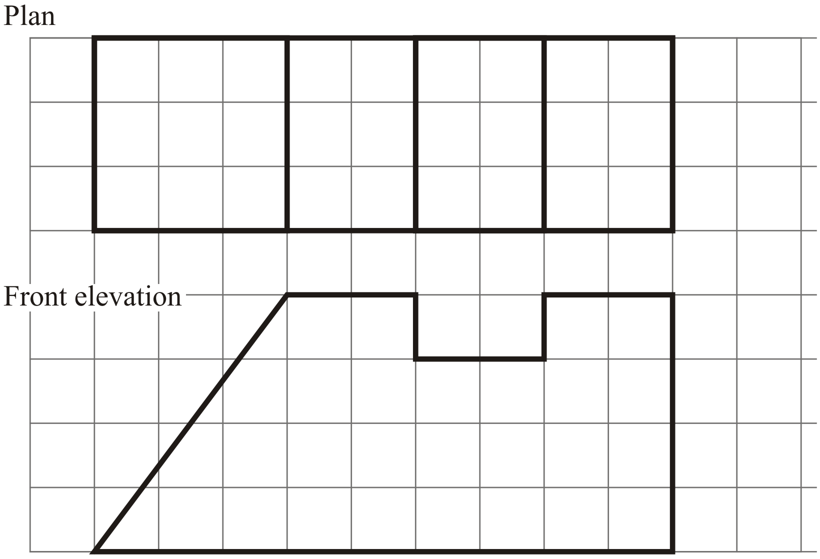
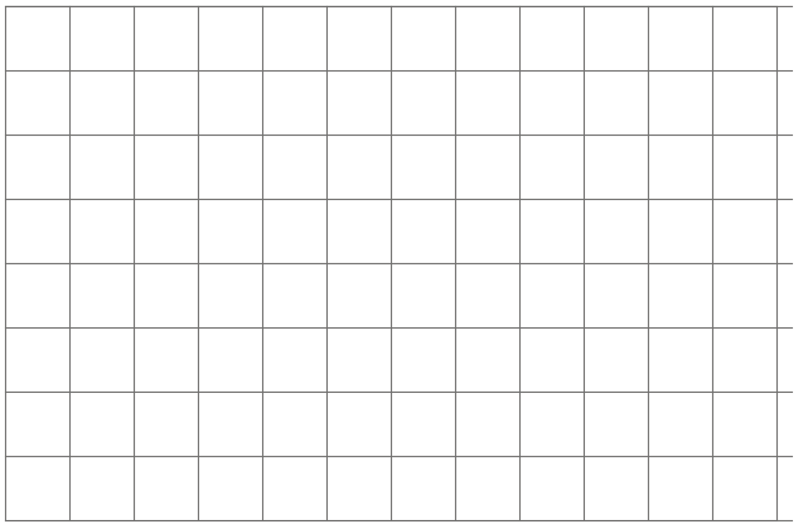
1. Here are the plan and front elevation of a prism.
The front elevation shows the cross section of the prism.



(a) On the grid below, draw a side elevation of the prism.

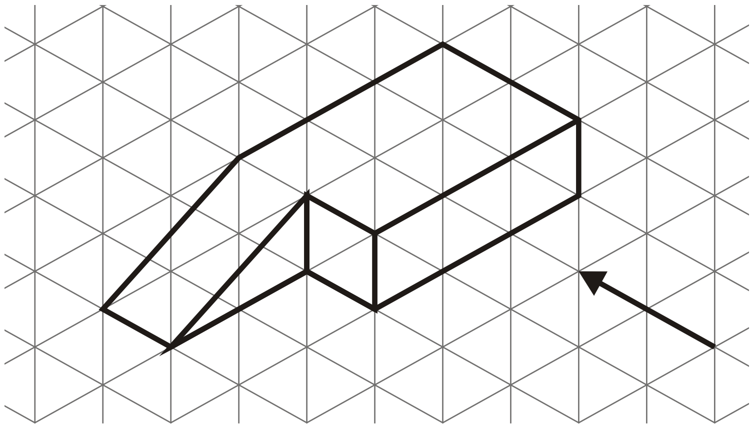


(3)

(b) In the space below, draw a 3-D sketch of the prism.

(2)
(Total 5 marks)

2. The diagram shows a solid object.



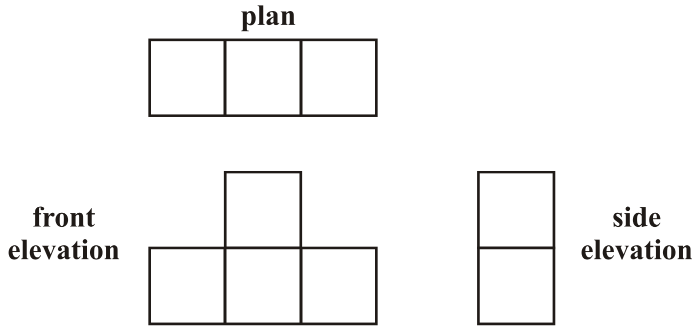
(a) In the space below, sketch the front elevation from the direction marked with an arrow.

(2)

(b) In the space below, sketch the plan of the solid object.

(2)
(Total 4 marks)

3. Here are the plan, front elevation and side elevation of a 3-D shape.



In the space below, draw a sketch of the 3-D shape.

(Total 2 marks)

4.

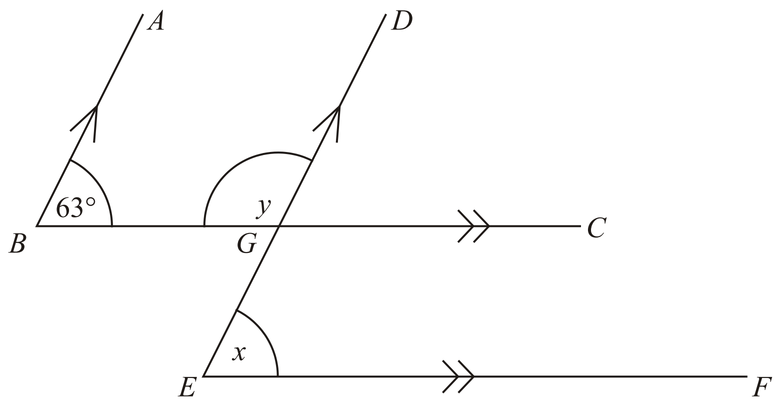


Diagram **NOT** accurately drawn

BA is parallel to *EGD*.
BGC is parallel to *EF*.
Angle *ABC* = 63°.

(a) (i) Find the size of angle *x*.

....

(ii) Give a reason for your answer.

....

....

(2)

(b) Work out the size of angle *y*.

....

(1)
(Total 3 marks)

5.

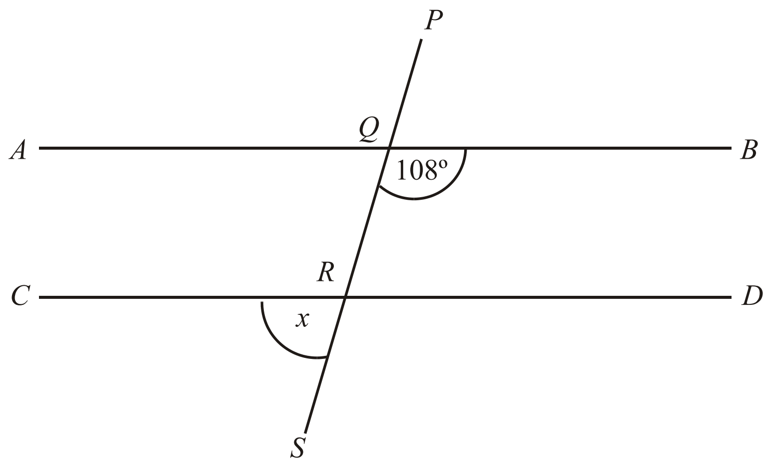


Diagram **NOT** accurately drawn

AB is parallel to *CD*.

Explain why angle x is 72º.

....

....

(Total 2 marks)

6.

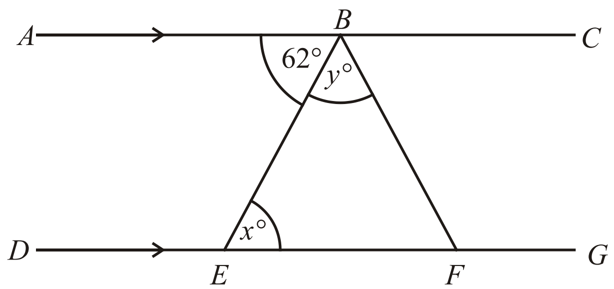


Diagram **NOT** accurately drawn

ABC and *DEFG* are straight lines.
AC is parallel to *DG*.
BE = *BF*.
Angle *ABE* = 62°.

(a) (i) Find the value of *x*.

x = ...

(ii) Give a reason for your answer.

....

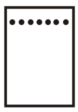
(2)

(b) Work out the value of *y*.

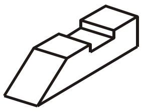
y = ...

(2)

(Total 4 marks)

1. (a)  dotted line
may be solid 3

B2 for rectangle base 3 squares and height 4 squares
(B1 for rectangle with one correct dimension)
B1 for horizontal line 1 cm from top)
SC B2 for completely correct elevation on its side

(b)  2

B2 for perspective drawing showing slant face and cutout
B1 for perspective drawing with either slant face cutout omitted

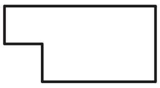
[5]

2. (a)

 2

B1 B1 for correct sketch – ignore additional internal lines
B1 B0 for rectangle or right-angled triangle or correct shape without line
NB 3-D sketch gets B0 B0

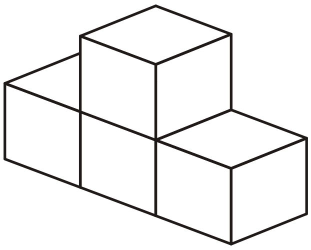
(b)

 2

B1 B1 for correct plan – ignore internal lines –accept a rotated plan, not reflected
B1 B0 for a single rectangle drawn
NB 3-D sketch gets B0 B0

[4]

3. correct drawing 2



B2 Condone hidden detail shown with solid lines and missing lines on front face
(B1 for a correct sketch with other incorrect sketch(es)
or for prism with correct cross section > 1 cube wide
or for attempt to draw prism with correct cross section
or prism with correct plan and side elevation)

[2]

4.	(a)	(i) Angle $x = 63$ 63° *B1 for 63°*	2	
		(ii) (Corresponding angles) and reason *(B1 for corresponding or alternate angles mentioned, accept Z angles or F angles)*		
	(b)	Angle y = 117° *B1 for 117° cao*	1	
				[3]
5.	explain	*B1 for alternate, corresponding or co interior* *B1 for his straight line 180, or vertically opposite*	2	
				[2]
6.	(a)	(i) 62 *B1 cao (look for answers on diagram)*	2	
		(ii) alternate angle *B1 accept z angle*		
	(b)	$180 - 2 \times 62$ 56 *M1 for $180 - 2 \times$ "62"* *A1 ft (look for answers on diagram)*	2	
				[4]

1. Mathematics A

Paper 1

In the first part, a sizeable minority drew a rectangle with the correct dimensions, which earned 2 marks out of 3, but the hidden detail line required for the final mark was rarely present. In the second part, considerable tolerance was exercised by examiners. Some candidates produced excellent drawings but both marks were awarded for a perspective drawing showing the two key features of the sloping face and the cutout, even if there were errors in the drawing. Consequently, a substantial number of candidates received full marks. Sketches of triangular prisms and, to a lesser extent, pyramids appeared regularly but were not rewarded. Interestingly, there was little correlation between candidates' marks on this question, especially the 3-D sketch, and their performance on the paper as a whole.

Paper 3

Reponses to this question were centre-dependent. Most candidates obtained 2 marks for a correctly drawn rectangle outline. It was very rare to see the hidden (usually dashed) line shown. It is hoped that candidates will have greater success once this becomes a more familiar topic. It was encouraging to see the many attempts at the 3-D sketch, most earning full marks. Common errors included a failure to show the depression on both sides of the sketch, or a failure to show a sloping edge. A minority of candidates drew 3-D shapes that failed to relate to the elevation, such as cylinders, triangular prisms or pyramids.

Mathematics B Paper 16

Very many candidates scored well on this question often gaining 4 out of the 5 marks available. In part (a) a correctly positioned rectangle was the usual answer without a dotted line to indicate the hidden detail. Weaker candidates often misunderstood this question and drew a parallelogram or the front elevation or, in some cases, the 3-D sketch required in part (b).
In part (b) most candidates made valiant efforts to sketch the prism and usually gained both marks for showing the sloping face and the cut out.

2. Mathematics A

Paper 2

Only a minority of candidates sketched both views successfully. The front elevation was better understood than the plan and drawn correctly much more often. 3-D drawings or nets appeared regularly as the answer to part (b).

Paper 4

Success on this question was largely centre-based, indicating that in some centres this topic might not have been covered in any depth. 3D diagrams, of which there were many, immediately gained no marks. Success was higher in part (a), probably because the arrow on the diagram gave a strong indication as to what was required. In part (b) there were many attempts at drawing a net, which was clearly incorrect.

Mathematics B

Paper 15

This is a relatively new topic on the foundation syllabus and it was clear that many candidates had no idea of plans and elevations. Most candidates attempted the question, with some degree of success. Those who had no idea of these concepts tried to reproduce the 3-D diagram in both parts, scoring no marks. Others attempted to draw nets for the diagrams. Of those candidates with some idea, many lost marks by drawing a parallelogram instead of a triangle in part (a) and/or by adding an incorrect shape in (b).

Paper 17

In part (a) a correct trapezium was often seen, sometimes without the interior line (which lost a mark). Additional interior lines were condoned and there was no marks lost for incorrect proportion in terms of size of rectangle and triangle.
Part (b) was less well done with a significant number of candidates offering a plan plus all other elevations. Unworkable nets and rectangles with a parallelogram attached were common errors. A number of candidates merely attempted to re-draw the 3-D projection.

3. **Specification A**

Foundation Tier

There were many good attempts with some candidates producing excellent drawings of the solid. Although a sketch was asked for, candidates should be encouraged to use a ruler for this kind of question. Common errors included nets of the solid or of a single cube while some simply drew a cube. Others earned a mark for a prism with the correct cross-section but the wrong depth, usually 2 cubes. It was noticeable that some of the incorrect solids had more than four cubes.

Intermediate Tier

Most candidates gained at least one mark for a 3D drawing, with many gaining both marks. A significant number spoilt their drawing in some way, sometimes by adding far too many lines or cubes, or by giving a diagram that was illegible. The main error was in giving an elongated shape with a correct cross-section.

Specification B

Foundation Tier

Drawing a 3-D sketch did not always appear to have been previously experienced by the candidates with many single cubes drawn or nets of cubes. Candidates were obviously engaged by this task and the sheer variety of answers highlights the fact that many students find it difficult to present 3-D sketching with real accuracy. Compliments, on the other hand, must go to those candidates whose drawings had the precision of computer graphics including shading and elevations labelled. Nearly half the candidates were able to score at least one mark by drawing a 3-D shape that either had a correct plan and side elevation or that had the front elevation correctly drawn but went back too far or had a minor error with over 25% of the candidates scoring both available marks.

Intermediate Tier

The majority of candidates realised the nature of the 3-dimensional shape, however there were a variety of levels of success in sketching it. Some candidates correctly sketched the cross-section but their prisms were often of depth 3 cubes, reflecting their misunderstanding of the plan. Attempts at a 3-dimensional sketch of the correct prism usually gained at least one mark.

4. Foundation Tier

Candidates could often give the correct answer for (a) (i) but it was extremely rare to find a correct reason for their answer. Many realised it was to do with parallel lines but rarely was the correct reason given. Many candidates stated they had used a protractor, or even a compass. This was even more worrying as it often demonstrated their inability to measure correctly. Some judged the size compared with angle ABC (usually as a bit smaller) or a right angle. Part (b) was also poorly answered.

Intermediate Tier

More than 85% of candidates found the correct size of angle x in part (a) but only a fifth of these went on to give a correct reason. Too few candidates mentioned corresponding or alternate angles and many explanations focused on parallel lines or even parallel angles.

5. Nearly all candidates found it too complex to explain why angle x was 72° although a good number knew that it was something to do with 180° and/or a straight line. Few candidates identified which angles on the diagram were involved in their explanation.

6. Candidates understood what was expected of them in this question but although 35% were able to give the correct answer in part (a) only 11% of candidates were able to give the correct reason. Many candidates used the correct nomenclature often we had Z angles and alternating or alteration or in part (b) about 35% of candidates were able to calculate the missing angle in the isosceles triangle.