



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

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DESIGN AND TECHNOLOGY

9705/12

Paper 1

October/November 2012

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 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.

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 **11** printed pages and **1** blank page.



Section A

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

- 1 Fig. 1 shows a CD rack which is to be made in a school workshop.

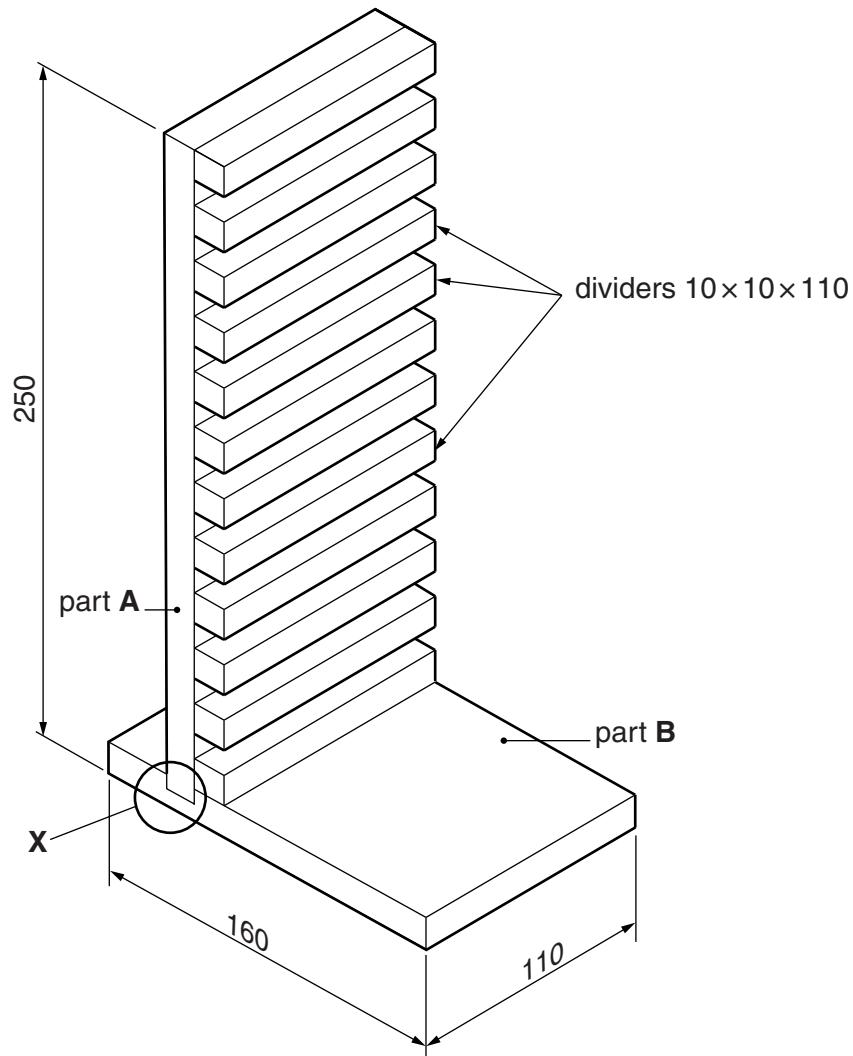


Fig. 1

- (a) Parts **A** and **B** are made from 9 mm thick plywood.
Use notes and a sketch to explain what 9 mm thick plywood looks like. [2]
- (b) Use notes and sketches to describe:
- how a jig could be made and used to make sure that all of the dividers are cut to the same length; [6]
 - how the joint shown at **X** could be made; [6]
 - how a painted finish could be applied to the CD rack. [6]

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

- 2 Fig. 2 shows a card money box which is to be made in a school workshop.

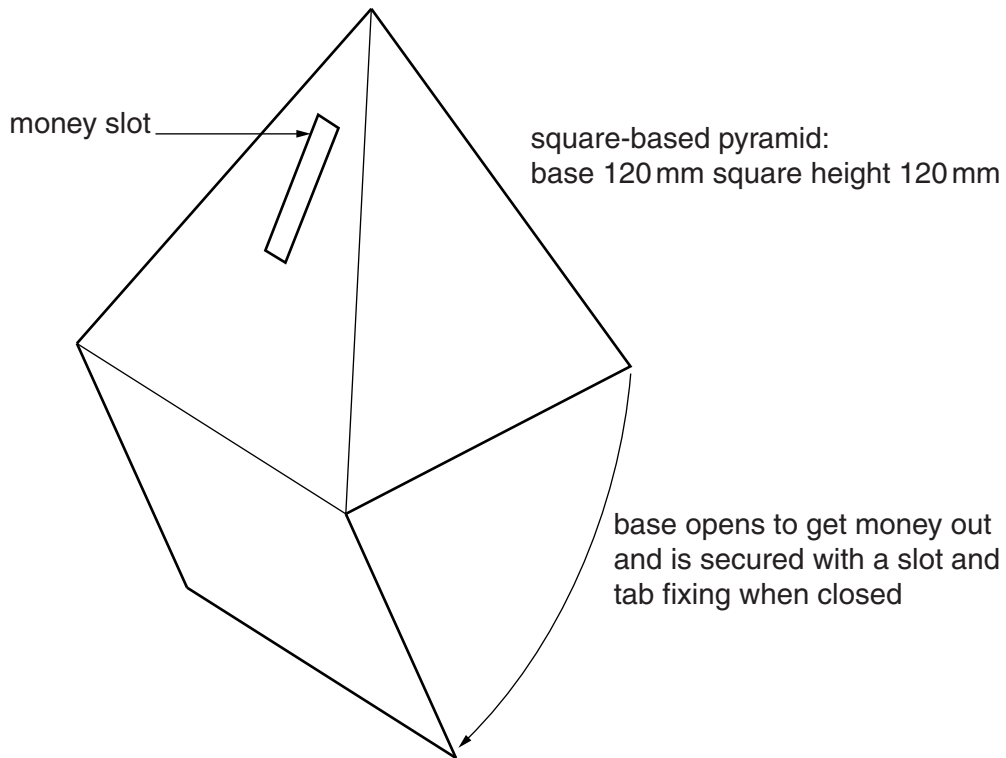


Fig. 2

- (a) Name a suitable finish that could be applied to the card and give **one** reason for your choice. [2]
- (b) Use notes and sketches to describe how a slot and tab fixing could be used to hold the base securely in a closed position. [6]
- (c) Sketch to an appropriate scale the one-piece development (net) required to make the money box. [6]
- (d) Use notes and sketches to describe how a die cutter could be used to make the money slot. [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 shows a bird's nestbox which is to be made in a school workshop.

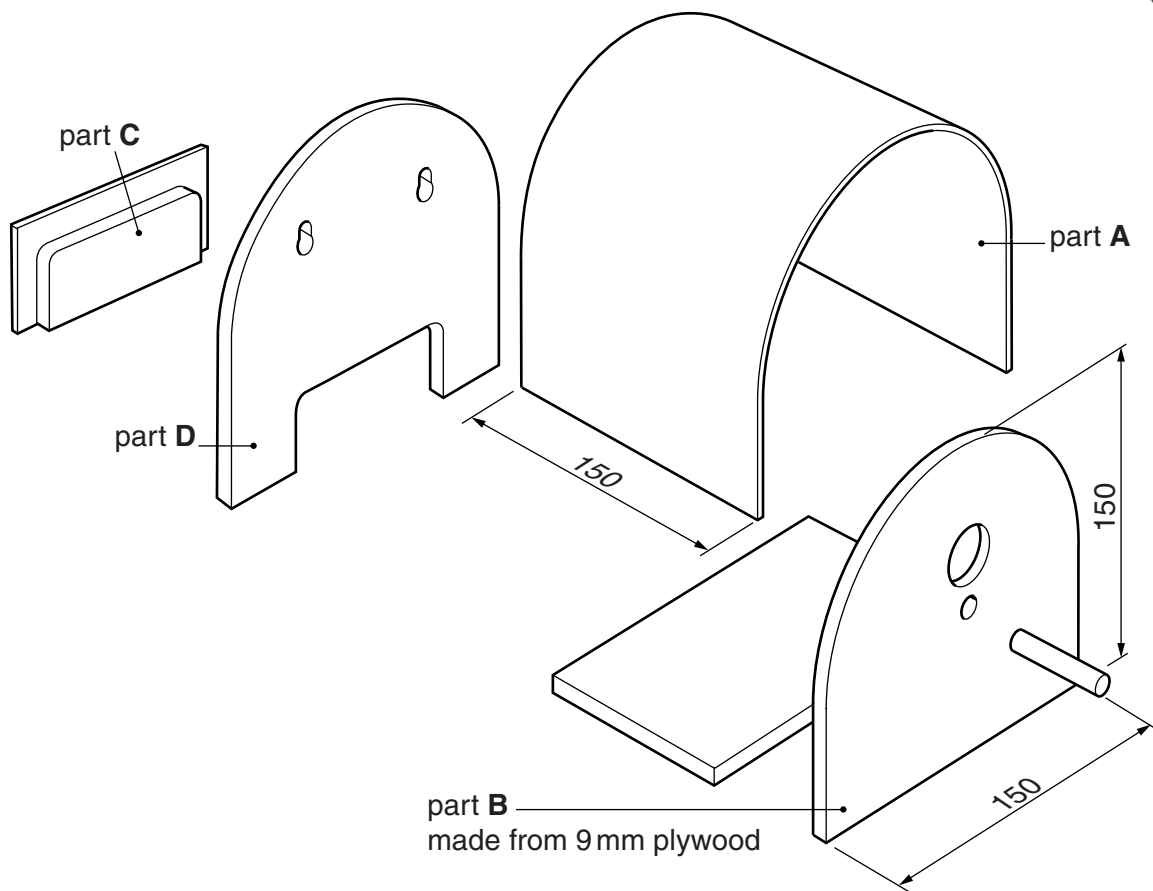


Fig. 3

- (a) Name a suitable sheet material for making part **A** and give **one** reason for your choice. [2]
- (b) Use notes and sketches to describe:
- how part **A** could be bent to the required shape; [6]
 - how part **B** could be cut to the required shape, the edges of the plywood smoothed and the two holes drilled; [6]
 - how part **C** could be joined to part **D** so that it can be easily removed to allow the inside of the bird's nestbox to be cleaned. [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 competition entry form and a design for a card tray to hold the forms. Trays full of forms will be located in shops selling the MP3 player.

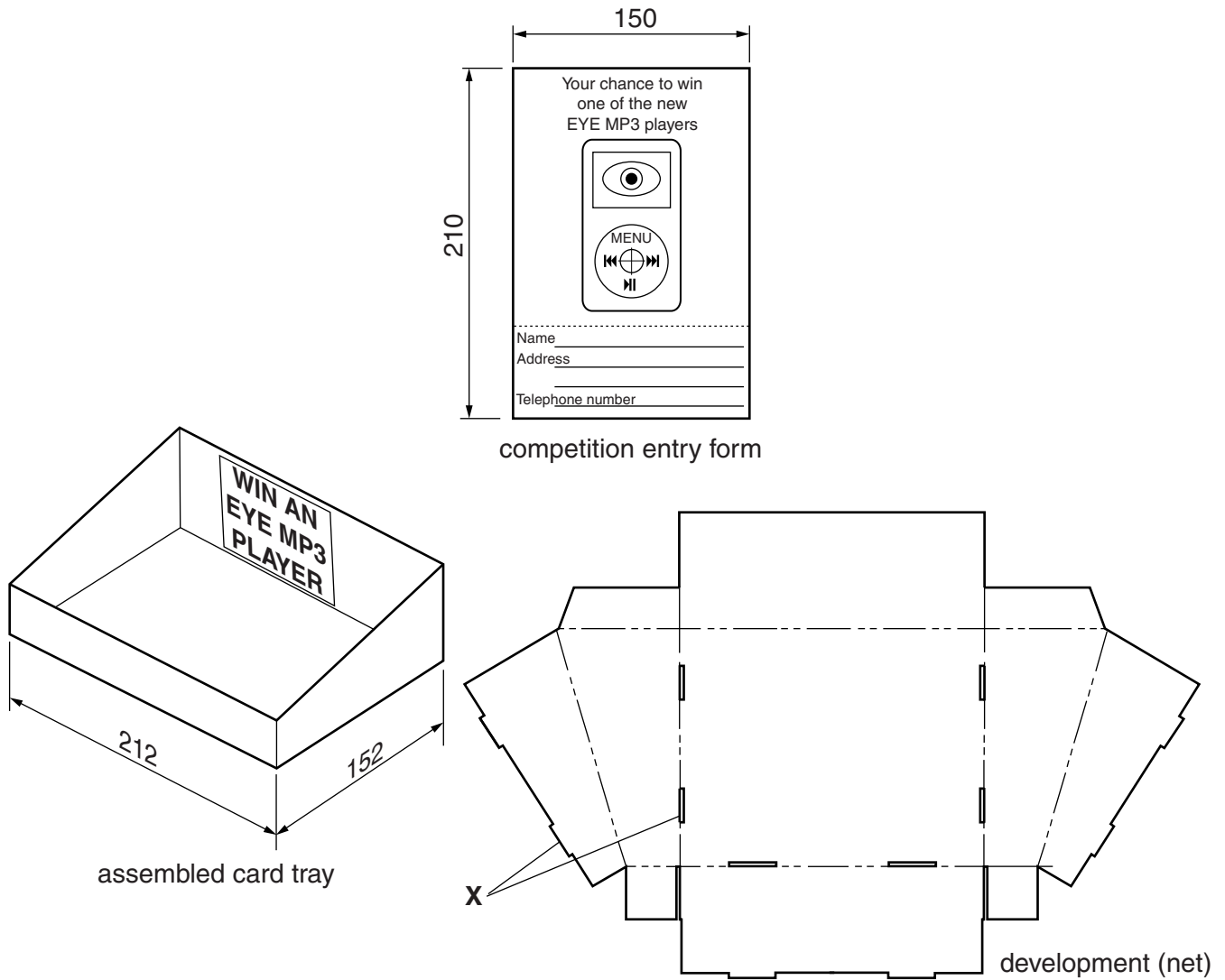


Fig. 4

- (a) Using notes and a sketch explain the function of the design feature shown at **X**. [2]
- (b) Identify and describe **two** problems with the design of the tray. [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 the merits of designing this type of product so that it can be assembled using the use of glue.

Your answer should:

- (i) analyse the given situation and identify three relevant issues raised by the question; [3]
- (ii) explain why you consider these three 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 stacking chairs.

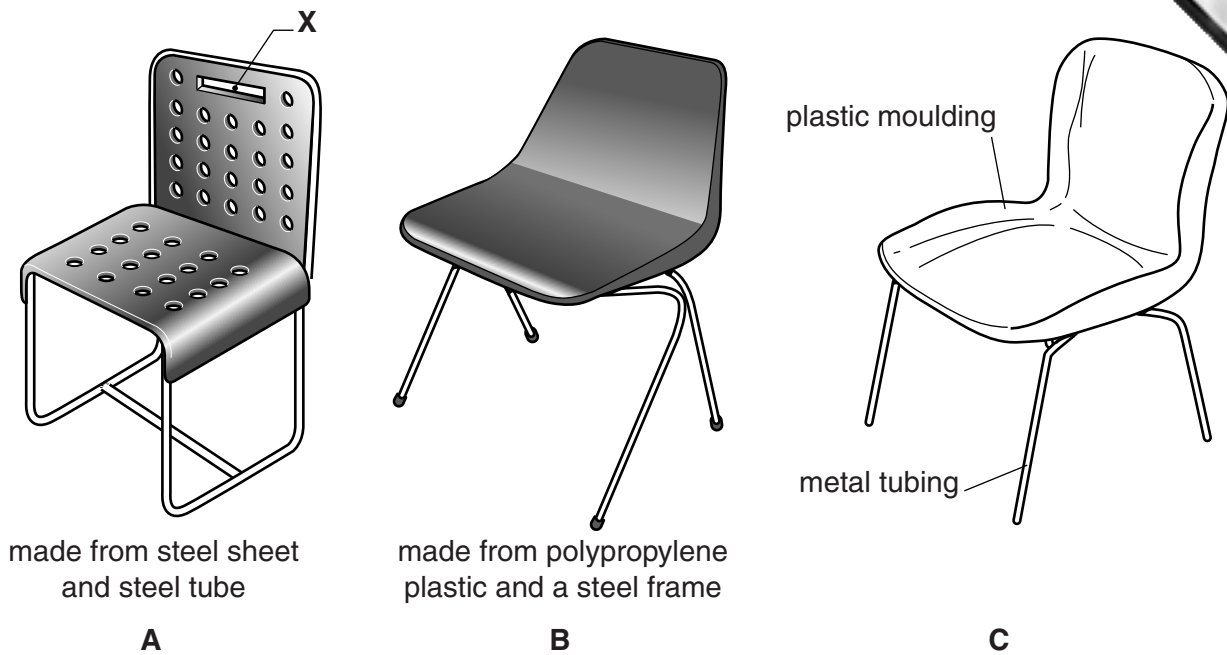


Fig. 5

- (a) Explain the function of the design feature shown at **X**. [2]
- (b) Identify and describe **two** problems with design **A** that make it unsuitable for use as a stacking chair. [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 the use of plastic and metal in the manufacture of furniture could be considered 'environmentally unfriendly'. [6]

Your answer should:

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

- 6 Fig. 6 shows the design for a safety poster on how to use spray paint.



Fig. 6

- (a) Explain what the symbol at **X** means. [2]
- (b) Identify and describe **two** problems with the design that make it unsuitable for use as a safety poster. [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 functional and aesthetic effects of applying a surface finish or treatment to a product.

Your answer should:

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

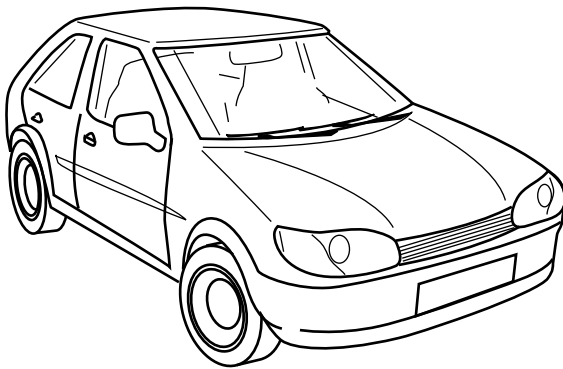
Section C

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** 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 design proposal. The design proposal should be annotated to give details about materials, joining methods and important sizes.

- 7 Fig. 7 shows a model car and an incomplete idea for the card box in which it will be packaged.



model car size $200 \times 90 \times 70$

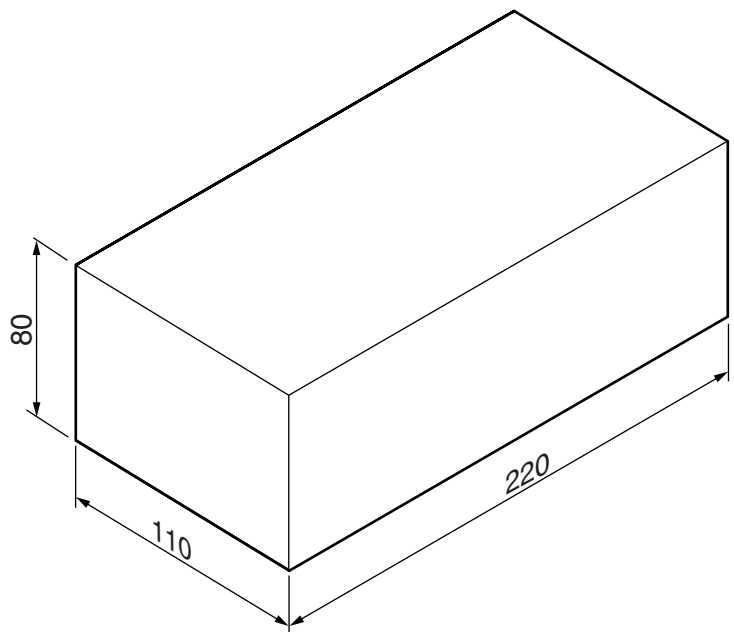


Fig. 7

- (a) Using notes and sketches, develop a design for a plastic insert which will prevent the car moving in the box. [20]
- (b) Using notes and sketches, develop a design for the card box. The box must be made from a one-piece development (net) and include a window so that most of the model car can be seen while still in the closed box. It must be possible to open and close the box. [20]
- (c) Using notes and sketches, develop a design for the lettering to go on the packaging. The name of the car will be 'The Ellipse' and the lettering should be in a style that reflects the name. [20]
- (d) Produce an exploded pictorial rendered drawing of the complete packaging which shows all of the features that you have designed in (a)–(c). Do not include the model car in this drawing. [20]

- 8 Fig. 8 shows an incomplete idea for a mobile clothes storage trolley to be used at a p

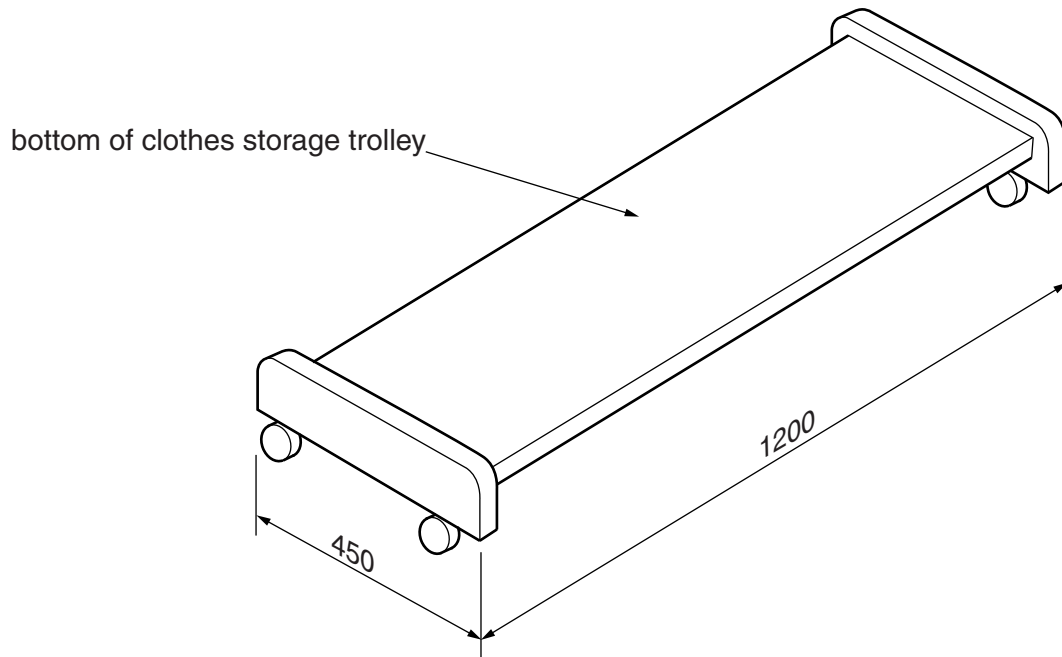


Fig. 8

- (a) Using notes and sketches, develop a design which allows up to 20 coats to be hung on the trolley. [20]
- (b) Using notes and sketches, develop a design which allows up to 20 pairs of shoes to be stored on the trolley. The design must prevent the shoes from getting mixed up. [20]
- (c) Using notes and sketches, develop a design for a detachable handle that allows the trolley to be pushed and pulled. The handle must be easily fixed to, and easily removed from, the trolley. [20]
- (d) Produce a pictorial rendered drawing of the complete trolley which shows all of the features that you have designed in (a)–(c). [20]

- 9 Fig. 9 shows an incomplete idea for a desk for a teenager's bedroom.

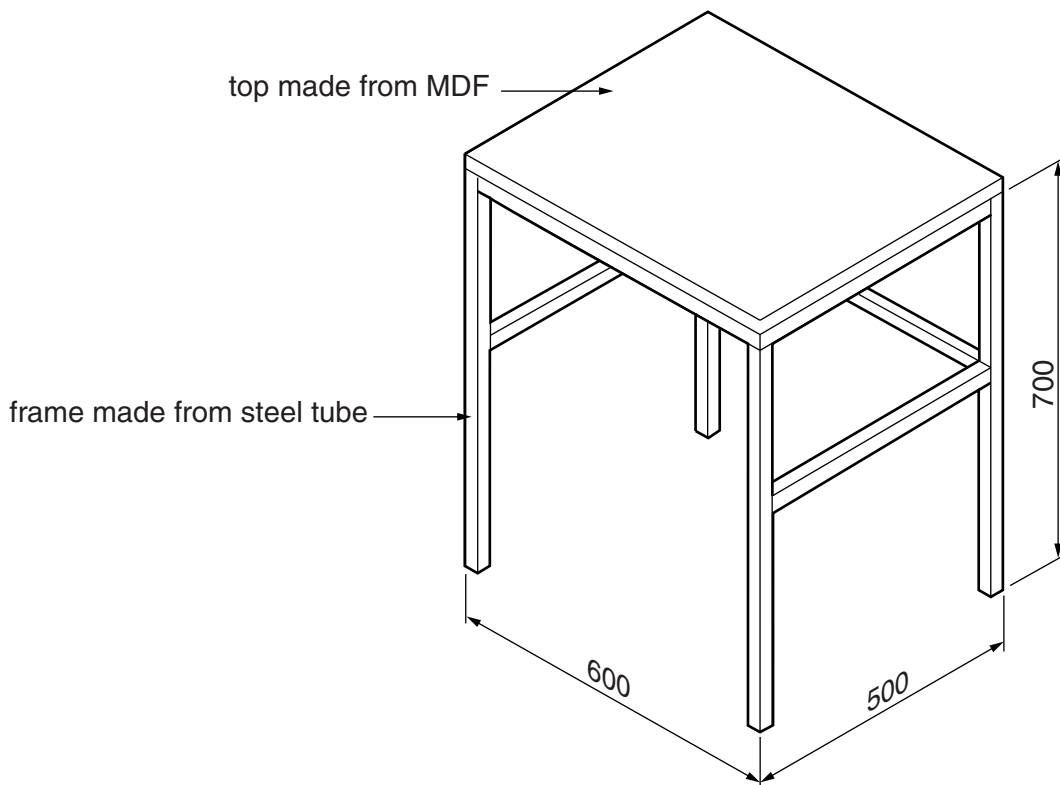


Fig. 9

- (a) Using notes and sketches, develop a design for a pull-out shelf to go under the desk top which will hold a laptop or keyboard. The shelf must push back under the desk when not in use. [20]
- (b) Using notes and sketches, develop a design for a flap that will increase the size of the top of the desk to 500×1000 . The flap must fold down when not in use but be easily raised and held in a horizontal position when required. [20]
- (c) Using notes and sketches, develop a design for a shelf unit which will stand on top of the desk. The overall size of the unit must be 500 wide, 150 deep and 750 high. It must be possible to adjust the distance between the shelves. [20]
- (d) Produce a pictorial rendered drawing of the complete desk which shows all of the features that you have designed in (a)–(c). [20]