

Question 1

Orthographic views of the parts of a wooden toy duck are shown on the right. The toy is purchased as a kit for assembly at home. The kit contains:

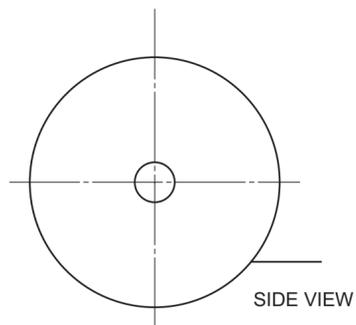
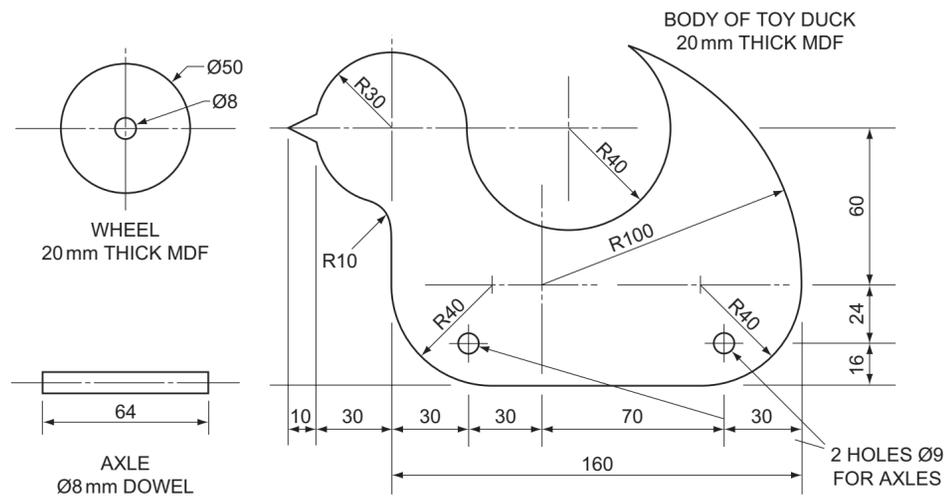
- 1 × body;
- 4 × wheels;
- 2 × axles;
- PVA glue.

Assembly instructions

- 1 Paint the parts of the toy duck and allow to dry.
- 2 Glue one wheel onto the end of each axle.
- 3 Insert an axle into each of the Ø9 holes and push through the body of the duck. Glue another wheel onto the free end of the axle.

(a) In the space below complete the following full size drawings of the fully assembled toy:

- (i) the side view; [13]
- (ii) the plan. [8]



PLAN VIEW

(b) A pictorial instruction leaflet is required to show how the toy duck is to be assembled. Complete the leaflet below by adding suitable illustrations for steps 1 and 3. [5]

<p>STEP 1 Paint the parts of the toy and leave to dry for 24 hours.</p>	<p>STEP 2 Glue one wheel onto the end of each axle.</p>	<p>STEP 3 Push the front axle through the body and glue on the second wheel. Leave to dry for 1 hour. Repeat the process for the back axle.</p>

(c) In the space below use sketches and notes to show one idea for a colour scheme for the toy duck. [2]

(d) In the space below produce a three dimensional sketch of the fully assembled toy duck in your chosen colour scheme. [6]

[Turn over

SHEET 1 OF 2 (SECTION 1)

Print your surname, other names, Centre number and candidate number in the spaces provided.
 Answer **one** question only from Section 1 (Questions 1 and 2).
 Answer **two** questions only from Section 2 (Questions 3 to 6).
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Candidate's Surname

Other Names

Centre Number

Candidate's Number

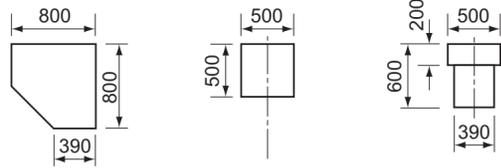
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Question 2

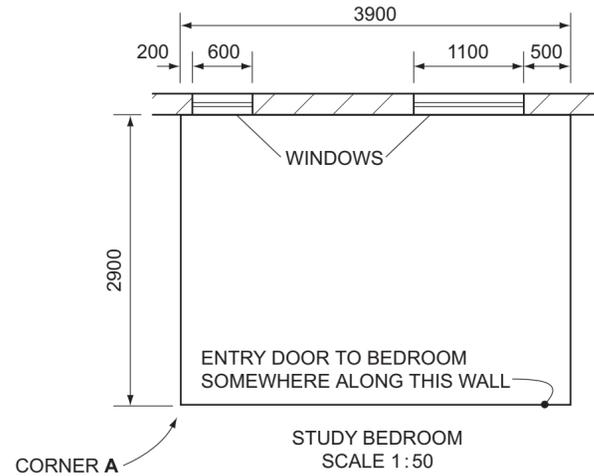
A sketch of a study bedroom in a boarding school is shown on the right.

The teachers are to consider the possibility of having an en suite bathroom facility in the single rooms provided for senior students. The specification points for the en suite bathroom facility are:

- size of en suite bathroom 1900 mm × 1800 mm;
- access to en suite bathroom via a 750 mm wide internal door from the study bedroom;
- internal walls separating the en suite bathroom and the study bedroom are to be 100 mm thick;
- the en suite bathroom to include a shower, washbasin and a toilet. The sizes of these are shown below.

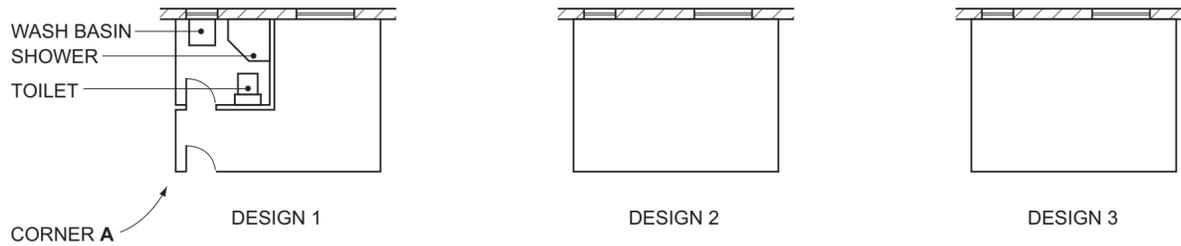


SHOWER TRAY WASH BASIN TOILET



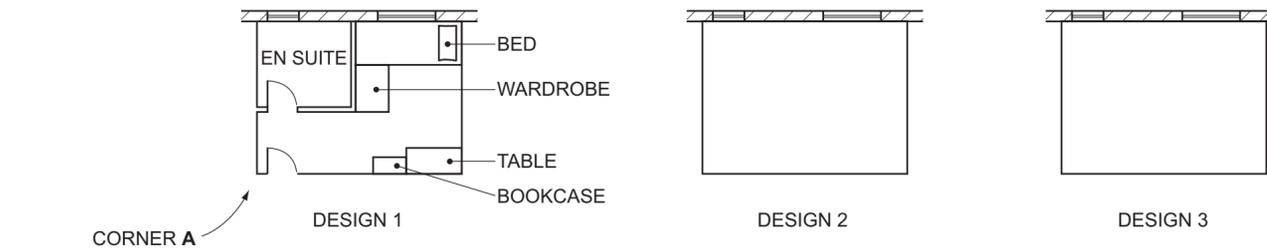
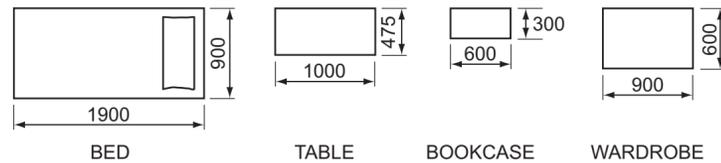
STUDY BEDROOM
SCALE 1:50

- (a) A sketch of a possible layout for the en suite bathroom is shown below as Design 1. In the spaces provided use sketches and notes to show two further ideas for the position of the en suite in the study bedroom and the layout of the facilities (shower, washbasin and toilet). [6]



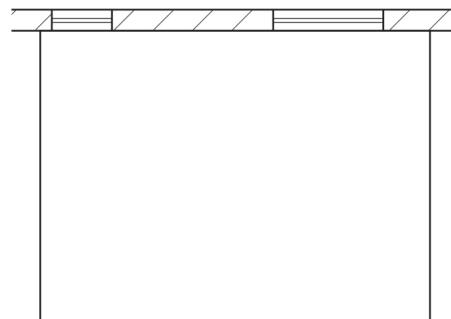
The study bedrooms are to be equipped with:

- a bed 1900 mm long × 900 mm wide;
- a table in plan 1000 mm × 475 mm;
- a bookcase in plan 600 mm × 300 mm;
- a wardrobe 900 mm wide by 600 mm deep in plan.



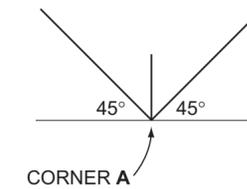
- (b) A sketch of a possible layout for the study bedroom is shown above as Design 1. In the spaces provided use sketches and notes to show two further ideas for the layout of the furniture in the study bedroom. Show the position of the en suite bathroom in the study bedroom but do not include details of the shower, washbasin and toilet. [6]

- (c) Combine the best of your designs for the en suite bathroom and the study bedroom to produce a 1:50 scale plan view of this final design proposal in the space to the right. [5]



YOUR FINAL DESIGN
SCALE 1:50

- (d) Design 1 for the en suite bathroom and Design 1 for the study bedroom have been selected as the final layout. Draw a planometric view of this final design proposal to a scale of 1:25. Corner A has been given as a starting point. The walls are 2400 mm high. Estimate any dimensions not given. [14]



- (e) To the above drawing add a colour scheme based upon the theme 'peace and harmony'. [3]

Question 3

A small area of a park is to be turned into a children's play area. The designer wishes to produce a 1:200 (5 mm = 1 metre) illustration of the play area so that local residents can consider the proposal.

(a) In the space below complete the outline of the play area from the following information.

- AB = 24 metres BC = 20 metres CD = 16 metres
- DE = 22 metres EA = 14 metres Angle ABC = 90°
- BD = 30 metres

[8]



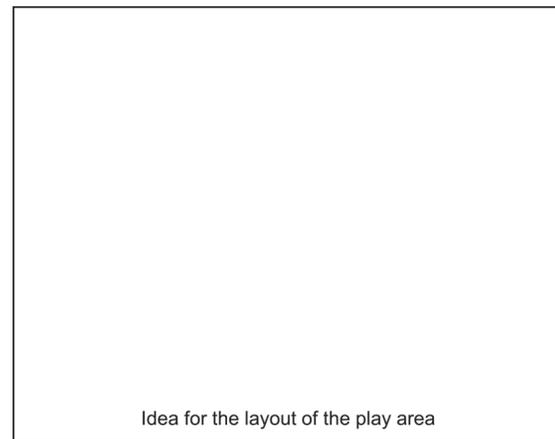
(b) Trees with a spread (diameter of branches) of 6 metres are to be planted at each corner of the play area. An example of a tree is given at corner A. Add the four missing trees to your illustration of the play area. [6]

(c) A path, two benches and sand pit are to be included in the play area. In the box on the right produce a sketch and notes to show your idea for the layout of these features in the play area. Consider the following specification points in your designs.

- The path is 1 metre wide and starts at the middle of side AB and gently curves across to the middle of side DE in a radius of 22 metres.
- A sand pit with an area of 64 m² is to be positioned so that it is not under the spread of any of the trees.
- Two benches (each 2.5 metres long and 0.5 metres wide) are to be positioned close to the path so that parents can watch their children play in the sand pit. [7]

(d) Add the path and your chosen layout for the benches and sand pit to the 1:200 illustration of the play area. [6]

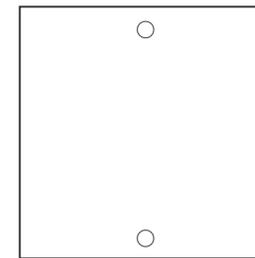
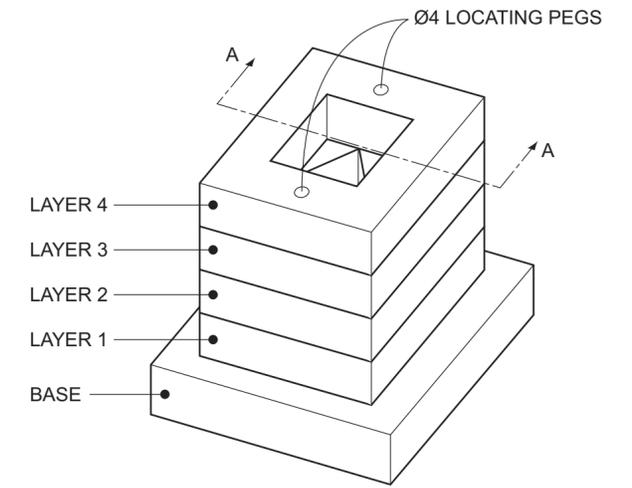
(e) Add appropriate colour and labels to complete the 1:200 illustration of the play area. [6]



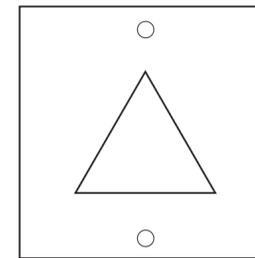
Question 4

A sketch of a puzzle is shown on the right. The puzzle is made from 4 layers of 10 mm thick acrylic that stack on a base. The layers are located in position on the 10 mm thick base by pegs. Each of the layers has a geometric shape cut out of the centre.

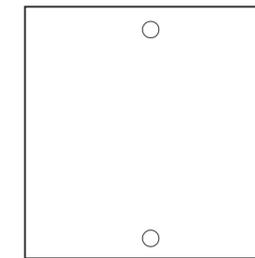
(a) Complete the full size drawing of each of the layers by adding the missing geometric shape. Each shape is in the centre of the layer. Layer 3 has been completed for you. [9]



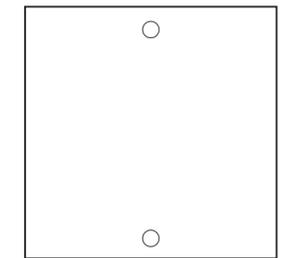
Layer 4 - 20 mm square



Layer 3 - Equilateral triangle length of side 20 mm

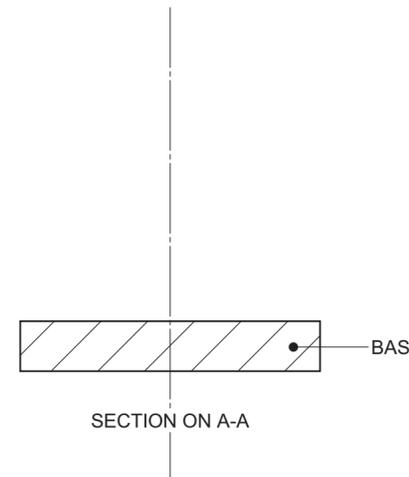


Layer 2 - Octagon circumscribing a 25 mm diameter circle



Layer 1 - Hexagon length of side 12 mm

(b) In the space below complete a full size sectional drawing of the assembled puzzle. The section is to be taken through the cutting plane A-A as indicated on the sketch above. [12]



(c) Produce an exploded pictorial sketch of the puzzle showing the base, location pegs and layer 4. Do not show layers 1, 2 or 3. [12]

[Turn over

SHEET 2 OF 2 (SECTION 2)

Print your surname, other names, Centre number and candidate number in the spaces provided.

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Question 5

A flower growing business called A, P & N has produced the table below to show the quarterly sales figures for two types of flower that were supplied to a supermarket during the last year.

	Red	Yellow
1st quarter Jan - Mar	7000	10 050
2nd quarter Apr - Jun	5750	9400
3rd quarter July - Sept	3250	6200
4th quarter Oct - Dec	9550	6900
Total	25 550	32 550

(a) The flower growing business wishes to show these figures in the form of a bar chart on the given axes to the right. The bar chart must:

- (i) show the quarters of the year horizontally and the number of flowers sold vertically;
- (ii) use red and yellow to show the two type of flower;
- (iii) have the quantity added to each bar.

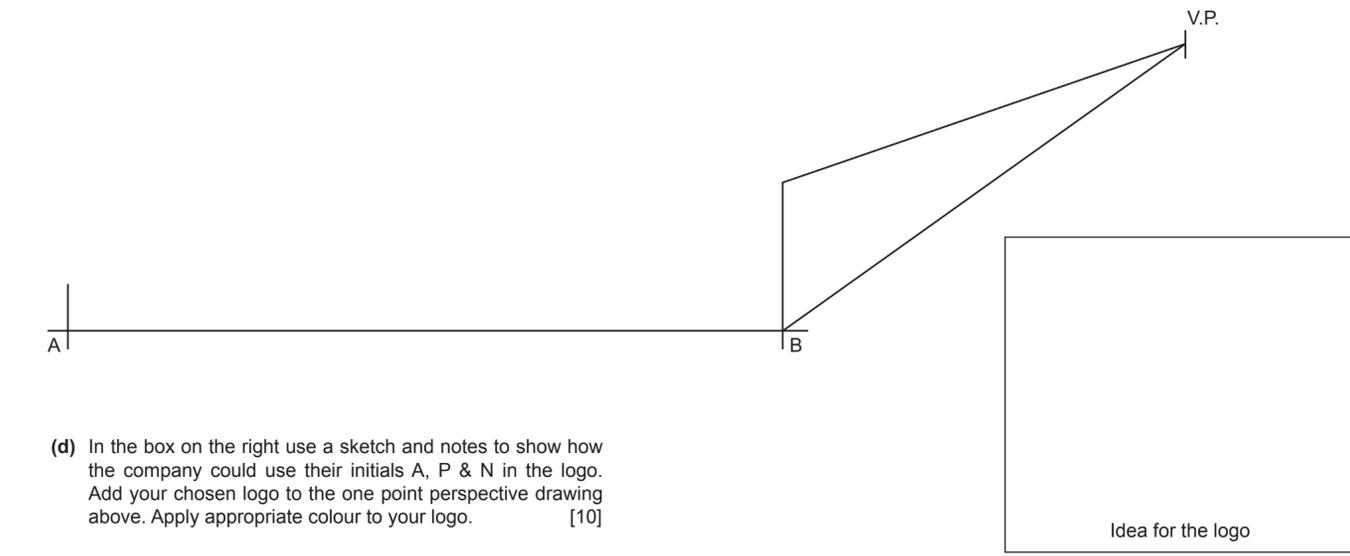
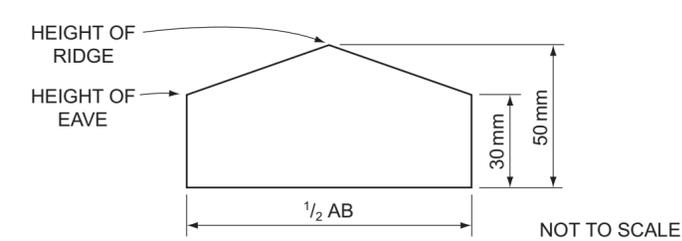
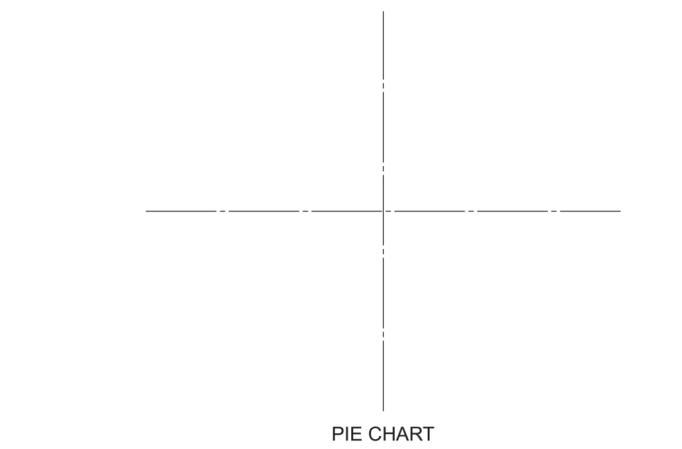
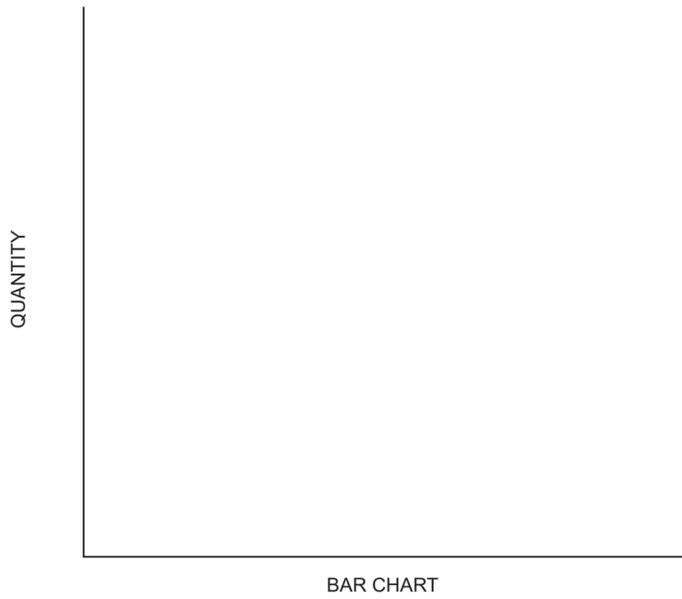
Complete the bar chart on the given axes on the right. [8]

During the same year a pack of mixed coloured flowers was also supplied to the supermarket. Sales of this product totalled 13 900 in the year.

(b) On the centre lines provided draw a pie chart to illustrate the quantity of the three types of flower supplied to the supermarket during the year. Colour code your chart and use appropriate labels. [7]

To produce flowers throughout the year they have to be grown in glasshouses. Each block of glasshouses has 2 spans. The height of the eaves and ridge of each span is given in the small sketch on the right. A drawing of a glasshouse block is to be used as part of a company logo.

(c) Complete the one point perspective drawing of the glasshouse block. The two spans are to be drawn on the given horizontal line AB. The vanishing point (VP) is also given. [7]

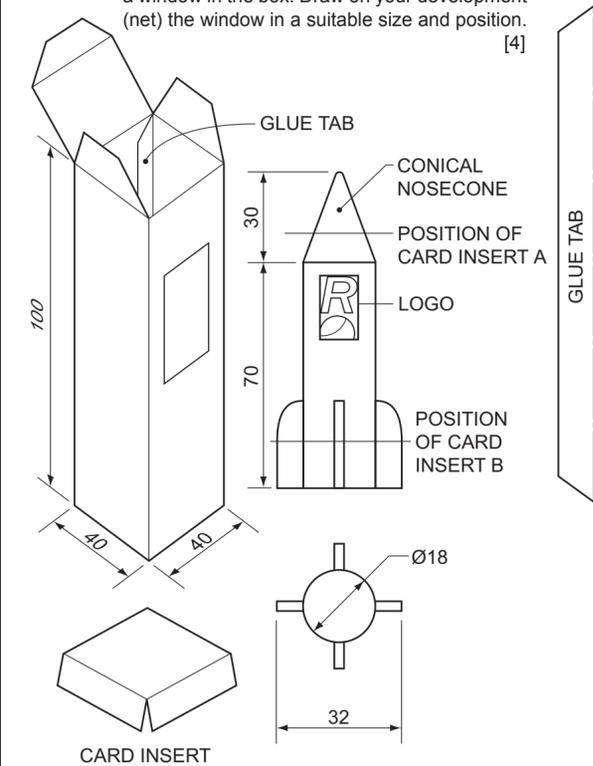


(d) In the box on the right use a sketch and notes to show how the company could use their initials A, P & N in the logo. Add your chosen logo to the one point perspective drawing above. Apply appropriate colour to your logo. [10]

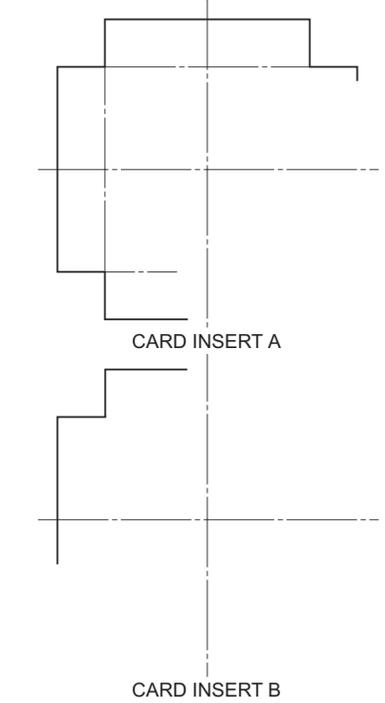
Question 6

A drawing of a toy rocket and package are shown below. The main sizes are given. Use your judgement to determine any sizes not given.

- (a) In the space provided complete the full size drawing of the one piece development (net) of the packaging for the rocket. Clearly show all fold lines, glue tabs and fold-in flaps. [16]
- (b) A logo on the toy rocket is to be visible through a window in the box. Draw on your development (net) the window in a suitable size and position. [4]



(c) The package includes two card inserts that prevent the rocket from moving in the box. These are positioned at levels A and B. Complete the drawings of the card inserts in the space below. [9]



(d) The package for the toy rocket is to be hung on a display rack in shops. A drawing of part of the display rack is shown below. Use sketches and notes to show how the original net could be modified to allow it to be hung on the display rack. [4]

