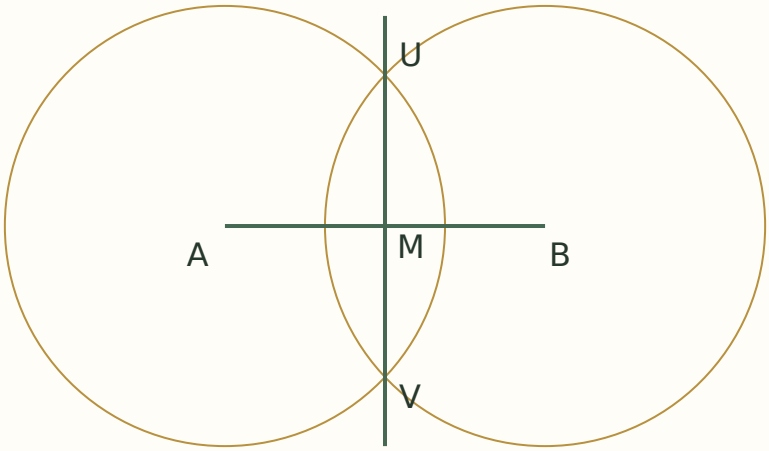
Geometric constructions

6 questions | 19 marks

Equivalent correct methods earn the corresponding marks.

1. Draw an 8 cm segment and construct its perpendicular bisector. State a suitable radius. [4 marks]



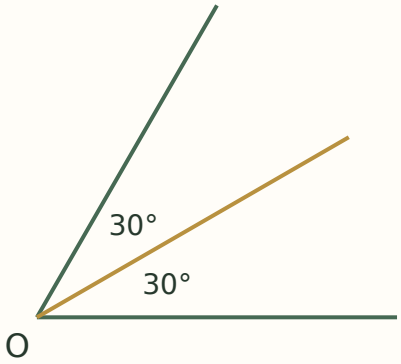
Equal compass radii greater than half AB.

Use the same radius greater than 4 cm at each endpoint.

Join the two crossings.

Answer: For example, radius 5 cm; the line crosses at the 4 cm midpoint at 90°.

2. Construct the bisector of a 60° angle. State the new angles. [3 marks]



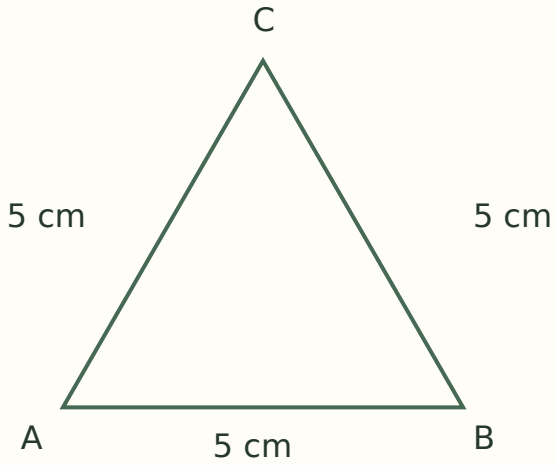
Equal angles, each 30°. Sketch not to scale.

Use equal-distance arm marks and equal-radius crossing arcs.

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

Answer: 30° and 30°.

3. Construct an equilateral triangle with side length 5 cm. Explain why the sides are equal. [4 marks]



Equal-radius circles locate C. Sketch not to scale.

Draw $AB = 5$ cm.

Draw circles of radius 5 cm centred at A and B.

Join an intersection C to A and B. Both new sides are radii.

Answer: Each side is 5 cm.

4. A point P is equally far from A and B. On which line must P lie? [2 marks]

The locus of points equally far from the endpoints is their perpendicular bisector.

Answer: The perpendicular bisector of AB.

5. A student changes compass width between the arcs from A and B. Why does the usual proof fail? [3 marks]

Different radii represent different distances.

The construction needs equal distances to both endpoints.

Answer: The crossings are not guaranteed to be equally far from A and B.

6. Two circles have radius 4 cm and centres 8 cm apart. Why are they unsuitable for the usual two-crossing construction? [3 marks]

The radius is exactly half the centre distance.

Two distinct crossings are needed to determine the joining line.

Answer: They touch at one point only.