



## Constructions

- Constructing the circumference of a triangle
- Constructing the perpendicular from a point to a line
- Constructing a perpendicular at a point on a line
- Constructing 2-D shapes

Keywords

You should know

explanation 1a

explanation 1b

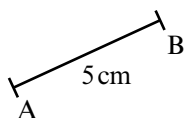
**1** The diagrams show lines of different lengths.

**a** Draw each line accurately.

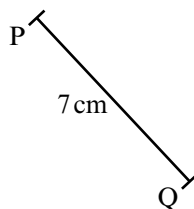
Construct the perpendicular bisector of each line.

Use a dashed line for the perpendicular bisector.

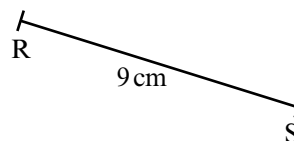
**i**



**ii**



**iii**



**b** How can you tell if your drawings are accurate?

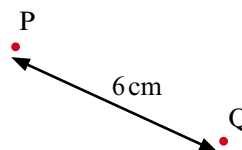
**2** Draw two points that are 83 mm apart. Use a construction to find the midpoint.

**3** The points P and Q are 6 cm apart.

**a** Copy the diagram accurately and construct the perpendicular bisector of PQ.

**b** What can you say about any point on the perpendicular bisector?

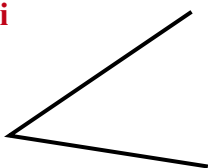
**c** Select any point on the perpendicular bisector, except the midpoint of PQ, and label it R. What kind of triangle is PQR?



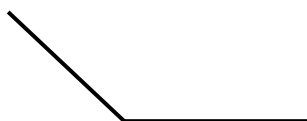
explanation 2

**4** The diagrams show angles of different sizes.

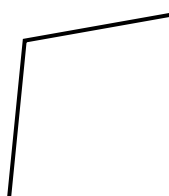
**i**



**ii**



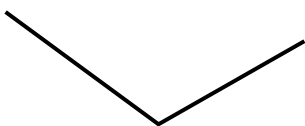
**iii**



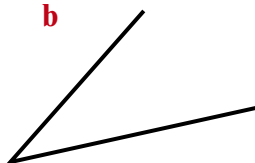
- a** Copy each angle and construct its bisector.
- b** How can you tell if your constructions are accurate?

**5** Copy each angle and construct its bisector.

**a**



**b**



**c**

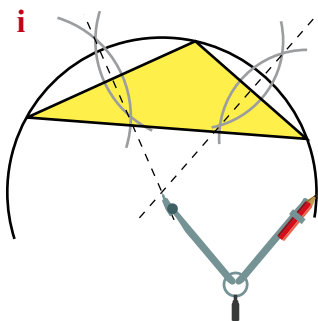


explanation 3a

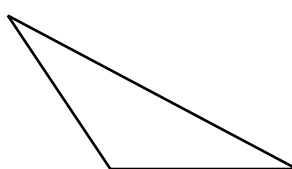
explanation 3b

**6** The diagrams show three triangles.

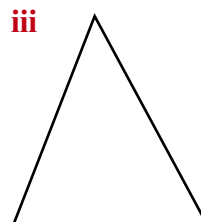
**i**



**ii**



**iii**



- a** Copy each triangle.
- b** Construct the perpendicular bisector of two sides of each triangle.
- c** Draw the circumcircle of each triangle.
- d** How can you tell if your constructions are accurate?

**7** The diagram shows three points.

• R

**a** Draw the three points P, Q and R.

• P

**b** Construct the perpendicular bisector of PQ.

**c** Construct the perpendicular bisector of RQ.

• Q

**d** Label the point O where these two bisectors meet.

**e** With centre at O and radius OP draw a circle.

**f** What is special about the point O?

**8** The labels show the lengths of sides of three triangles.

**a** 6 cm, 8 cm and 10 cm

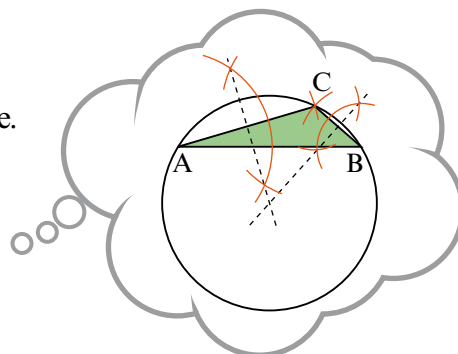
**b**  $AB = 9\text{ cm}$ ,  $AC = 7\text{ cm}$   
and  $BC = 3\text{ cm}$

**c** Equilateral triangle  
with side 6 cm

**i** Construct each triangle.

**ii** Construct the circumcircle.

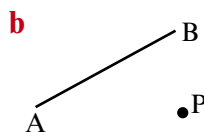
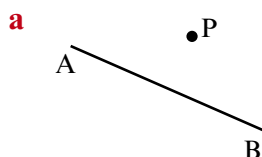
**iii** Measure the radius of the circumcircle.



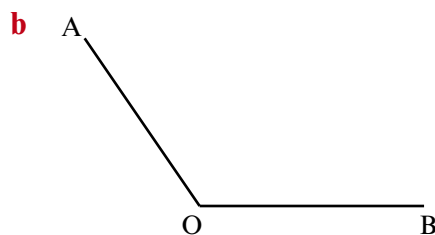
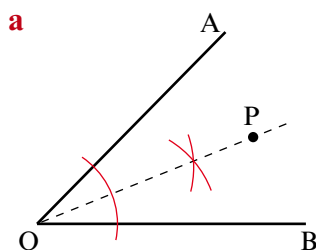
explanation 4a

explanation 4b

**9** Copy each diagram onto plain paper, and construct the perpendicular from the point P to the line AB.

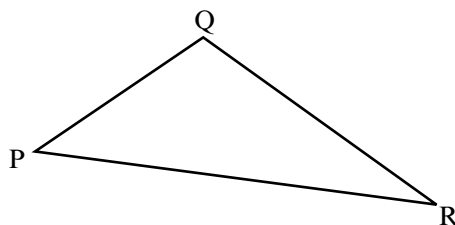


**10** Colin drew two diagrams.

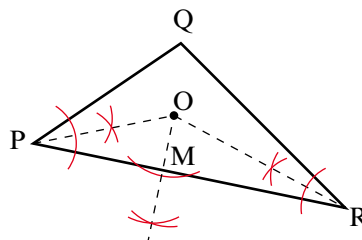


- i** Explain the construction that Colin has done in diagram **a**.
- ii** Copy diagram **a** and carry out the construction accurately.
- iii** Label the point P, where  $OP = 6$  cm. Construct the perpendicular from the point P to the line OB.  
This line meets OB at the point N. Label this on your diagram.
- iv** With centre P and radius PN, draw a circle.  
What do you notice about this circle?
- v** Repeat **ii** to **iv** for diagram **b**.

**11** The diagram shows the triangle PQR.



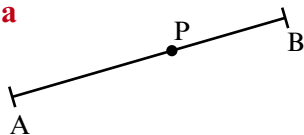
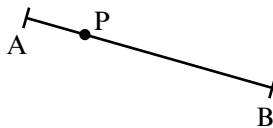
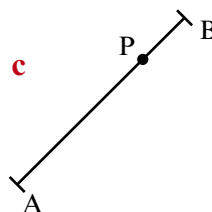
- a** Copy the triangle PQR. Make it quite large, so you have space for construction lines.
- b** Construct the bisector of the angle QPR.
- c** Construct the bisector of the angle QRP.
- d** These two lines meet at O. Label O.
- e** Construct the perpendicular from O to PR, which meets PR at M.
- f** Draw a circle, centre O and radius OM.  
What can you say about this circle?



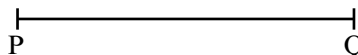
explanation 5a

explanation 5b

- 12** Copy each diagram and construct the perpendicular to the line AB at the point P.

**a**

**b**

**c**


- 13** The diagram shows the line PQ.

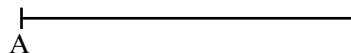


- a** Copy the diagram and construct a perpendicular to the line PQ at the point P. (Remember to extend the line first.)  
**b** Explain how you can construct an angle of  $45^\circ$  at P.

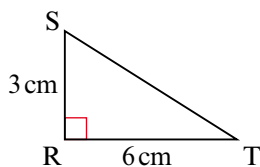
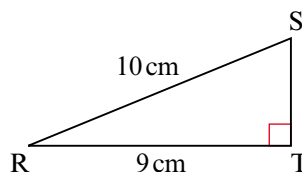
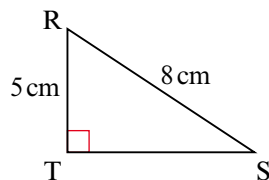
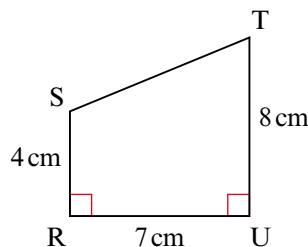
explanation 6a

explanation 6b

- 14** Explain how to construct  $90^\circ$  at the point A.



- 15** On plain paper, construct each shape, using a ruler and pair of compasses only. Measure the length ST in each case.

**a**

**b**

**c**

**d**


- 16** The diagonals of a rhombus meet at right angles and bisect each other.
- a** Construct a rhombus with diagonals 5 cm and 11 cm.  
**b** Measure the length of each side.