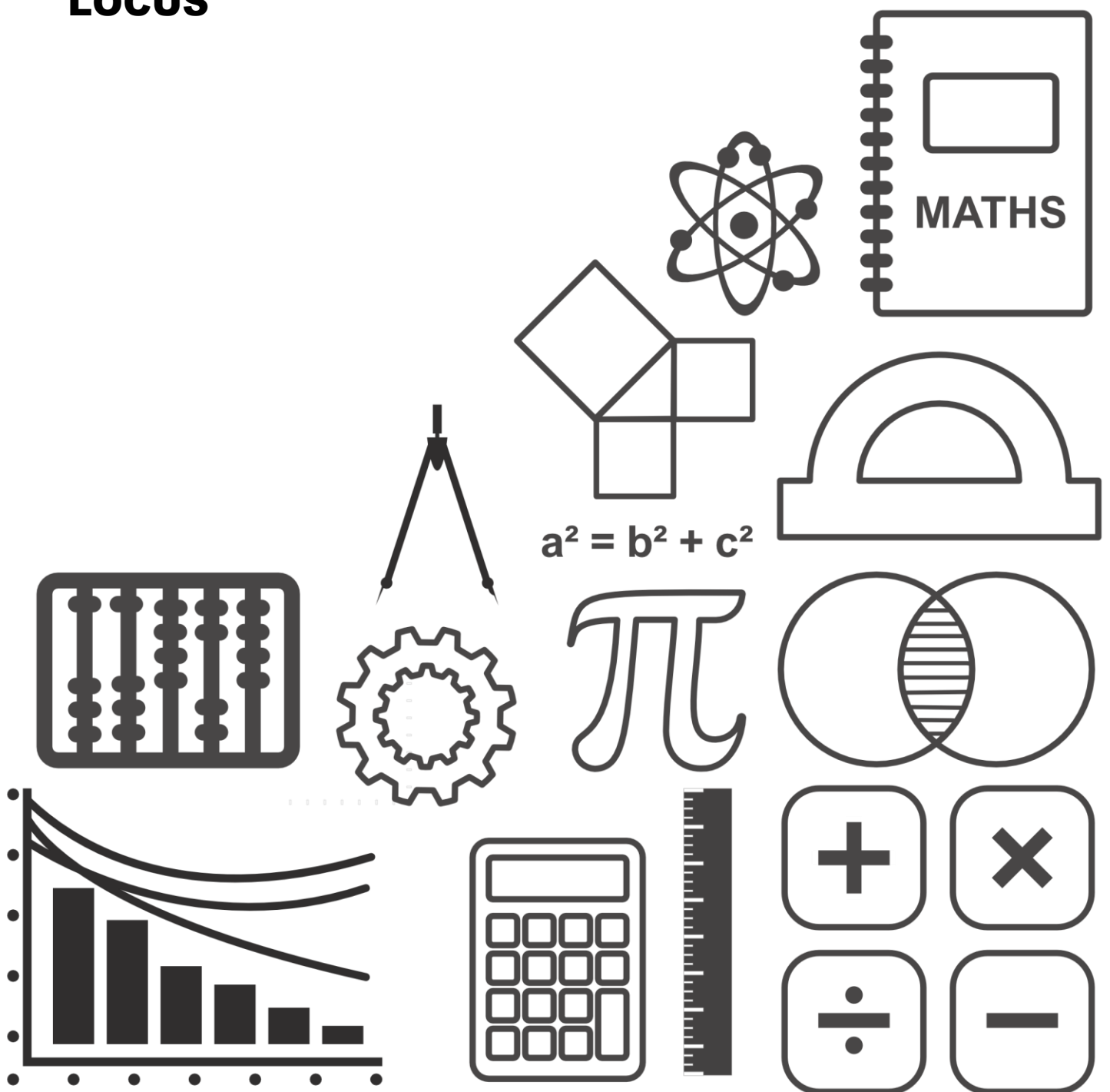


GCSE TOPIC BOOKLET LOCUS



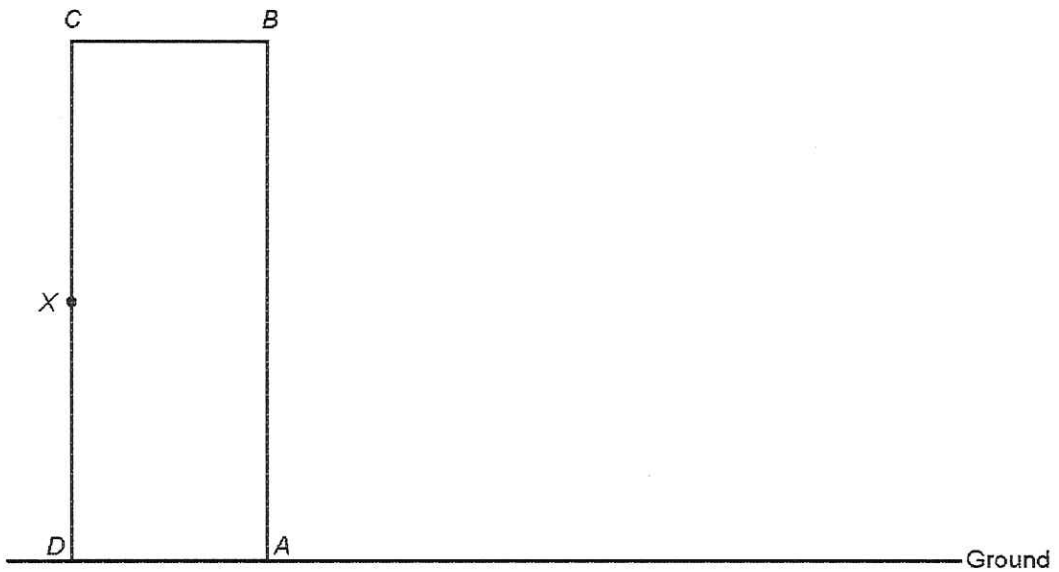
1.

$ABCD$ represents a rectangular side of a box.

X is the midpoint of the edge CD .

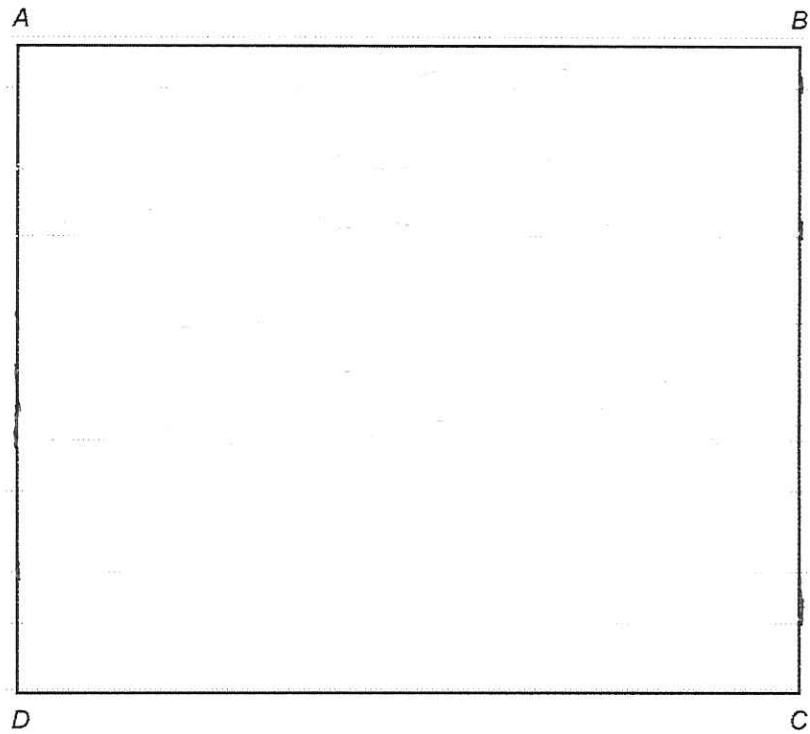
The box is rotated clockwise about point A until B comes into contact with the ground.

Accurately draw the new position of $ABCD$ and the locus of the point X as the box rotates about A . [3]



2.

The diagram shows rectangle $ABCD$.



Indicate the region that is inside the rectangle $ABCD$ and is also:

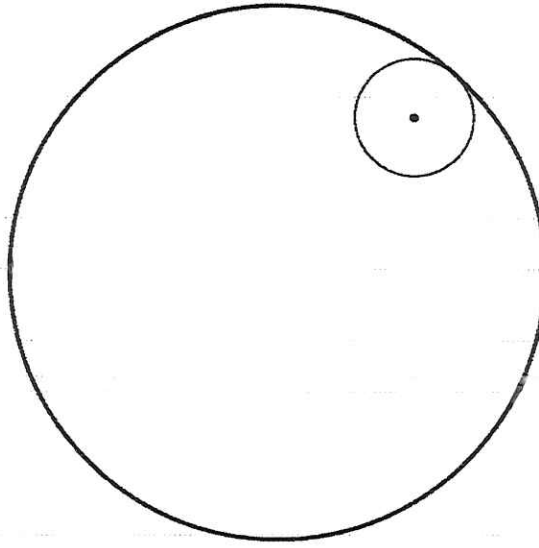
- closer to point C than to point B ,
- closer to line AD than to line AB ,
- more than 6 cm from point D .

[4]

3.

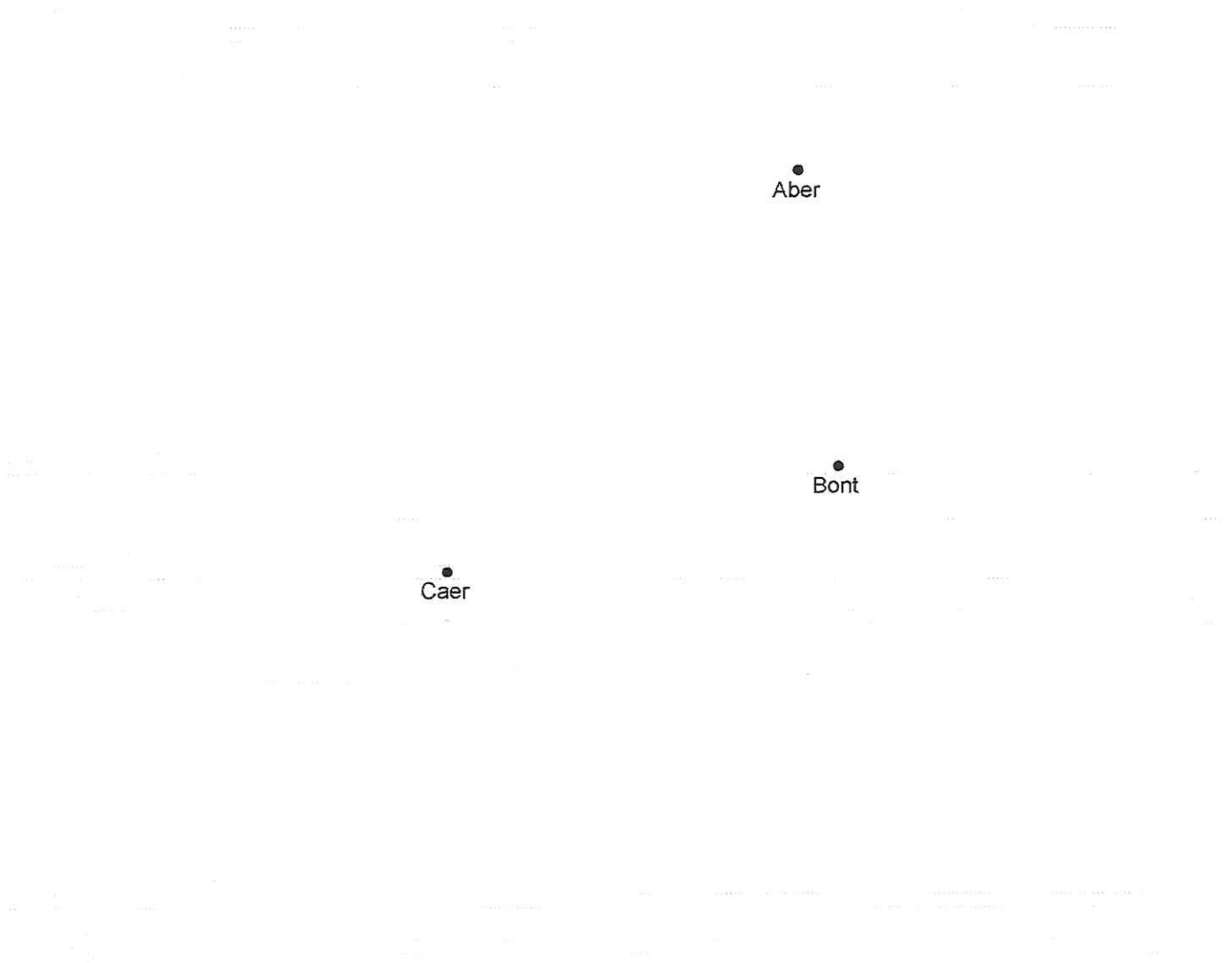
The diagram shows a coin inside a large circular ring.
 The centre of the coin is shown.
 The coin is rolled around the inside of the ring, so that it is always in contact with the ring.
 Sketch the locus of the centre of the coin as it is rolled around the inside of the ring.

[2]



4.

Leah is drawing a map of her local area. She has accurately plotted the positions of the villages of Caer, Aber and Bont on the map below.
 Leah now wants to plot the position of her house.
 Her house is the same distance from Aber as it is from Bont.
 According to the scale she is using, it needs to be plotted 6 cm from Caer.
 Find the two possible positions of Leah's house, and mark each with a cross. [3]



5.

A Youth Hostel (H) is situated on the shore of a lake as shown below.

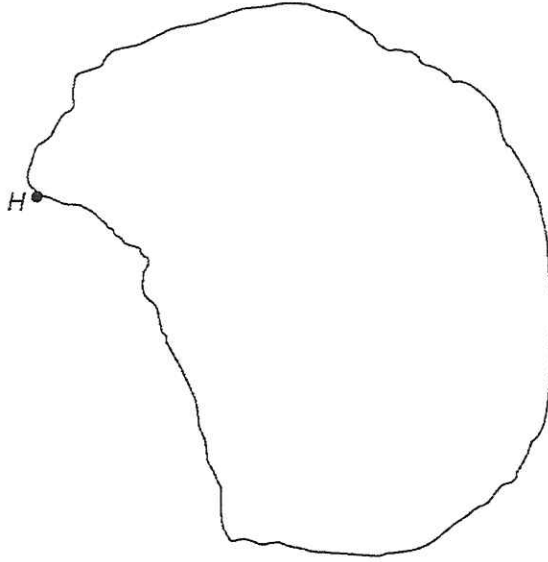
Two points, A and B , are also on the shore of the lake.
Both points are 150 metres from H , and A is further north than B .

(a) (i) Using a scale of,

1 cm represents 25 metres,

clearly mark with dots (•) the position of point A and the position of point B . [2]

N
↑



(ii) What is the actual distance between point A and point B straight across the lake? [2]

.....

.....

(b) Steve rows in a straight line from H to point A .
At point A he turns and rows in a straight line from point A to point B .

Use your protractor to measure the obtuse angle he turns through at point A . [2]

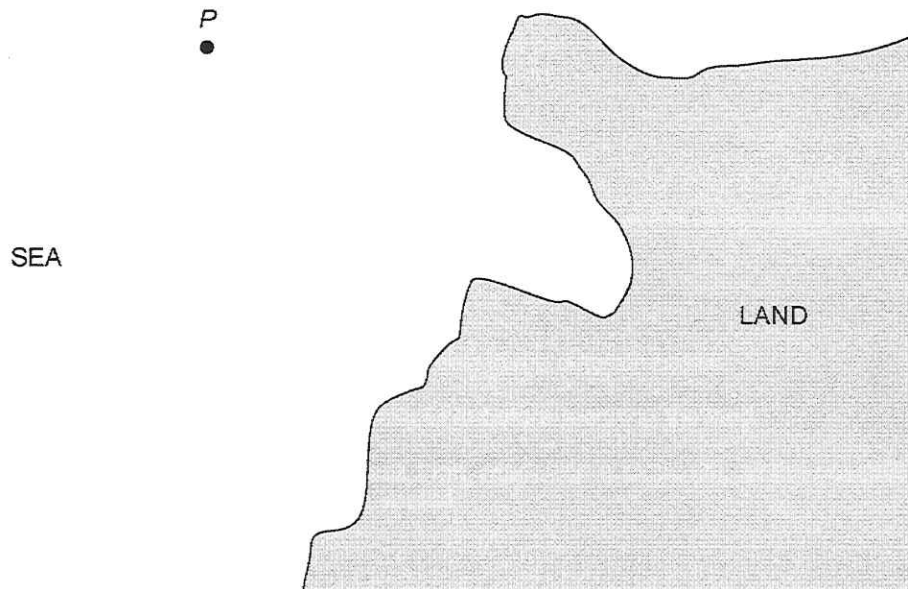
Obtuse angle turned through = °

6.

A boat was out at sea at point P , as shown in the diagram below.

It sailed in a **straight line** for exactly 6 km before reaching the land.

Using a scale of **1 cm to represent 1 km**, mark with a cross (X), all the possible points on the shore where the boat could have landed. [3]



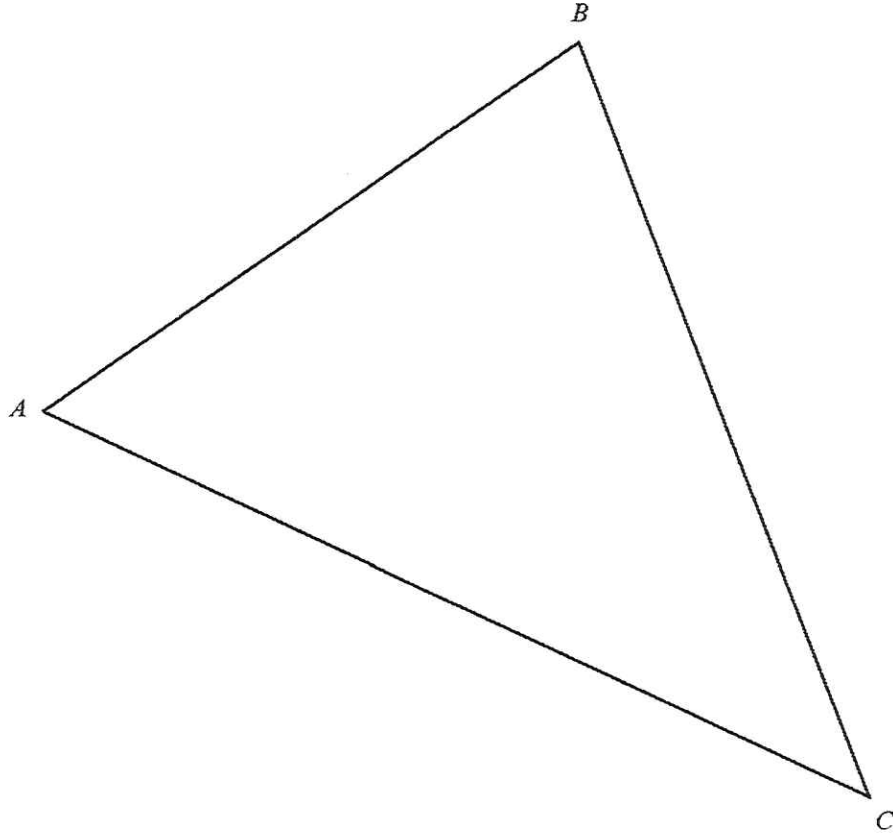
7.

- (a) A region is found within triangle ABC using the following criteria.
Points in the region are:

- nearer to B than to C ,
- greater than 4 cm from A .

Shade this region in the triangle ABC .

[3]



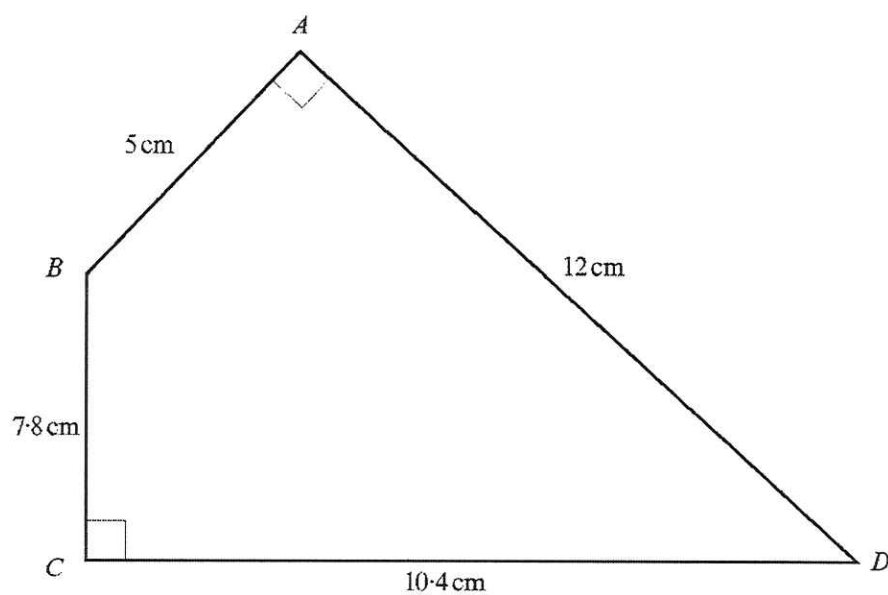


Diagram not drawn to scale

[illegible]

[5]

8.

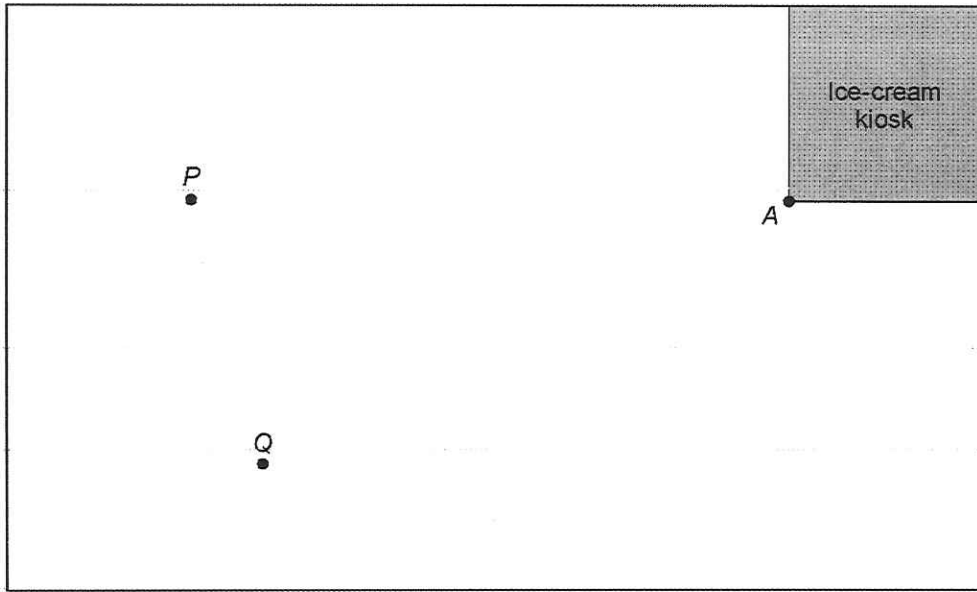
Fisher Tours has a new coach.



- (a) On Sunday, the coach took 45 passengers on a trip to the zoo. The ratio of men to women to children was 2 : 3 : 4. How many children were on the coach?

[2]

- (b) When *Fisher Tours* takes a coach trip to the zoo they must follow instructions for parking. An accurate scale drawing of the entire coach-parking zone at the zoo is shown below. *Fisher Tours* has been allocated a parking area within this parking zone.



Scale: 1 cm represents 4 metres

The instructions for parking are as follows:

- Must be further than 12 metres away from point A at the ice-cream kiosk.
- Must be closer to the lamp post Q than to lamp post P.

Indicate, on the scale drawing above, the region in which *Fisher Tours* can park their coach.

[3]

MacReardon Construction is contracted to work on a warehouse site where there are a number of liquid storage tanks.



A sketch of the base of one of the liquid storage tanks is shown below.

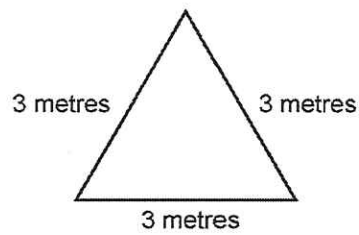


Diagram not drawn to scale

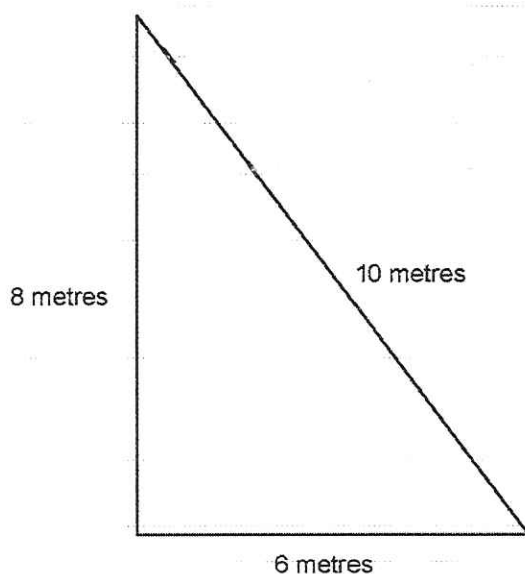
- (a) Use a pair of compasses and a ruler to make an accurate scale drawing of the base shown above.
Use a scale of **2 cm to represent 1 metre**. [3]

- (b) *MacReardon Construction* has been asked to lay a drain surrounding a different liquid storage tank. The drain must be exactly **2 metres** away from the perimeter of the base of the tank.

An accurate scale drawing of the base of this tank is shown below.

A scale of **1 cm to represent 1 metre** has been used.

On the scale drawing below, draw accurately the position of the drain surrounding the tank. [3]



10.

Shade the region, inside the trapezium below, that satisfies both of the following conditions:

- It is closer to A than to B .
- It is less than 5 cm from B .

[3]

