GCSE Maths: Constructing triangles (Foundation): answers

GCSE Maths - Loci, Bearings and Vectors - Foundation - Lesson 22.3

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at **websink.site/gcse/maths/ch22-constructions-loci-bearings-vectors/foundation/constructing-triangles/**

Exercise 22D Constructing triangles and measuring

Calculator allowed

1 **Is there enough information to construct exactly one triangle? Write "Yes" or "No" and say why.**

(a) Three sides: 5 cm, 6 cm, 7 cm.

Answer: Yes (SSS)

(b) Three angles: 40°, 60°, 80°.

Answer: No (AAA)

(c) AB = 6 cm, angle A = 35°, AC = 4 cm.

Answer: Yes (SAS)

(d) Sides 3 cm, 4 cm and 8 cm.

Answer: No (3 + 4 < 8)

2 **Construct each triangle with sides of the lengths given. Measure the largest angle in each.**

(a) Sides 4 cm, 5 cm and 6 cm.

Answer: 83° (accept 82° to 84°)

(b) Sides 6 cm, 6 cm and 6 cm.

Answer: 60° (accept 59° to 61°)

(c) Sides 3 cm, 4 cm and 5 cm.

Answer: 90° (accept 89° to 91°)

(d) Sides 5 cm, 5 cm and 8 cm.

Answer: 106° (accept 105° to 107°)

3 **Construct each triangle ABC. AB, the angle at A, and AC are given. Measure BC.**

(a) AB = 7 cm, angle A = 40°, AC = 5 cm.

Answer: 4.5 cm (accept 4.4 to 4.6)

(b) AB = 6 cm, angle A = 90°, AC = 8 cm.

Answer: 10.0 cm (accept 9.9 to 10.1)

(c) AB = 5 cm, angle A = 60°, AC = 5 cm.

Answer: 5.0 cm (accept 4.9 to 5.1)

(d) AB = 8 cm, angle A = 120°, AC = 6 cm.

Answer: 12.2 cm (accept 12.1 to 12.3)

4 **Construct each triangle ABC. Measure the length asked for.**

(a) Angle A = 40°, AB = 7 cm, angle B = 70°. Measure AC.

> **Answer:** 7.0 cm (accept 6.9 to 7.1)

(b) Angle A = 60°, AB = 6 cm, angle B = 60°. Measure AC.

> **Answer:** 6.0 cm (accept 5.9 to 6.1)

(c) Angle A = 30°, AB = 8 cm, angle B = 45°. Measure AC.

> **Answer:** 5.9 cm (accept 5.8 to 6.0)

5 **Construct a right-angled triangle with a right angle at B, AB = 6 cm and hypotenuse AC = 10 cm. Measure BC.**

> **Answer:** 8.0 cm

6 **Triangle ABC is isosceles with AB = AC = 6 cm and BC = 4 cm. Construct the triangle. Measure angle BAC and one of the base angles.**

> **Answer:** angle A ≈ 39°, base angle ≈ 71°

7 **Use a ruler and compasses to construct an equilateral triangle with sides of 5 cm. Explain why every angle must be 60°.**

> **Answer:** All angles 60°

8 **A triangular plot of land has sides of 40 m, 50 m and 60 m. Make a scale drawing using a scale of 1 cm to 10 m. Measure the largest angle of the plot. Give your answer to the nearest degree.**

> **Answer:** 83° (accept 82° to 84°)

9 **Two lighthouses A and B are 6 km apart. A boat C is seen from A at an angle of 50° from the line AB, and from B at an angle of 60° from the line BA, with the boat on the same side of AB. Make a scale drawing using 1 cm to 1 km. How far is the boat from A?**

> **Answer:** 5.5 cm (accept 5.4 to 5.6)

10 **Katie says: "I can make a triangle with sides of 4 cm, 5 cm and 10 cm." Show that Katie is wrong.**

> **Answer:** 4 + 5 = 9, which is less than 10

11 **Two triangles both have angles of 50°, 60° and 70°. One has its shortest side 5 cm long and the other has its shortest side 8 cm long. Explain why these triangles are not congruent, and say what you can say about their shapes.**

> **Answer:** Same shape (similar) but different size, so not congruent

12 **A rhombus has sides of 5 cm and one angle of 60°. Construct the rhombus. Measure its longer diagonal.**

> **Answer:** 8.7 cm

13 **Challenge. A triangle has sides in the ratio 3 : 4 : 5 and a perimeter of 24 cm. Construct it. Show that it has a right angle.**

> **Answer:** Sides 6, 8, 10. 36 + 64 = 100, so it is right-angled.

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