

GCSE Maths: The sine rule (Higher): answers

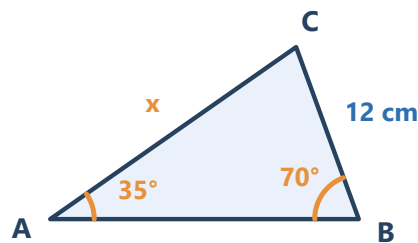
GCSE Maths - Pythagoras and Trigonometry - Higher - Lesson 20.8

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch20-pythagoras-trigonometry/higher/the-sine-rule/

Exercise 20J The sine rule Calculator allowed

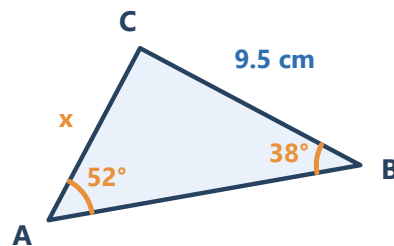
- 1 Work out the length of the side marked x in each triangle. Give your answers correct to 1 decimal place. All lengths are in centimetres.

(a)



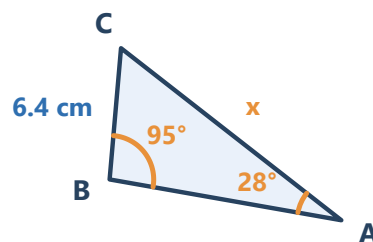
Answer: 19.7 cm

(b)



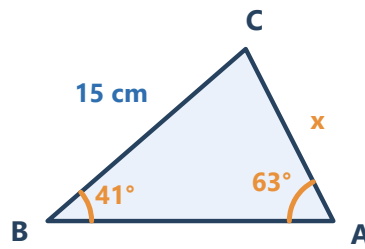
Answer: 7.4 cm

(c)



Answer: 13.6 cm

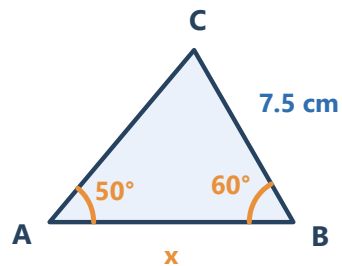
(d)



Answer: 11.0 cm

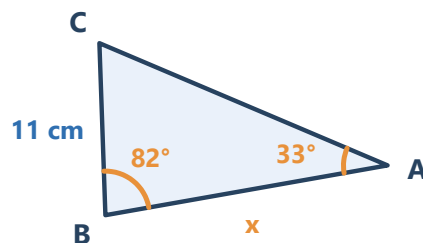
- 2 Work out the length of the side marked x in each triangle. You will need to find a third angle first. Give your answers correct to 1 decimal place. All lengths are in centimetres.

(a)



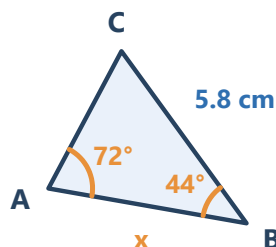
Answer: 9.2 cm

(b)



Answer: 18.3 cm

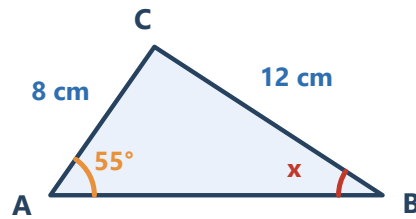
(c)



Answer: 5.5 cm

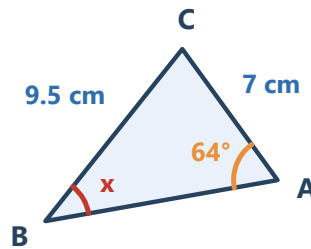
- 3 Work out the size of the angle marked x in each triangle. Each angle x is acute. Give your answers correct to 1 decimal place. All lengths are in centimetres.

(a)



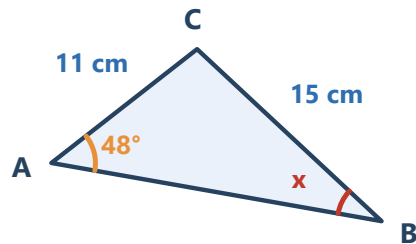
Answer: 33.1°

(b)



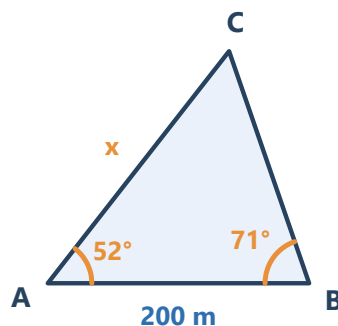
Answer: 41.5°

(c)



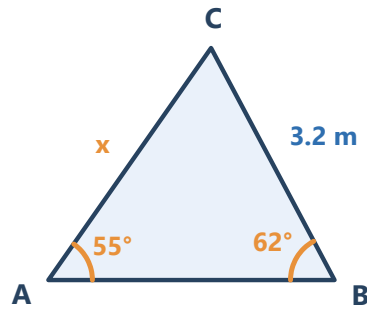
Answer: 33.0°

- 4 A and B are two points 200 m apart on a straight shore. A boat is at C. The angle CAB is 52° and the angle CBA is 71°. Work out the distance AC from the boat to A, correct to 1 decimal place.



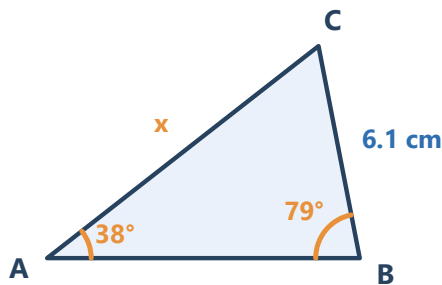
Answer: 225.5 m

- 5 A triangular sail has angles of 55° and 62°. The side opposite the 55° angle is 3.2 m long. Work out the length of the side opposite the 62° angle, correct to 2 decimal places.



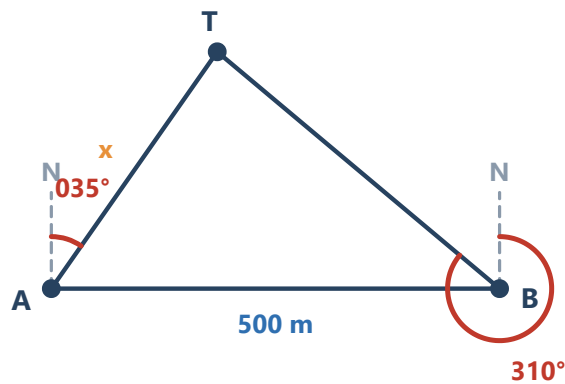
Answer: 3.45 m

- 6 Two angles of a triangle are 38° and 79° . The shortest side is 6.1 cm long. Work out the length of the longest side of the triangle, correct to 1 decimal place.



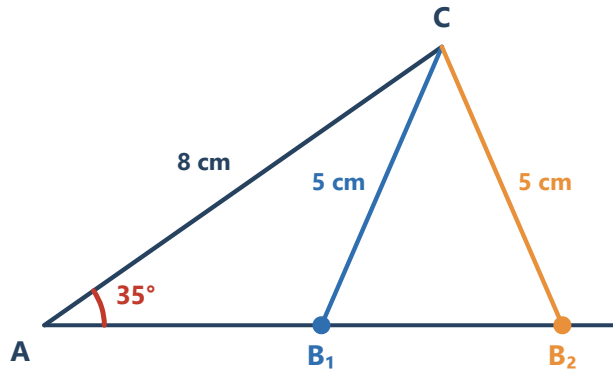
Answer: 9.7 cm

- 7 B is 500 m due east of A. The bearing of a tower T from A is 035° and the bearing of T from B is 310° . Work out the distance AT, correct to 1 decimal place.



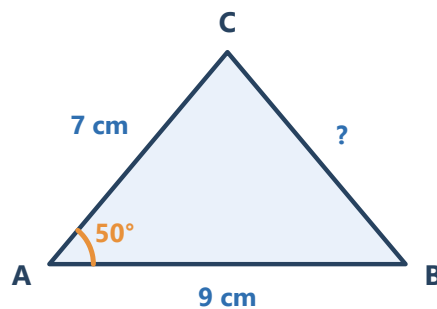
Answer: 322.6 m

- 8 In triangle ABC, angle A = 35° , BC = 5 cm and AC = 8 cm. Show that there are **two** possible triangles by working out both possible sizes of angle B, correct to 1 decimal place.



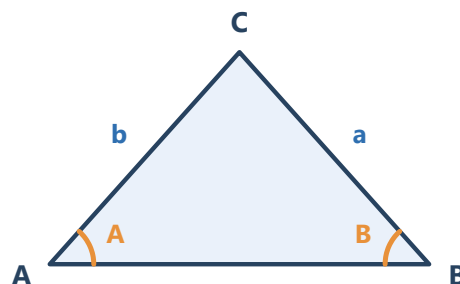
Answer: 66.6° or 113.4°

- 9 Riya wants to find the side marked ? in this triangle using the sine rule. Explain why she cannot start with the sine rule, and say which rule she should use.



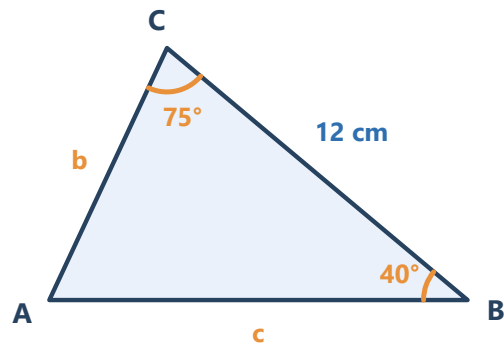
Answer: There is no matching pair of a side and its opposite angle; use the cosine rule.

- 10 In triangle ABC the angles at A and B are equal. Use the sine rule to show that $a = b$.



Answer: $\sin A = \sin B$, so $a \div \sin A = b \div \sin A$, so $a = b$

- 11 **Challenge.** In triangle ABC, $a = 12$ cm, angle $B = 40^\circ$ and angle $C = 75^\circ$. Work out (a) the length of b , (b) the length of c , (c) the perimeter of the triangle. Give each answer correct to 1 decimal place.



(a) b

Answer: 8.5 cm

(b) c

Answer: 12.8 cm

(c) perimeter

Answer: 33.3 cm