Planner

Constructions (1)

- Constructing a perpendicular bisector
- Bisecting an angle
- Constructing a perpendicular from a point to a line
- Constructing a perpendicular from a point on a line

Keywords

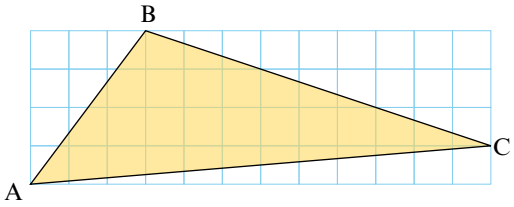
You should know

explanation 1a | explanation 1b | explanation 1c | explanation 1d | online

1 Practise using a pair of compasses to construct perpendicular bisectors of lines that are not horizontal or vertical.

Make sure you are confident that you can do this type of construction well.

2 Using a ruler and pencil, draw triangle ABC on squared paper.



a Construct the perpendicular bisector of side AB.

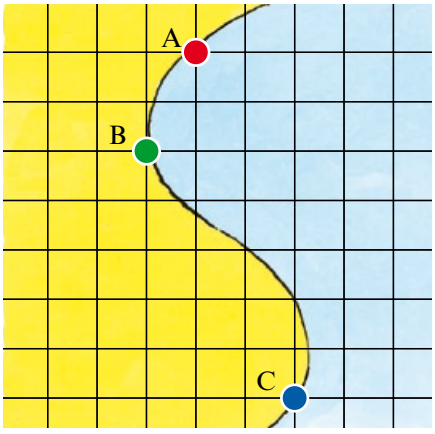
b Construct the perpendicular bisector of side BC.

c What do you notice about the distance of the point of intersection of the two perpendicular bisectors from A, B and C?

3 The map shows a shoreline.

Three people stand at A, B and C. They each see a boat out at sea. The boat is equidistant from each of the three people.
Copy the diagram. By construction, locate the position of the boat.

Use what you found out in question **2c** to help you.



explanation 2a | explanation 2b | explanation 2c | explanation 2d | online

4 Practise using a pair of compasses to construct angle bisectors.

Bisect angles of different sizes, for example some acute and some obtuse.

Make sure you are confident that you can do this type of construction well.

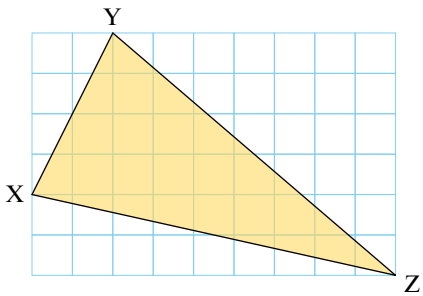
5 This question is about bisecting angles.

a Using a protractor, draw an angle of 70°.

b By construction, bisect the angle.

c Using a protractor, check that the angle has been bisected.

6 Draw triangle XYZ on squared paper.



a By construction, bisect angle X.

b By construction, bisect angles Y and Z.

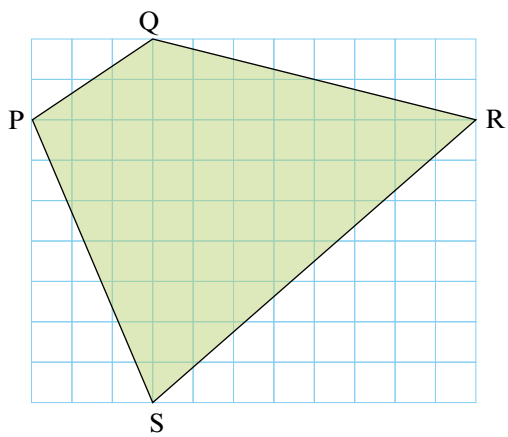
c What do you notice about the three angle bisectors?

7 The diagram shows a field PQRS.

The farmer wants to plant a hedge that bisects the corner of his field at P.

a Copy the diagram onto squared paper.

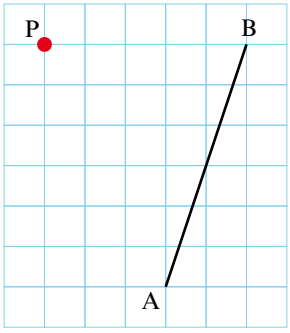
b By construction, show where the hedge will be planted.



explanation 3a | explanation 3b | explanation 3c | explanation 3d | online

8 Practise using a pair of compasses to construct the perpendicular from a point to a line that is not horizontal or vertical.
Make sure you are confident that you can do this type of construction well.

9 Copy this diagram onto squared paper.



a Construct the shortest line segment from P to the line AB.

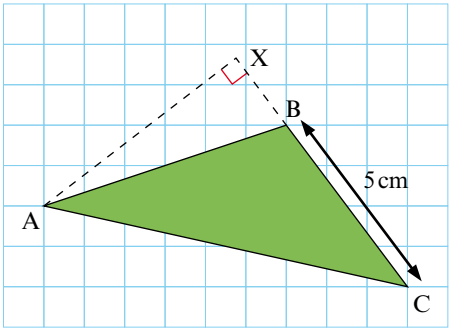
Label the point where the two lines meet Q.

b You can construct an angle of 45° by bisecting a right angle.

Without using a protractor, mark and label a point R so that angle PQR = 45° and PQ = QR.

10 Copy triangle ABC onto centimetre squared paper.

Check that the length of side BC is 5 cm.



a Line segment AX is perpendicular to side BC.

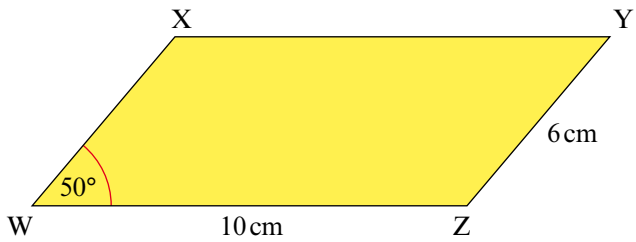
Construct the line segment AX and measure its length.

b The area of the triangle is given by

$\frac{1}{2}$ × length BC × length AX

Use your answer to part **a** to calculate the area of the triangle.

11 Using a ruler and protractor, copy the parallelogram WXYZ below.



a By construction, bisect angle WZY.

b Mark a point, P, 4 cm from Z on the line constructed in part **a**.

c Construct the shortest line from P to the line WZ. Measure its length.

d Construct the shortest line from P to YZ. Measure its length.

explanation 4a explanation 4b explanation 4c

12 Practise using a pair of compasses to construct a perpendicular from a point on a line that is not horizontal or vertical.

Make sure you are confident that you can do this type of construction well.

13 Follow the instructions to draw a diagram. Make a sketch first.

a Draw a line AB 7 cm long. Mark a point X on it so that AX = 5 cm.

b Construct a perpendicular to the line AB, passing through X. Label the line XY.

c Mark a point C on XY so that XC = 8 cm.

d Draw the triangle ABC. Measure the lengths AC and BC.

14 Follow the instructions to draw a diagram. Make a sketch first.

a Draw a line PQ 8 cm long. Mark two points X and Y on it so that PX = 3 cm and PY = 5 cm.

b Construct perpendiculars to the line PQ, passing through X and Y. Label the lines WX and YZ.

c Mark a point S on WX so that XS = 4 cm.

d Mark a point R on YZ so that YR = 4 cm.

e Draw the quadrilateral PQRS. What type of quadrilateral is PQRS?

f Measure the lengths PS and QR.