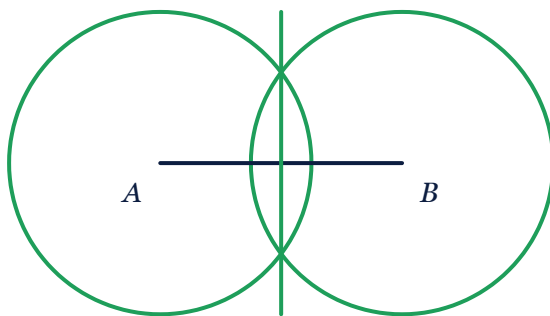




- 1 Draw a line segment AB of length 8 cm.
Using a ruler and compasses only, construct the perpendicular bisector of AB.
You must show all your construction lines.



(2 marks)

Open the compasses to a radius more than half of AB (more than 4 cm)

With the point on A, draw arcs above and below the line. Keep the same radius, put the point on B and draw arcs crossing the first pair

Draw the straight line through the two points where the arcs cross - this is the perpendicular bisector of AB

Each arc intersection is equally far from A and B because the compass radius stayed the same. Joining these equidistant points gives the line through the midpoint at 90° , called the perpendicular bisector

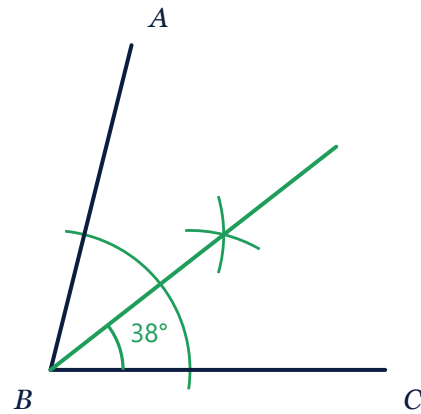
2

The diagram shows angle ABC.

Using a ruler and compasses only, construct the bisector of angle ABC.

You must show all your construction lines.

Then use a protractor to measure one of the two angles your bisector makes.



(2 marks)

Compass point on B: one arc crossing both arms

Same radius from each crossing point: arcs cross inside the angle

Join B to where the arcs cross

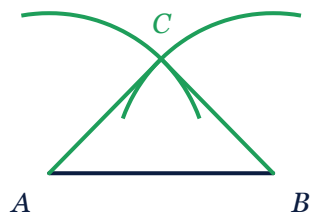
$$76^\circ \div 2 = 38^\circ$$

Bisector drawn, each half 38°

3

Using a ruler and compasses only, construct an isosceles triangle ABC in which $AB = 7$ cm and $AC = BC = 5$ cm.

You must show all your construction arcs.



(2 marks)

Draw the base AB of length 7 cm with a ruler

Open the compasses to 5 cm. With the point on A , draw an arc above AB ; with the point on B and the same radius, draw a second arc crossing the first at C

Join AC and BC to complete the triangle. $AC = BC = 5$ cm, so the triangle is isosceles

4

Here is a sketch of an equilateral triangle with sides of 6 cm.

Using a ruler and compasses only, construct the triangle accurately in the space below. You must show all your construction arcs.

Write down the size of each angle in your triangle.

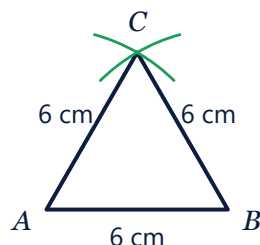


Diagram NOT accurately drawn

(2 marks)

Draw $AB = 6 \text{ cm}$

Compasses set to 6 cm

Arc from A, arc from B: they cross at C

Join AC and BC

$$180^\circ \div 3 = 60^\circ$$

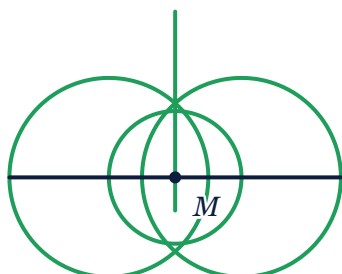
Each angle is 60°

5

Draw a straight line 10 cm long. Mark a point M on the line, about halfway along.

Using a ruler and compasses only, construct the line perpendicular to the line at the point M.

You must show all your construction lines.



(2 marks)

With the compass point on M, mark two points X and Y on the line at equal distances either side of M

Open the compasses wider. With the point on X, then on Y, draw two arcs of the same radius crossing above the line

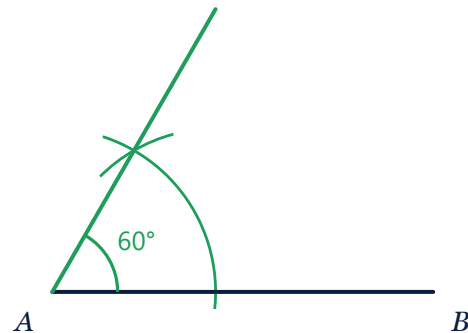
Draw the straight line from M through the point where the arcs cross - it is perpendicular to the line at M

6

The diagram shows a line AB.

Using a ruler and compasses only, construct an angle of 60° at A.

You must show all your construction arcs.



(2 marks)

Arc from A crossing AB at X

Same radius: arc from X crossing the first arc

Join A to the crossing point

A, X and the crossing point make an equilateral triangle

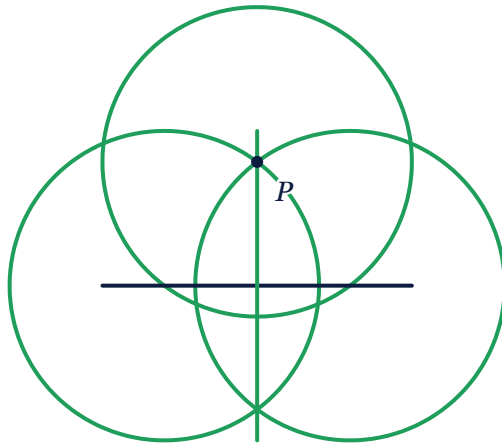
Angle at A = 60°

7

Draw a straight line 10 cm long. Mark a point P about 4 cm above the line.

Using a ruler and compasses only, construct the perpendicular from P to the line.

You must show all your construction lines.



(2 marks)

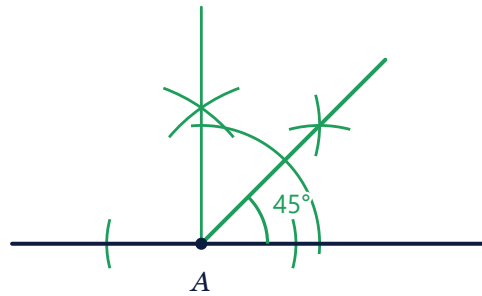
With the compass point on P, draw an arc that crosses the line at two points, X and Y

With the same radius, draw arcs from X and from Y that cross on the far side of the line from P

Draw the straight line from P through this crossing point - it meets the original line at 90°

8

The diagram shows a straight line with a point A marked on it.
Using a ruler and compasses only, construct an angle of 45° at A.
You must show all your construction lines.



(3 marks)

Step 1: perpendicular at A

Equal arcs from A cut the line either side

Wider arcs from those points cross above A

Join A to the crossing: 90°

Step 2: bisect the 90° angle

$$90^\circ \div 2 = 45^\circ$$

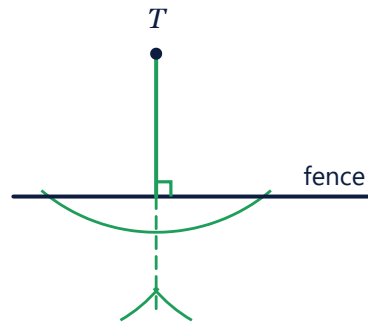
Angle of 45° at A

9

The diagram shows a tree T in a field and a straight fence.

Ellie wants to walk from the tree to the fence by the shortest possible route.

- Using a ruler and compasses only, construct the shortest route from T to the fence. You must show all your construction lines.
- Explain why this route is the shortest.



(3 marks)

a)

Arc from T cuts the fence at two points

Equal arcs from those points cross below the fence

Join T to the crossing point

b)

The route meets the fence at 90°

Any other route is the slanted side of a right-angled triangle, so it is longer

Shortest route = the perpendicular from T

10

Here is a sketch of triangle ABC.

$AB = 7\text{ cm}$, $AC = 5\text{ cm}$ and angle $BAC = 60^\circ$.

Using a ruler and compasses only, construct triangle ABC accurately. You must show all your construction arcs.

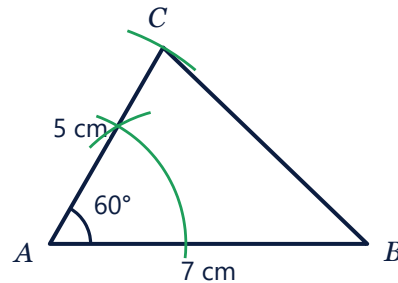


Diagram NOT accurately drawn

(3 marks)

Draw $AB = 7\text{ cm}$

60° at A: arc from A, same radius arc from where it cuts AB

Line from A through the crossing point

Compasses at 5 cm from A: mark C on that line

Join BC

Triangle ABC constructed (SAS)

11

Here is a sketch of triangle PQR.

PQ = 8 cm, angle QPR = 45° and angle PQR = 60° .

- Using a ruler and compasses only, construct triangle PQR accurately. You must show all your construction lines.
- Work out the size of angle PRQ. Check your answer by measuring your drawing.

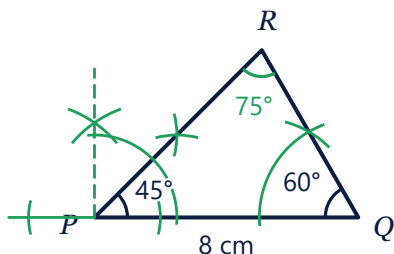


Diagram NOT accurately drawn

(4 marks)

a)

Draw $PQ = 8 \text{ cm}$

At P: construct 90° , then bisect it to get 45°

At Q: two equal arcs give 60°

R is where the two lines cross

b)

$$180^\circ - 45^\circ - 60^\circ$$

$$= 75^\circ$$

$\text{Angle PRQ} = 75^\circ$

12

PQRS is a rhombus. Each side of the rhombus is 5 cm long. The diagonal PR is 8 cm long.

- Using a ruler and compasses only, construct the rhombus PQRS accurately. You must show all your construction arcs.
- Measure the length of the other diagonal, QS.

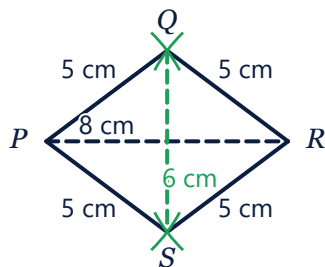


Diagram NOT accurately drawn

(4 marks)

a)

Draw $PR = 8 \text{ cm}$

Compasses at 5 cm: arcs from P above and below

Same radius from R: crossings are Q and S

Join PQ, QR, RS, SP

b)

Measure QS

$QS = 6 \text{ cm}$
