



- 1** A pupil is constructing a 60° angle at point P on a straight line. She puts the compass point on P , sets the radius to 5 cm and draws an arc that crosses the line at Q . She keeps the compasses at 5 cm, puts the point on Q and draws a second arc that crosses the first arc at R .

Explain why angle RPQ is 60° .

(2 marks)

$PQ = 5 \text{ cm}$ (first arc)

$PR = 5 \text{ cm}$ (first arc)

$QR = 5 \text{ cm}$ (second arc)

All sides equal: equilateral triangle

Each angle = 60°

- 2** Farida wants to construct a triangle with sides 3 cm, 4 cm and 8 cm using a ruler and compasses.

Explain why she cannot.

(2 marks)

$$3 + 4 = 7$$

$$7 < 8$$

Two shorter sides add up to less than the longest side

The arcs cannot meet, so no triangle

- 3** Describe, step by step, how to construct a triangle with sides 6 cm, 8 cm and 9 cm using only a ruler and compasses.

(3 marks)

1. Draw $AB = 9 \text{ cm}$

2. Compasses 6 cm, centre A , draw an arc

3. Compasses 8 cm, centre B , draw an arc

4. Arcs cross at C

Join AC and BC

- 4 Describe, step by step, how to construct an angle of 60° at a point P on a straight line, using only a ruler and compasses.

(3 marks)

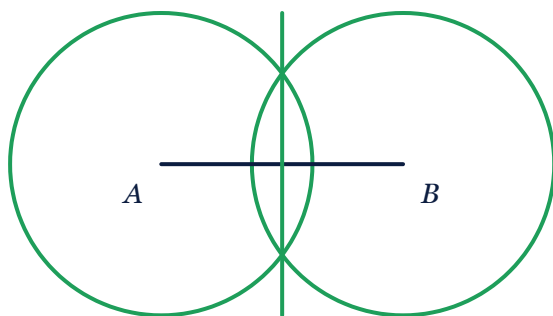
1. Centre P , draw an arc crossing the line at Q
2. Same radius, centre Q , arc crossing the first at R
3. Join P to R

$$\text{Angle } RPQ = 60^\circ$$

- 5 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

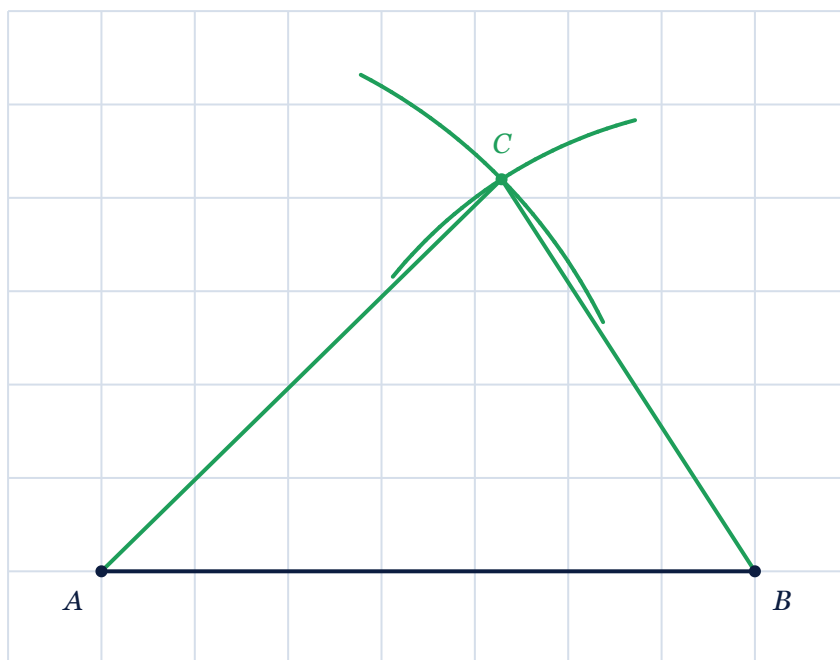
Each arc intersection is equally far from A and B because the compass radius stayed the same. Joining these equidistant points gives the line through the midpoint at 90° , called the perpendicular bisector

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The diagram shows the line AB on a square grid. AB is 7 squares long.

Using a ruler and compasses only, construct triangle ABC with $AC = 6$ squares and $BC = 5$ squares.

Use the grid to set your compasses. You must show all your construction arcs.



(3 marks)

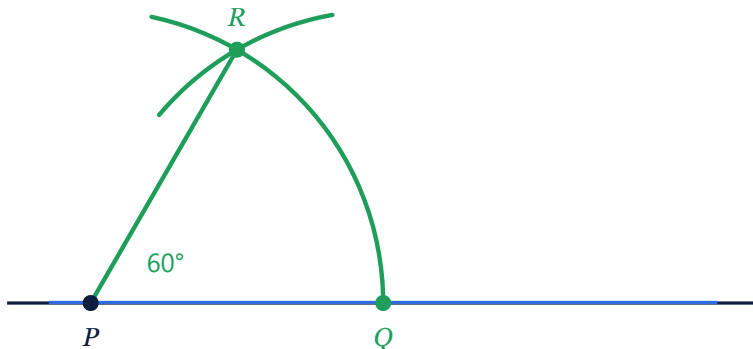
1. Compasses 6 squares, centre A, arc above AB
2. Compasses 5 squares, centre B, arc across the first
3. Arcs cross at C
4. Join AC and BC, keep the arcs

Triangle ABC: $AC = 6$, $BC = 5$, $AB = 7$ squares

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The diagram shows a straight line and a point P on it.

Using a ruler and compasses only, construct an angle of 60° at the point P . Show your construction arcs.



(3 marks)

1. Centre P , arc crosses the line at Q
2. Same radius, centre Q , arc crosses first arc at R
3. Join P to R

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Describe how to construct an angle of 30° at a point P on a straight line, using only a ruler and compasses. (Hint: start with a 60° angle.)

(3 marks)

1. Construct 60° at P
2. Arc centre P across both arms of the angle
3. Equal arcs from those two points, crossing
4. Join P to the crossing

$$60^\circ \div 2 = 30^\circ$$

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A triangle is constructed with sides 5 cm, 7 cm and 9 cm.

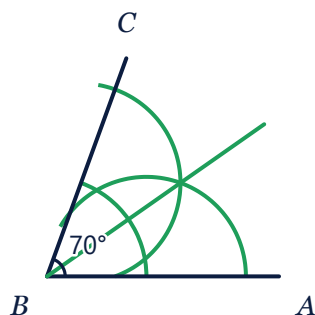
Which angle is the largest? Give a reason.

(2 marks)

Largest angle is opposite the longest side

Opposite the 9 cm side

- 10 Draw an angle ABC of 70° using a protractor, where B is the vertex of the angle.
Using a ruler and compasses only, construct the bisector of angle ABC.
You must show all your construction lines.



(2 marks)

With the compass point on B, draw an arc crossing BA at P and BC at Q

With the same radius, draw arcs from P and from Q that cross at a point R inside the angle

Draw the straight line from B through R - this bisects angle ABC into two angles of 35°

- 11 Describe how to construct an angle of 45° at a point P on a straight line, using only a ruler and compasses.

(3 marks)

1. Perpendicular at P gives 90°
2. Bisect the 90° angle

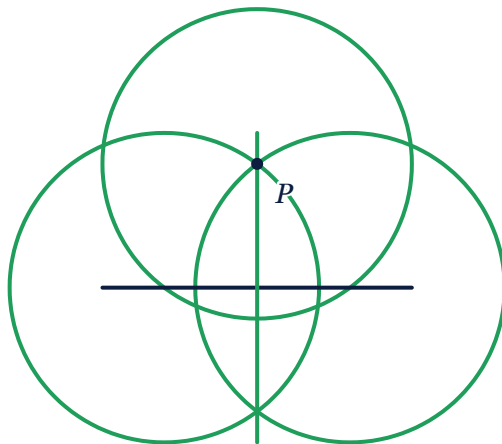
$$90^\circ \div 2 = 45^\circ$$

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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

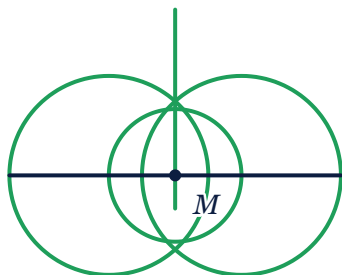
Draw the straight line from P through this crossing point - it meets the original line at 90°

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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

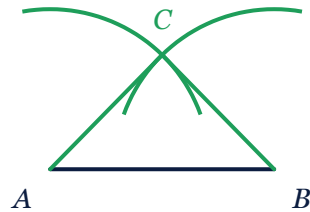
Open the compasses wider. With the point on X, then on Y, draw two arcs of the same radius crossing above the line

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

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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