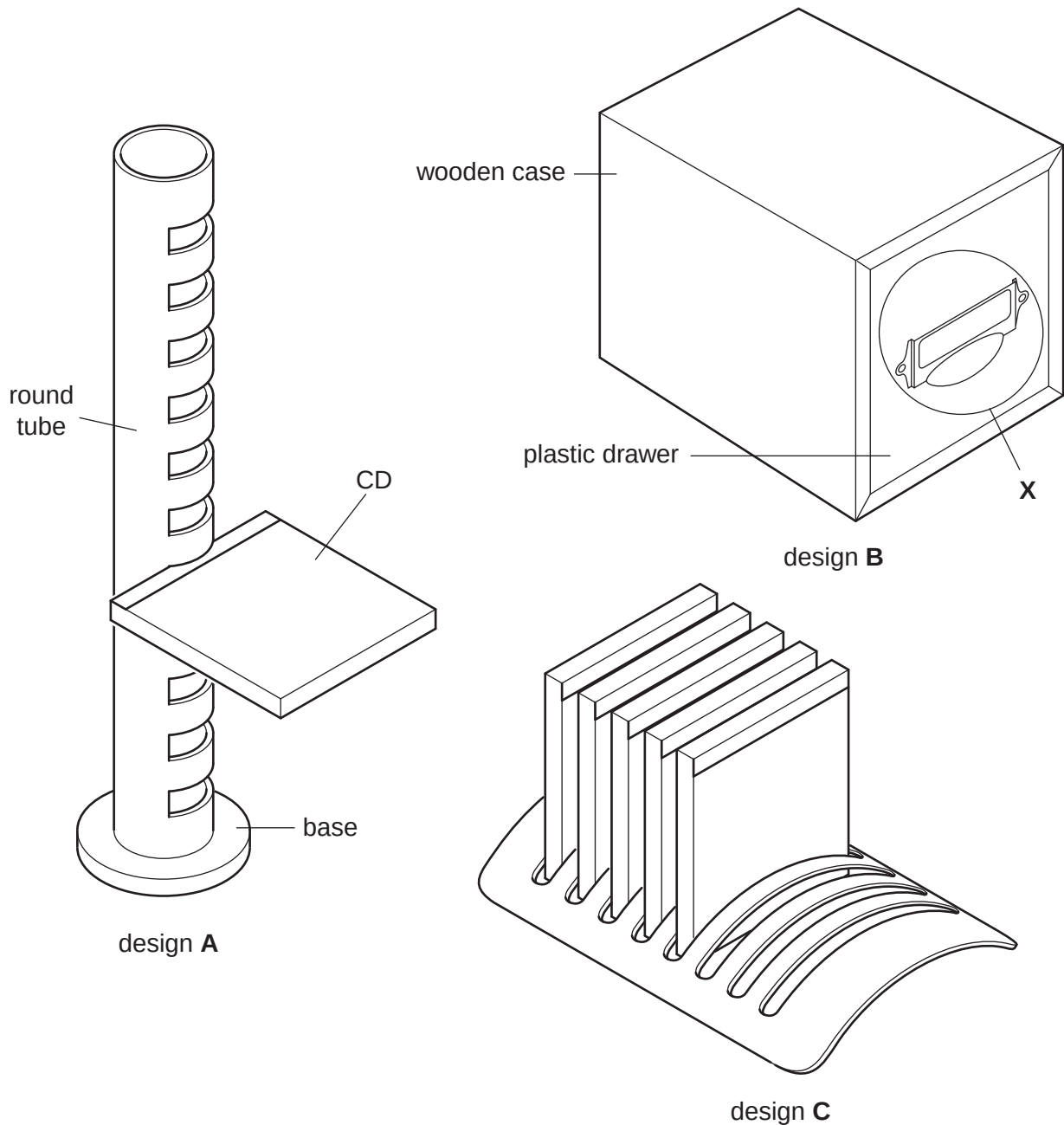


Fig. 5

- (a) Explain the purpose of the design feature shown at X. [2]
- (b) Describe **two** problems with design A. [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the two problems you have identified in (b). [6]
- (d) Discuss the ways in which a designer would use a prototype model of a CD storage system to test the design before the final product is manufactured.
- 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 as support for your conclusions. [2]

- 6 Fig. 6 shows a range of designs for free-standing advertising boards. Businesses stand these boards outside their premises.

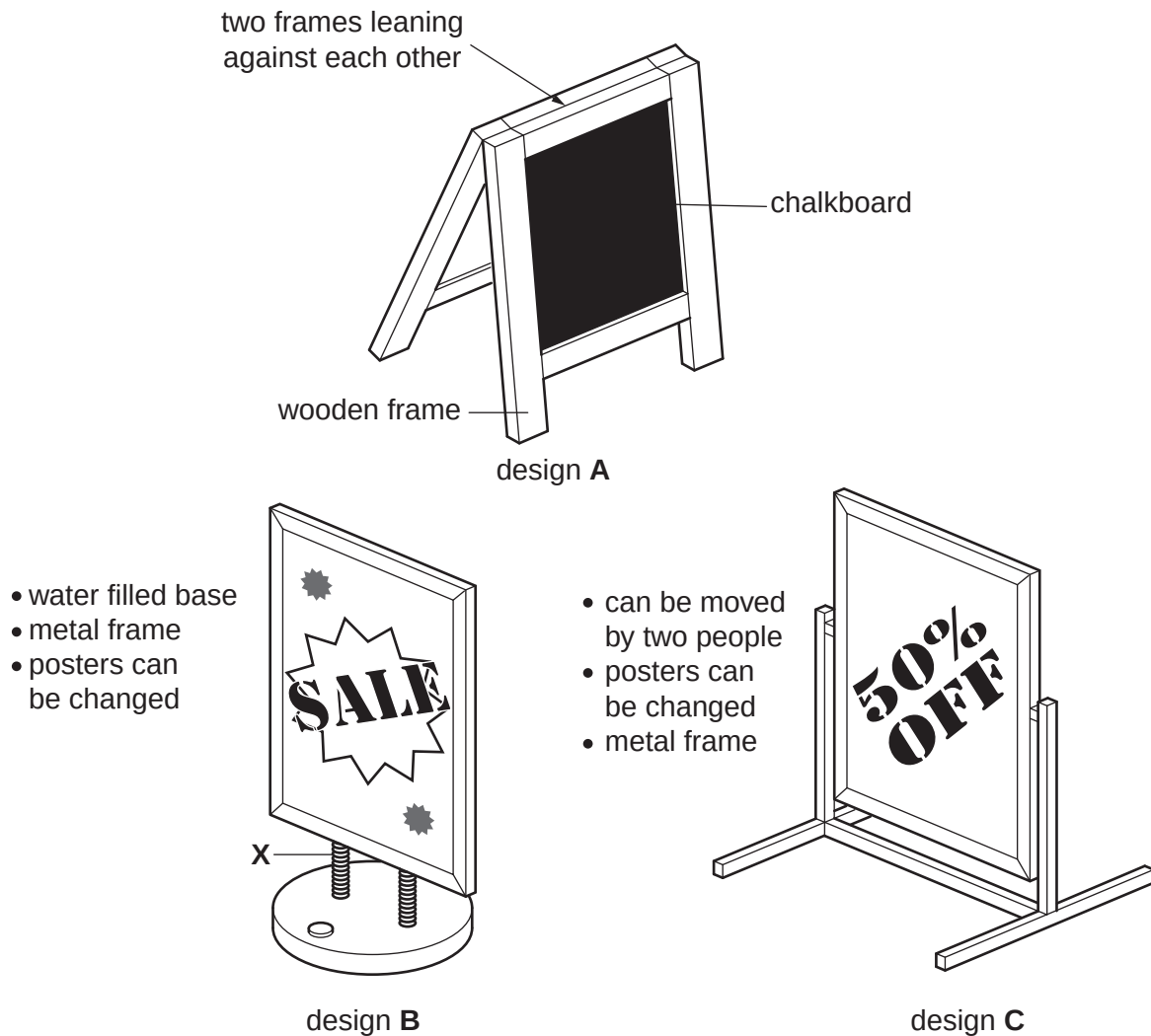


Fig. 6

- (a) Explain the function of the design feature shown at X. [2]
- (b) Describe **two** problems with design A. [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the two problems that you have identified in (b). [6]
- (d) Discuss why cafés, restaurants and small local shops frequently prefer to use advertising boards like the one shown in design A rather than designs like B and C.

Your answer should:

- (i) analyse the given situation and identify three relevant issues raised by the question; [3]
- (ii) explain why you consider these points 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 three sheets of plain A3 paper. You should use **both** sides of the paper. **Each** of the five parts **(a) – (e)** of the question that you choose to answer should take up one side of the 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 design proposal. The design proposal should be annotated to give details about materials, joining methods and important sizes.

7 Fig. 7 shows an incomplete idea for a push-along toy aeroplane.

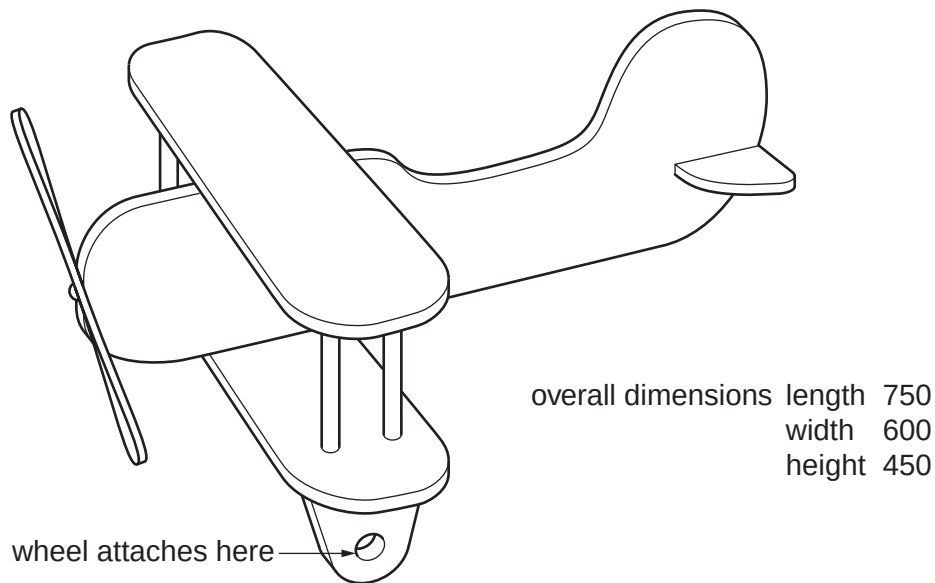


Fig. 7

- (a) Using notes and sketches, **develop** a design which allows a child to sit comfortably on the aeroplane when it is being pushed along. [16]
- (b) Using notes and sketches, **develop** designs for footrests and hand holds that a child could use when sitting on the aeroplane. [16]
- (c) Using notes and sketches, **develop** a design for the aeroplane's two front wheels. The design must include a method of attaching the wheels to the aeroplane. [16]
- (d) Using notes and sketches, **develop** a design which allows an adult to push the aeroplane along without having to bend down. [16]
- (e) Produce a pictorial rendered drawing of the complete toy aeroplane which shows all of the features that you have designed in **(a) – (d)**. [16]

- 8 Fig. 8 shows an incomplete idea for a free standing display stand to hold DVDs. The stand will be manufactured in flat pack form from 5 mm thick corrugated cardboard.

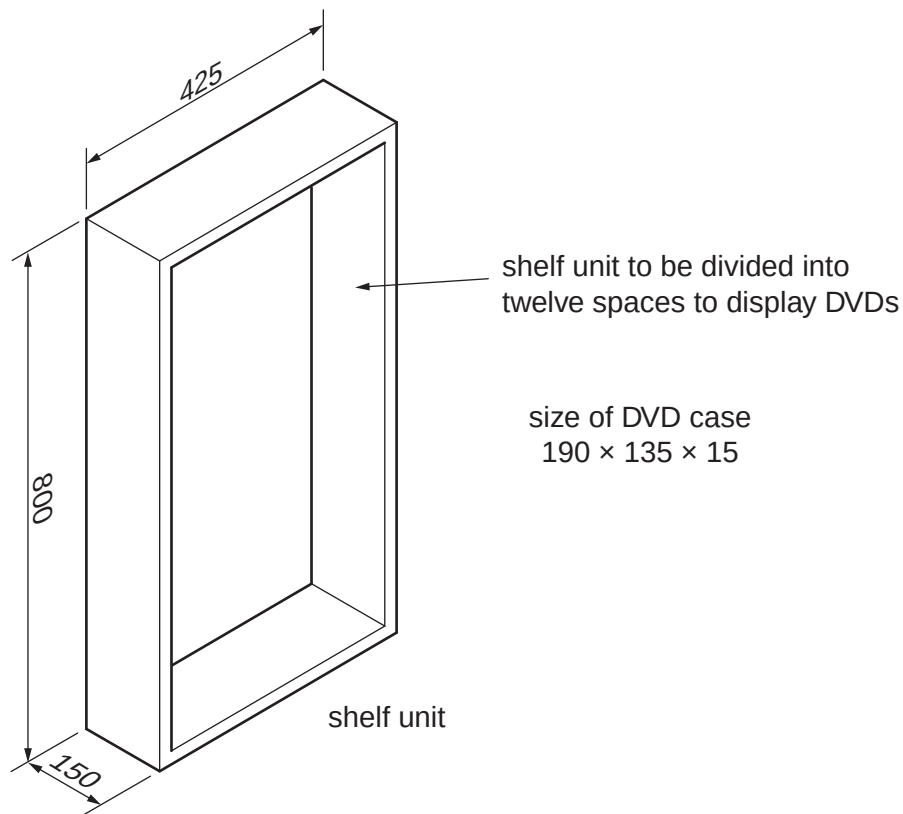


Fig. 8

- (a) Using notes and sketches, **develop** a design for a base unit which supports the shelf unit at a height of 500 millimetres above the ground. The design must include a method that joins the base unit to the shelf unit but allows it to be removed and replaced without causing damage to either unit. [16]
- (b) Using notes and sketches, **develop** a design which divides the shelf unit into twelve spaces. The design must include a method that joins the dividers to the shelf unit but allows them to be removed and replaced without causing damage to either the dividers or the shelf unit. [16]
- (c) Using notes and sketches, **develop** a design for a holder for entry forms for a competition to win a portable DVD player. This must be capable of being attached to the display stand without the use of glue or any other additional materials. [16]
- (d) Using notes and sketches, **develop** a design for the lettering to go on the display stand. This should consist of the title of the DVD '**Midnight in the City**' and should be in a style that reflects the title. [16]
- (e) Produce a pictorial rendered drawing of the complete display stand which shows all of the features that you have designed in (a) – (d). [16]

- 9 Fig. 9 shows an incomplete idea for a tray-clearing trolley. Students using a school canteen will return trays, crockery and litter to the trolley.

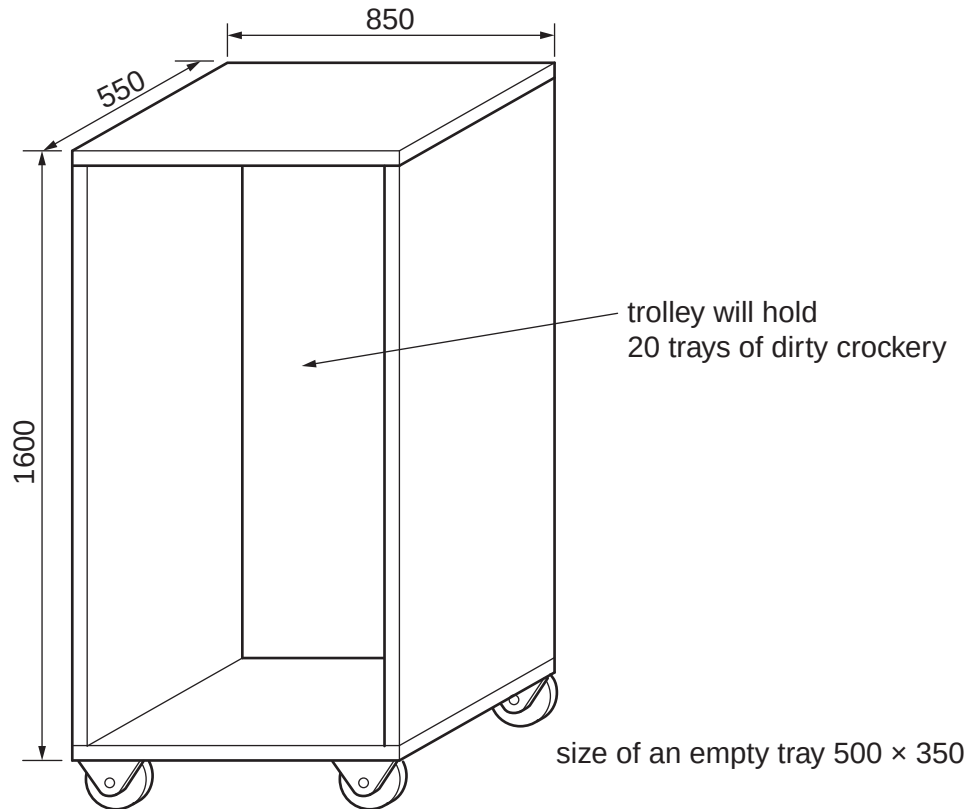


Fig. 9

- (a) Using notes and sketches, **develop** a design which allows 20 trays full of dirty crockery to be put in the trolley. [16]
- (b) Using notes and sketches, **develop** a design for a handle that allows the trolley to be pushed and pulled. [16]
- (c) Using notes and sketches, **develop** a design for a waste bin which could be attached to the trolley. The bin must have a lid that can be easily opened and closed. [16]
- (d) Using notes and sketches, **develop** a design which allows the waste bin to be attached and easily removed from the trolley without the use of any tools. [16]
- (e) Produce a pictorial rendered drawing of the complete trolley which shows all of the features that you have designed in (a)–(d). [16]

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