

GCSE Maths homework sheet (higher)

Week 10

Remember that you should do the foundation homework sheet as well.

Diagrams and images on this sheet **are not accurately drawn**

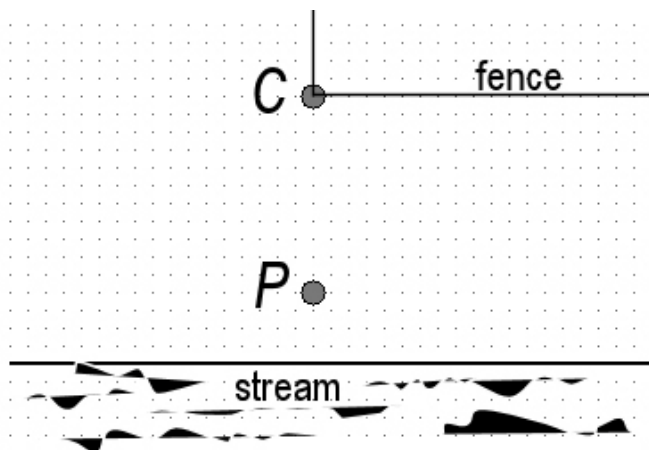
1. The diagram on the right illustrates this question.

A goat is tethered to a post, marked with the letter P , by a rope.

The rope is 5m long.

The post is 3m from a stream.

A fence runs parallel to the stream, 7m away from its bank, until it reaches the point marked C , then turns and runs away from the stream in a direction perpendicular to its bank. The line PC is also perpendicular to the stream bank.



Using 15mm on your paper to represent every 1m on

the ground, construct an accurate locus showing the limits of the area where the goat is able to graze. (5)

2. Three mobile radio masts are located at positions P , Q and R .

Mast R is exactly east of mast Q , and mast P is somewhere north of both. The distances between the masts are:

$$\overline{PQ} = 6 \text{ km}$$

$$\overline{QR} = 10 \text{ km}$$

$$\overline{RP} = 5 \text{ km}$$

- a. Construct an accurate diagram to show this information. (2)

- b. Police receive and emergency call from a small child. The child doesn't know where she is, but reports that her father is ill. The mobile phone company is able to establish that the child's phone is equally distant from masts Q and R , and is 2 km from mast P .

Using a scale of 1 cm on your diagram to represent 1 km on the ground, construct two loci to find the child's possible locations on the diagram and mark each of them with a letter C . (3)

- c. By the time the police reach the estimated positions, the child and her father have moved. The mobile phone company have now lost the phone's signal, but police estimate that father and child cannot have moved more than 1 km in the time.

Construct loci to show the limits of the areas which the police must now search. (3)

3. A photograph is 9 cm high and 6 cm wide. It is placed in a frame which has a gold line drawn around the photograph such that the line is always exactly 1 cm from the edge of the photograph.

Construct an accurate life-size drawing showing both the edge of the photograph and the gold line around it. (3)