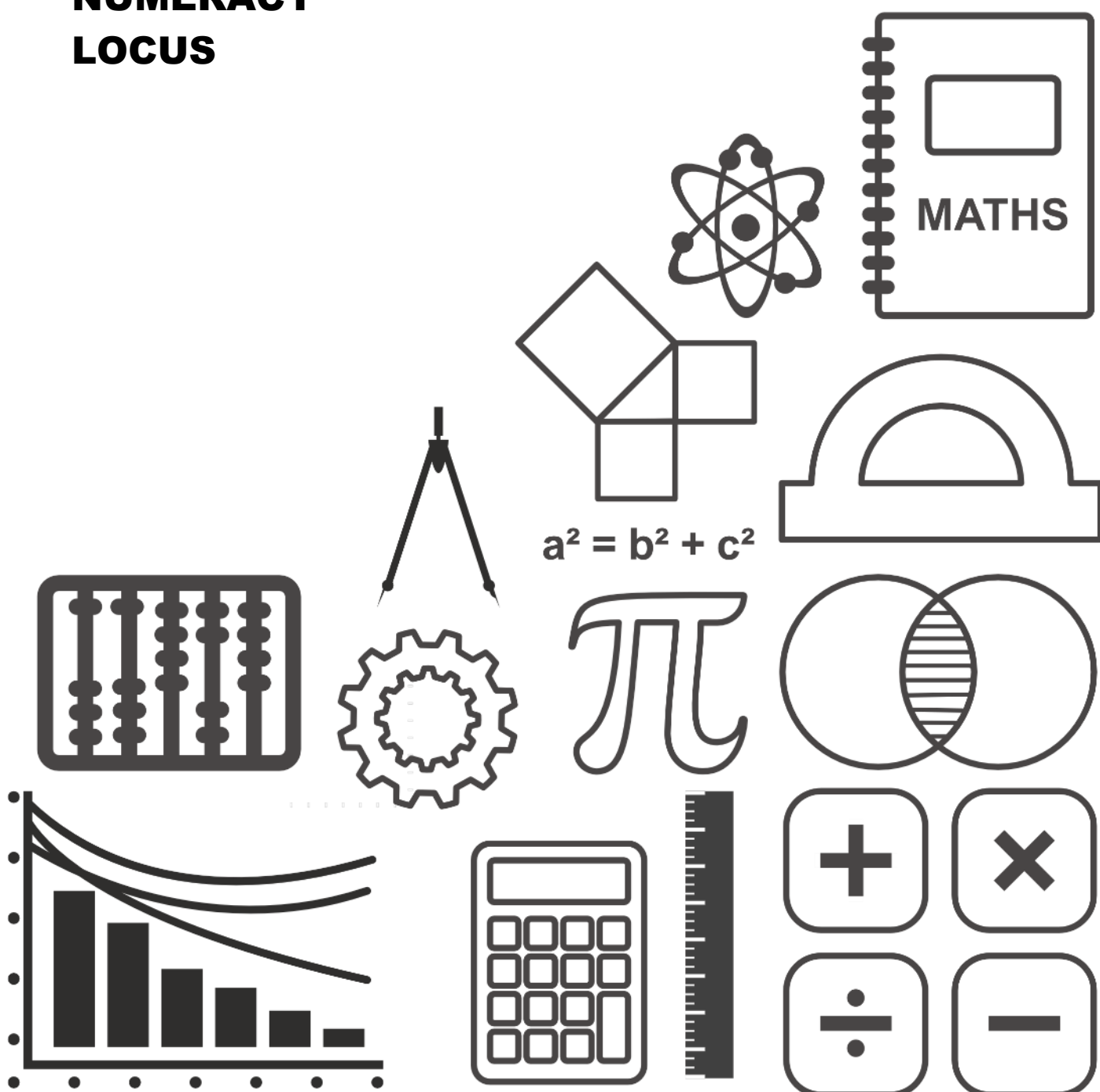


MATHSDIY

GCSE TOPIC BOOKLET NUMERACY LOCUS



1.

The scale diagram below shows Haydn's garden.

His garden is 27 metres long and 18 metres wide.
The scale used is **1 cm represents 3 metres**.

Haydn is planting a tree in his garden.

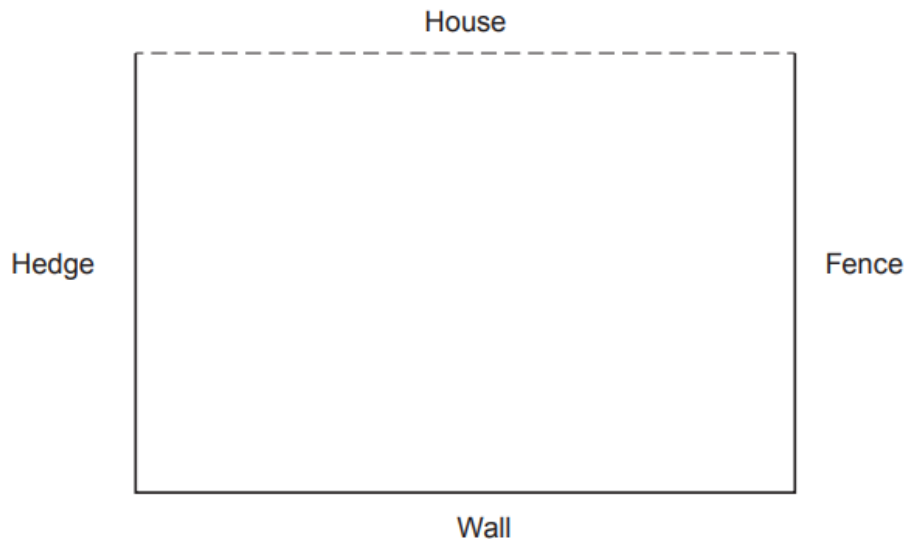
He decides that the tree must be planted:

- 15 metres from the fence,
- equidistant from the house and the fence.

Draw suitable lines on the diagram and show where Haydn should plant the tree.

[3]

1 cm represents 3 metres



2. The map below shows the placement of four wind turbines, and a road connecting two of the turbines.



A new wind turbine, Efail, is to be built.

It is to be placed

- on the road connecting Bryn turbine and Cwm turbine, and
- on the perpendicular from Aber turbine to the road.

The map is drawn using a scale of **2 cm represents 1 km**.

How far will Efail turbine be from Dŵr turbine?

You **must** use constructions to answer this question, using **only a pair of compasses and a ruler**. [4]

Scale 2 cm represents 1 km

- Aber turbine



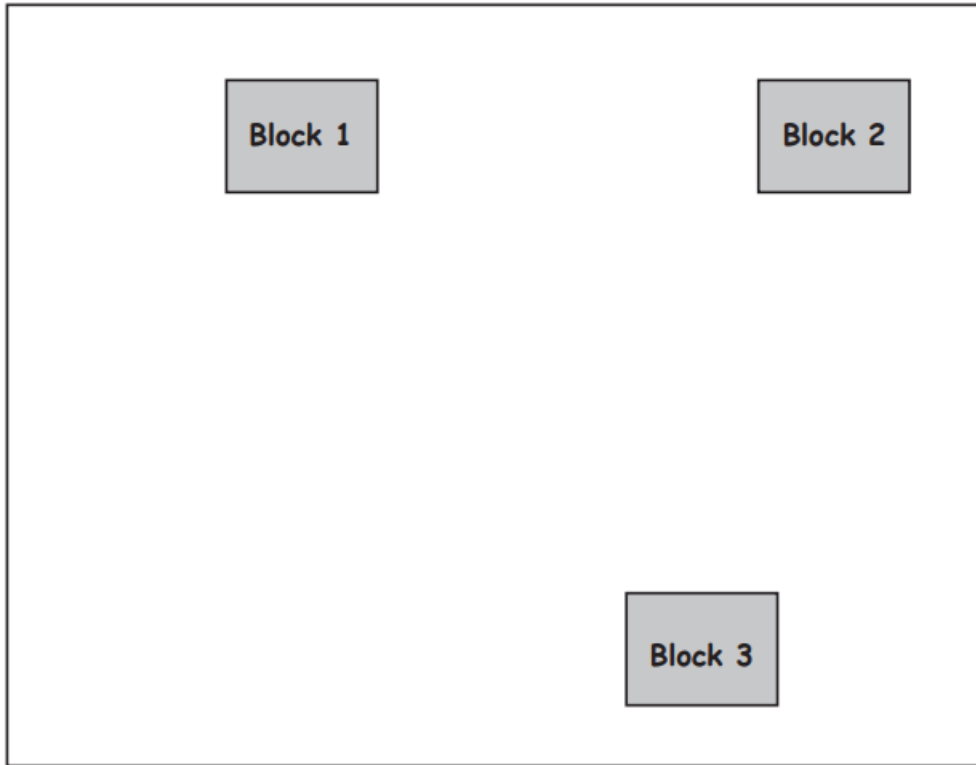
•
Dŵr turbine

.....
.....

Distance is km

3. A builder has drawn a plan for building 3 office blocks on a plot of land. They are numbered 1, 2 and 3, as shown below.

The scale of the plan is **1 cm represents 20 m**.



- (a) The builder is planning to plant a tree so that it is:
- the same distance from Block 1 as it is from Block 2,
 - 80 metres from the top left hand corner of Block 3.

Mark the position for the planting of the tree. [3]

.....

- (b) What is the shortest possible distance between Block 2 and Block 3? [1]

.....

.....

..... metres

4.

The diagram below shows a sketch of the existing gas pipes that run to and from Tŷ Gwyn. It also shows a proposed 180 m gas pipe which is to be laid to provide gas to Cae Nia. The proposed pipe bisects the angle formed by the existing pipes at Tŷ Gwyn.

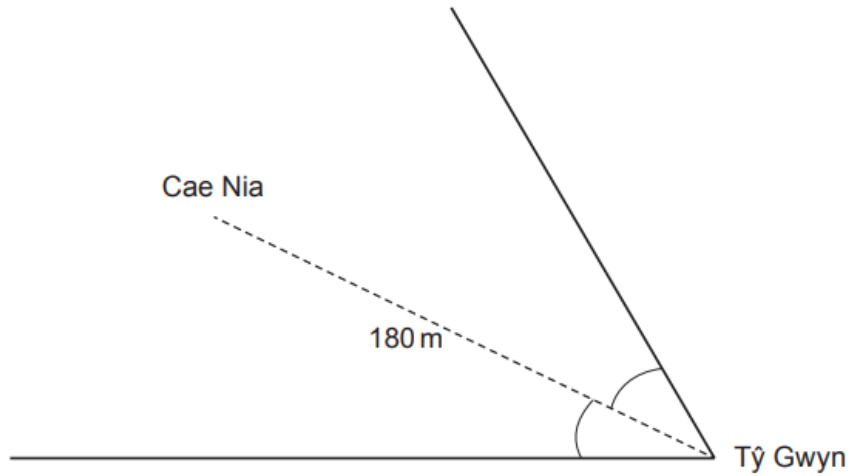


Diagram not drawn to scale

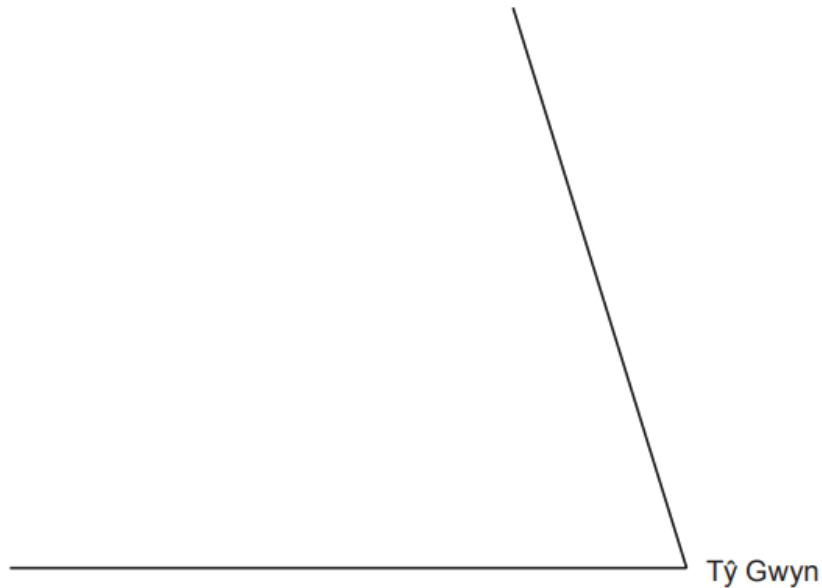
Complete the scale drawing below to show the proposed pipe.

- You must use a pair of compasses to construct the angle bisector.
- Use a scale of 1 cm to represent 20 metres.

[3]

.....

.....



5. The scale diagram opposite shows an Eisteddfod camping field.
The camping field is 100 metres long and 80 metres wide.

A river runs along the side *AB*.
There is a hedge along *AD*.
There is a fence along *BC*.
DC is an opening with access to the Eisteddfod camping field.

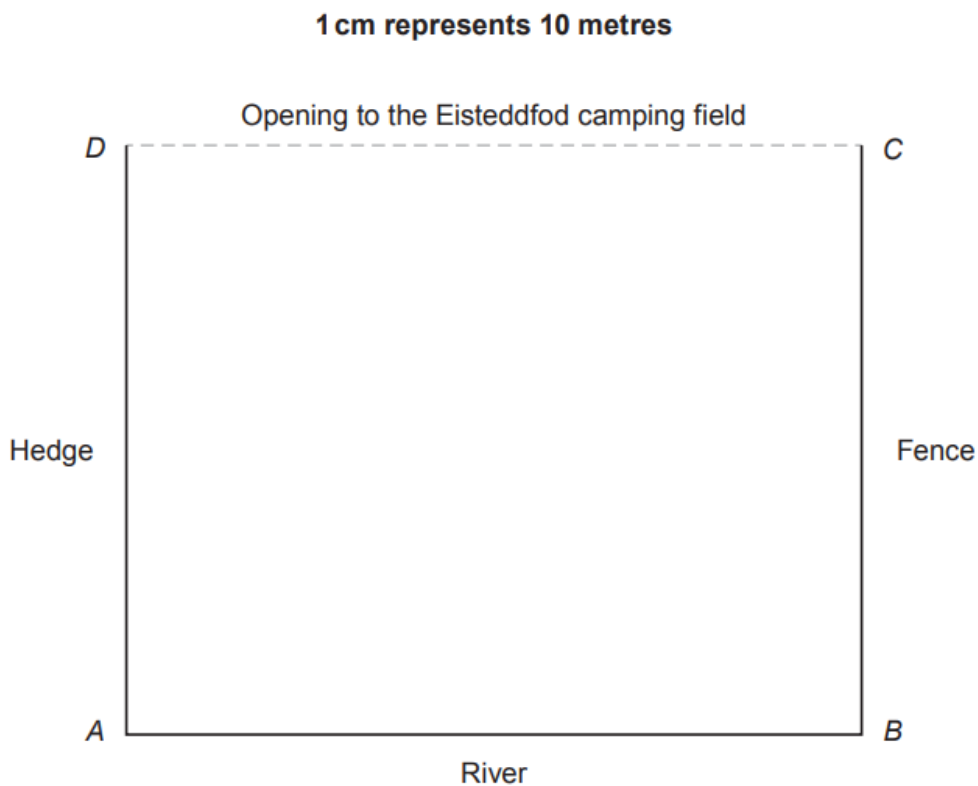
The scale used is **1 cm represents 10 metres**.

A barbecue area is to be built on the camping field.

The barbecue area must be

- nearer to the river than to the opening to the Eisteddfod camping field,
- nearer to the river than to the hedge,
- more than 30 metres from the corner of the field where the hedge meets the river.

Draw suitable lines on the diagram and shade the region where the barbecue area could be built. [5]



6. *Organics4U* is planning to have its headquarters in Wales. The manager has instructed Ffion to look for a site for the headquarters.

Here are the instructions that Ffion has been given by her manager.

'Find the point that is

- an equal distance between *Wrexham* and *Aberporth*, and
- an equal distance between *Caernarfon* and *Swansea*.

The new headquarters needs to be within 20 miles of this point.'

On the map below, shade the region, **in Wales**, that Ffion should identify for her manager. [4]



7. Bronwen and Alvaro decide to keep some alpacas on their farm in Patagonia.



Bronwen decides to place a cylindrical water container in the small paddock on the farm.



The water container has a diameter of 1.4 metres.

- (i) The scale diagram opposite shows the small paddock on the farm. The small paddock is rectangular, measuring 7 metres by 5 metres.

Scale 2 cm represents 1 m



Bronwen decides to place the centre of the water container so that it is:

- equidistant from the south fence and the east fence,
- 3 metres from the south fence.

Show the placement of the water container on the scale diagram of the small paddock above.

Your diagram should include an **accurate plan view** of the **water container**. [4]