GCSE Maths – Geometry and Measures

Constructions

Worksheet

WORKED SOLUTIONS

This worksheet will show you how to work out different types of construction questions. Each section contains a worked example, a question with hints and then questions for you to work through on your own.

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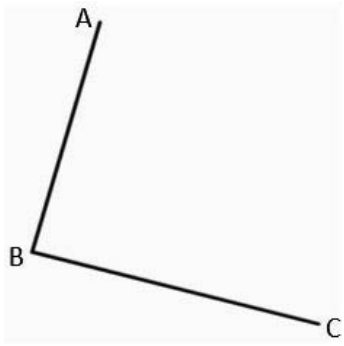
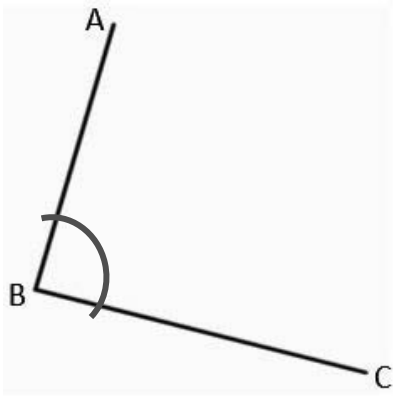
Section A

Worked Example

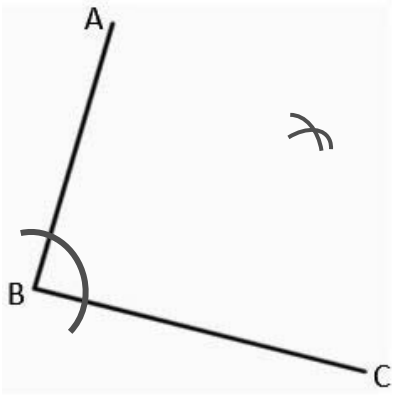
Draw the locus of points that are equidistant from lines AB and BC



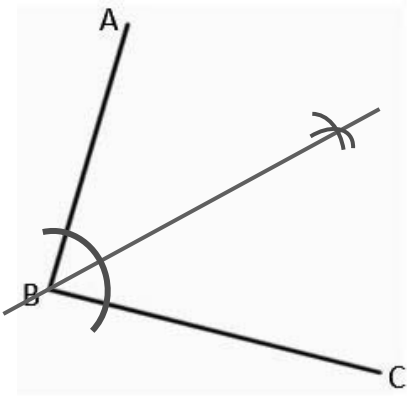
Step 1: Place the compass at B and draw an arc that passes through both the lines AB and BC.



Step 2: Next place the compass at each of the points where the first arc crossed and draw two small arcs which lie in between lines AB and BC.



Step 3: The angle bisector is the line which passes through point B and where the two small arcs cross and this is the locus of points which are equidistant from AB and BC. Join up the part of the two small arcs that cross over one another with the other arc and point B.



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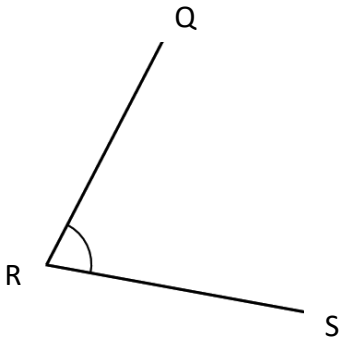
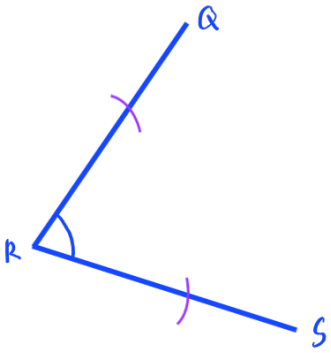
Guided Example

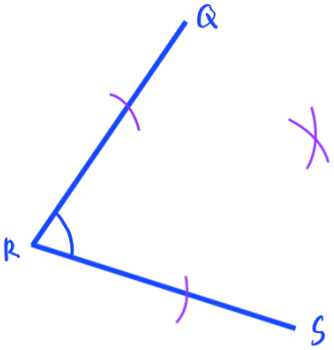
Bisect the angle QRS.



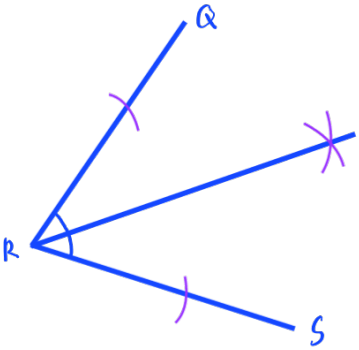
Step 1: Put your compass on the point where the two lines QR and RS meet. Then draw an arc that passes through both QR and RS. Mark the points where your arc crosses the two starting lines.



Step 2: Put your compass on one of the crossing points and draw an arc between the two lines. Repeat this again from the other crossing point and make sure your compass is at the same length as it was before.

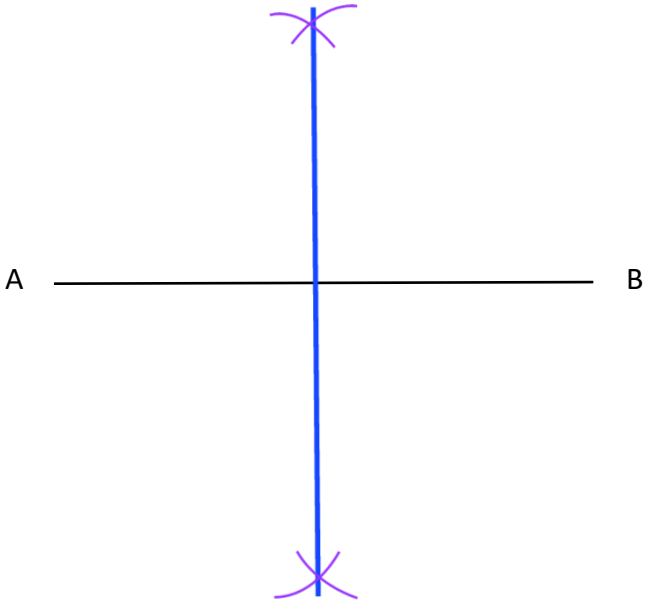


Step 3: Draw a line passing through the point where the two starting lines meet and the point where the two arcs cross.

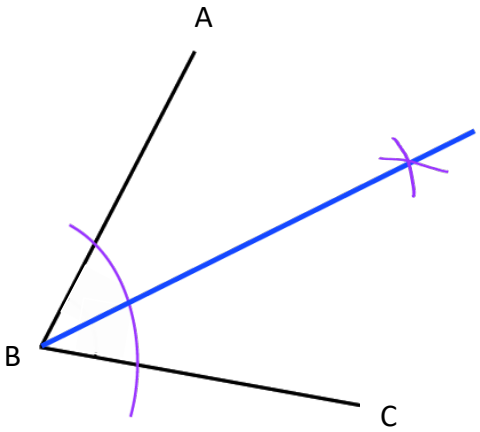


Now it's your turn!
If you get stuck, look back at the worked and guided examples.

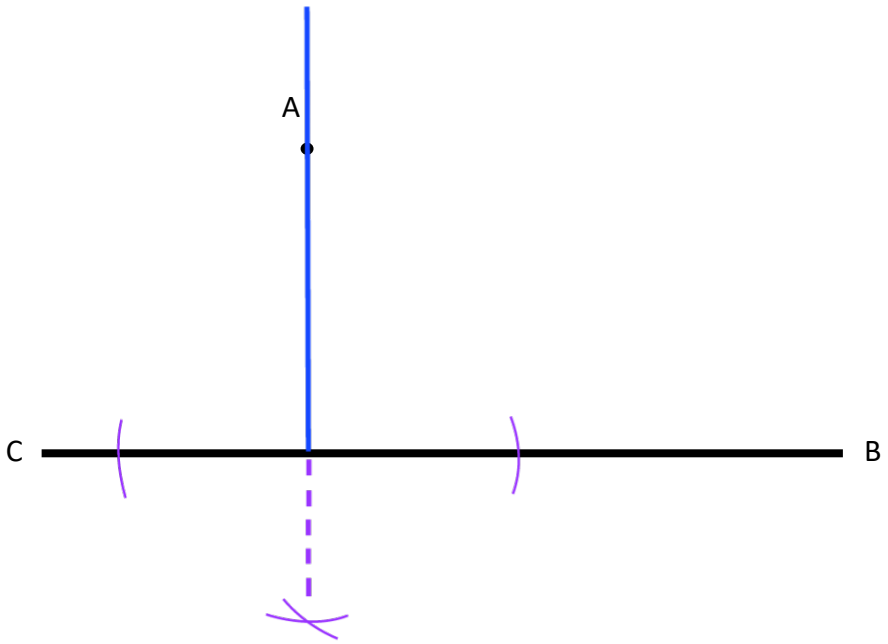
1. Construct the perpendicular bisector of the line AB.



2. Draw the locus of all the points which are equidistant from the lines AB and BC. You must show construction lines.



3. Construct a line starting from point A and ending at line CB. The constructed line should be perpendicular to CB. You must show construction lines.



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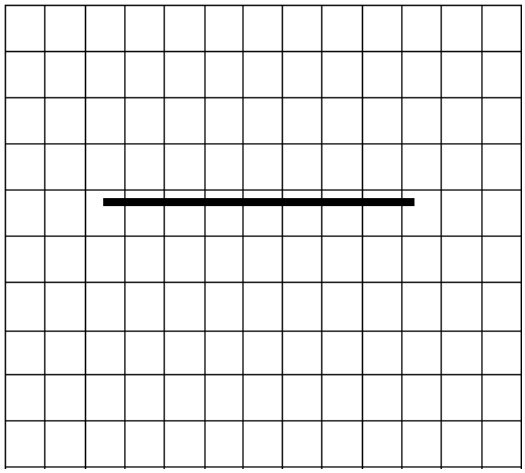
Section B

Worked Example

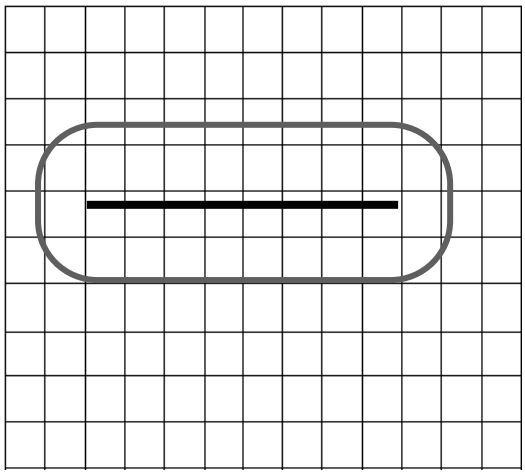
Draw the locus of all points which are 2 cm away from the line below on the grid.



Step 1: To start with, draw the points which are 2 cm above the line using a ruler.

Step 2: Draw the locus of points which are 2 cm below the line using a ruler.

Step 3: Focusing on the left-hand side of the line, place your compass point on the end of the line and place the compass pencil 2 cm away from the end of the line. Join up the two constructed lines with a smooth curve. Repeat for the right-hand side of the line.



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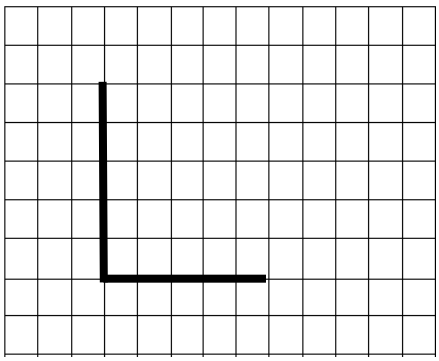
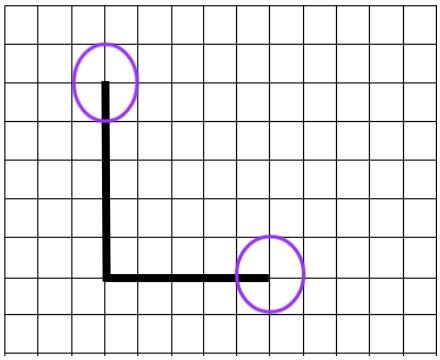
Guided Example

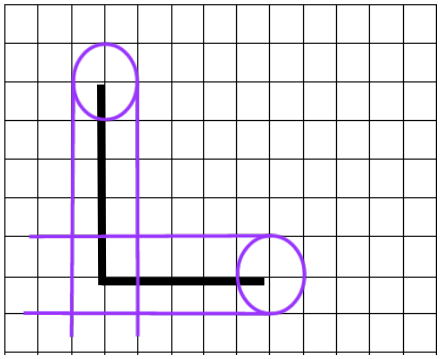
Draw the locus of all points that are 1 cm away from the shape below.



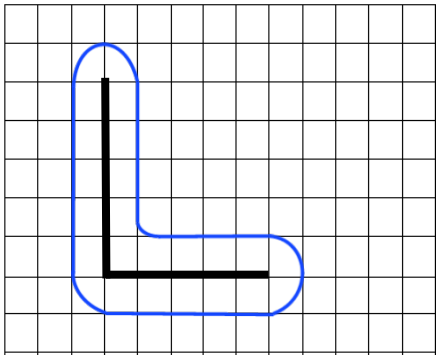
Step 1: To find the locus of points that are 1 cm away from a point (the ends of the lines) draw a circle with radius 1 cm at each point.



Step 2: To find the points that are 1 cm away from a line draw parallel lines that are 1 cm away.



Step 3: Join up the constructed lines and curves with a smooth curve.



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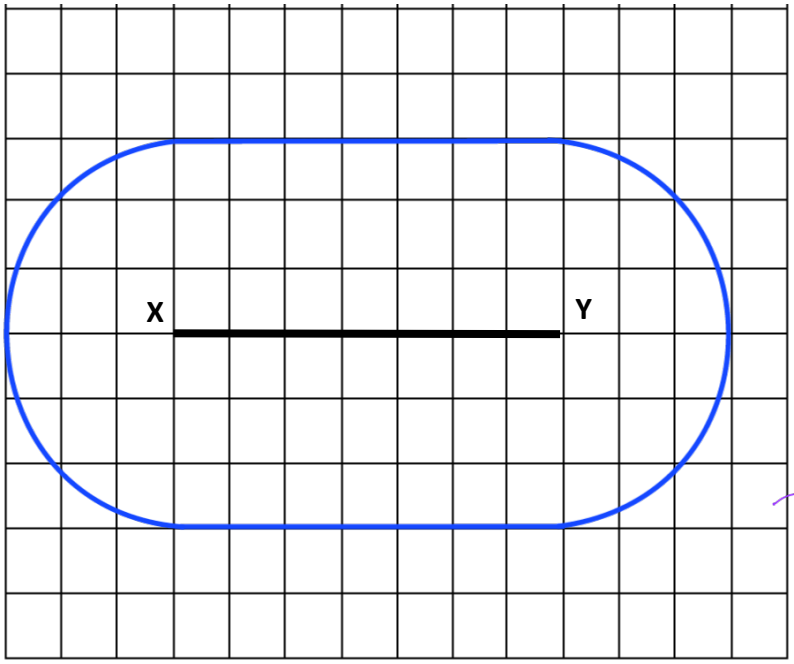
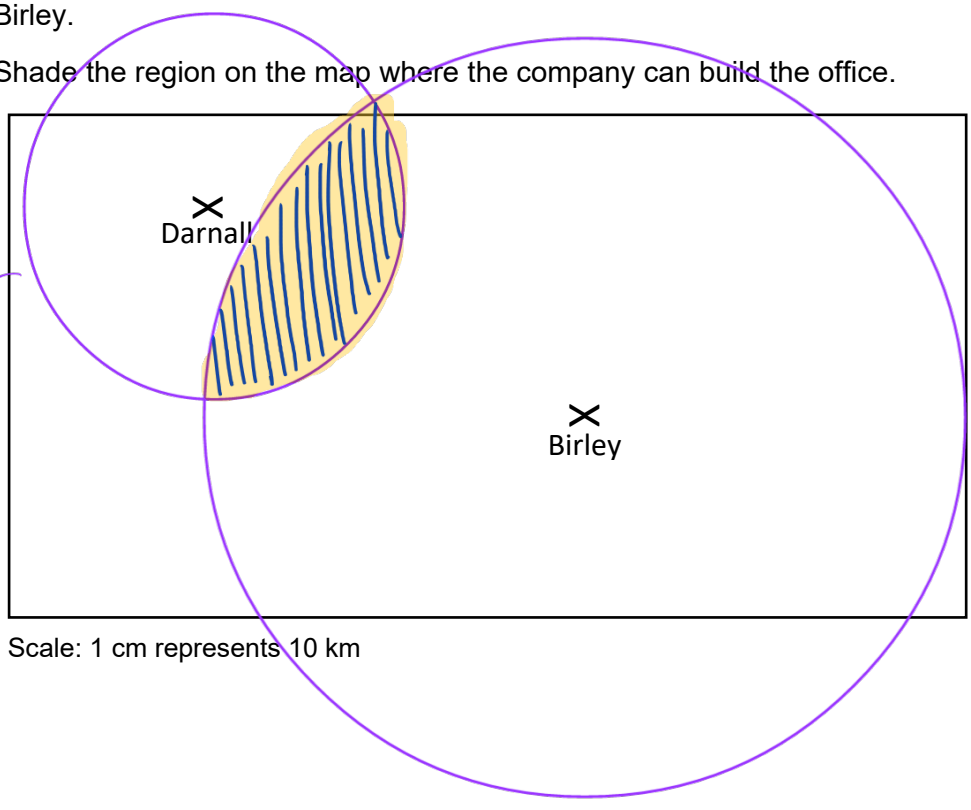
4. Draw the locus of all the points that are exactly 3cm away from the line XY.



Assumption : 1 square = 1 cm

5. The map below shows two towns, Darnall and Birley. A company wants to build an office. The office will be less than 20 km from Darnall and less than 40 km from Birley.

   Shade the region on the map where the company can build the office.



Scale: 1 cm represents 10 km

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