

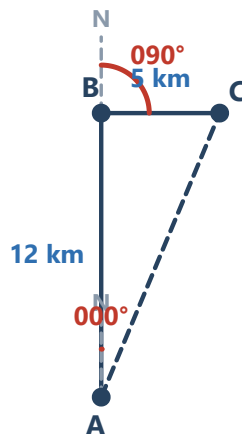
GCSE Maths: Bearings problems: journeys, Pythagoras and trigonometry (Higher): answers

GCSE Maths - Loci, Bearings and Vectors - Higher - Lesson 22.7

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/higher/bearings-problems-journeys-pythagoras-and-trigonometry/

Exercise 22H Bearings and right-angled triangles Calculator allowed

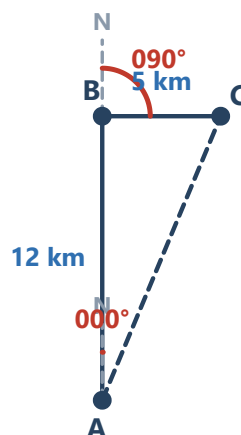
- 1 A ship sails 12 km due north and then 5 km due east. Work out (a) how far the ship is from where it started, (b) the bearing of the ship from its start.



Answer: 13.0 km, 023°

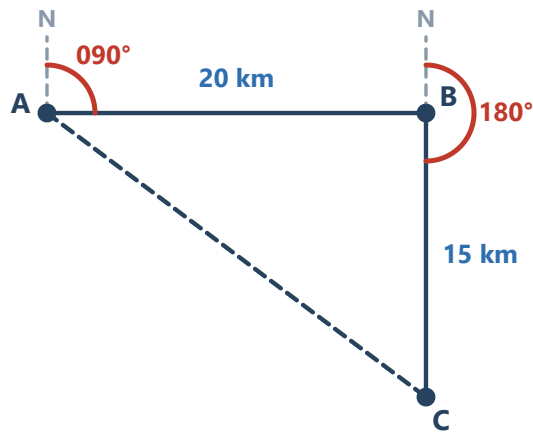
- 2 For each journey, work out (a) the distance AC and (b) the bearing of C from A. Each journey is two legs at right angles: from A to B, then B to C.

(a) A to B: 12 km on 000°. B to C: 5 km on 090°.



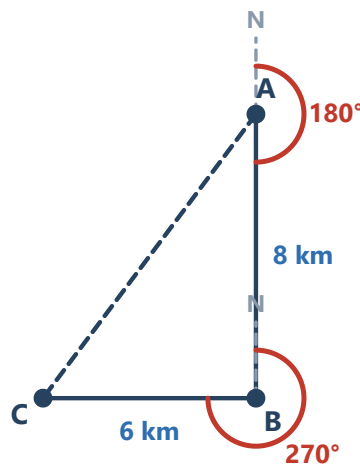
Answer: 13.0 km, 023°

- (b) A to B: 20 km on 090° . B to C: 15 km on 180° .



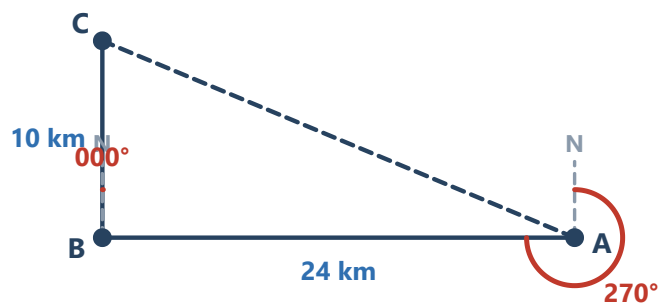
Answer: 25.0 km, 127°

- (c) A to B: 8 km on 180° . B to C: 6 km on 270° .



Answer: 10.0 km, 217°

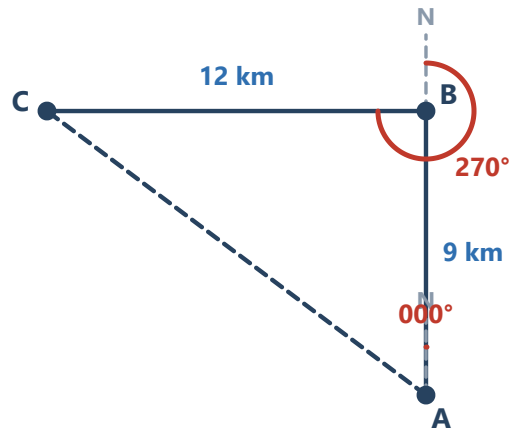
- (d) A to B: 24 km on 270° . B to C: 10 km on 000° .



Answer: 26.0 km, 293°

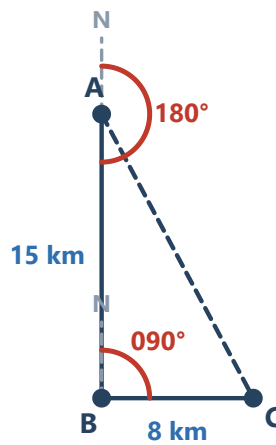
- 3 Work out the distance AC and the bearing of C from A for each journey. The ship turns **left** at B.

- (a) A to B: 9 km on 000° . B to C: 12 km on 270° .



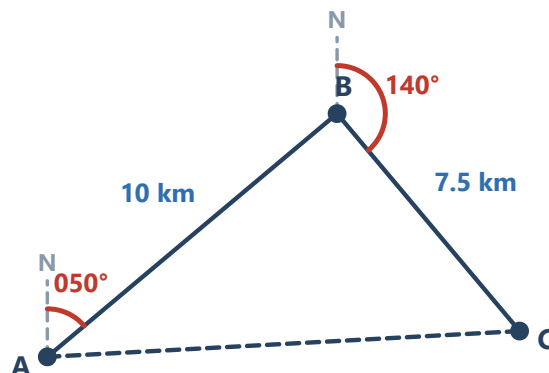
Answer: 15.0 km, 307°

- (b) A to B: 15 km on 180° . B to C: 8 km on 090° .



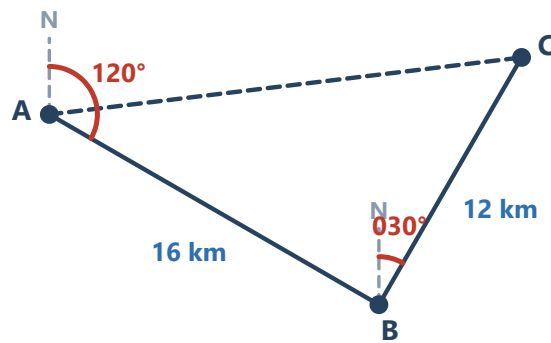
Answer: 17.0 km, 152°

- 4 A boat sails 10 km from A to B on a bearing of 050° . It then sails 7.5 km from B to C on a bearing of 140° . Work out the distance AC and the bearing of C from A.



Answer: 12.5 km, 087°

- 5 A plane flies 16 km from X to Y on a bearing of 120° , then 12 km from Y to Z on a bearing of 030° . Work out (a) the distance XZ, (b) the bearing of Z from X, (c) the bearing of X from Z.



Answer: 20.0 km, 083° , 263°

- 6 Work out the bearing of B from A in each case. Give your answers to the nearest degree. All the distances are in kilometres.

- (a) B is 8 km east and 6 km north of A.

Answer: 053°

- (b) B is 7 km east and 4 km south of A.

Answer: 120°

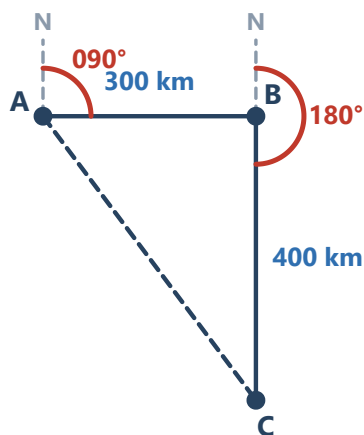
- (c) B is 5 km west and 12 km south of A.

Answer: 203°

- (d) B is 3 km west and 9 km north of A.

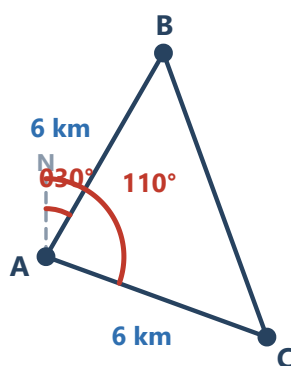
Answer: 342°

- 7 An aeroplane flies 300 km from an airport A due east to B. It then turns and flies 400 km due south to C. Work out (a) how far C is from the airport, (b) the bearing on which the plane must fly to return from C directly to A.



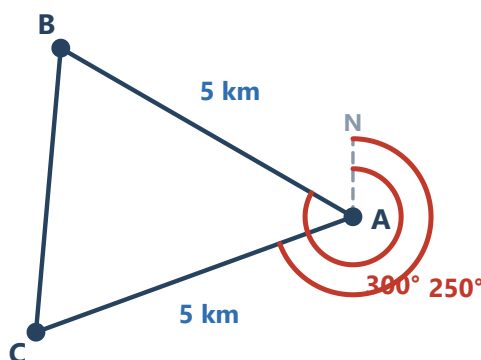
Answer: 500 km, 323°

- 8 A, B and C are three trees. $AB = AC = 6$ m. The bearing of B from A is 030° and the bearing of C from A is 110° . Work out the bearing of C from B.



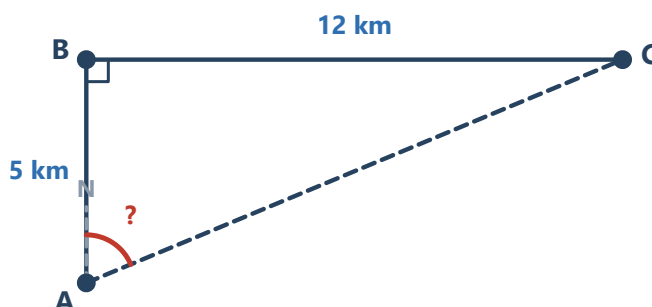
Answer: 160°

- 9 Three markers A, B and C are such that $AB = AC = 5$ km. The bearing of B from A is 300° and the bearing of C from A is 250° . Work out the bearing of C from B.



Answer: 185°

- 10 A ship sails 5 km due north and then 12 km due east. **Show that** the ship is 13 km from its starting point, on a bearing of 067° to the nearest degree.

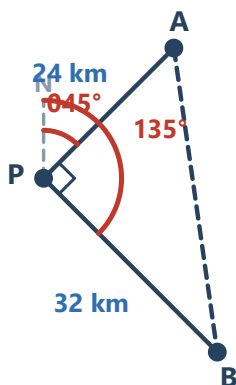


Answer: Distance 13 km; bearing 067°

- 11** Leo works out that $\angle BAC = 36.9^\circ$ in a journey where the bearing of B from A is 070° and the ship then turns right at B. He says: "The bearing of C from A is 036.9° ." Explain his mistake and give the correct bearing.

Answer: 107° . Leo forgot to add 36.9° to the bearing 070° .

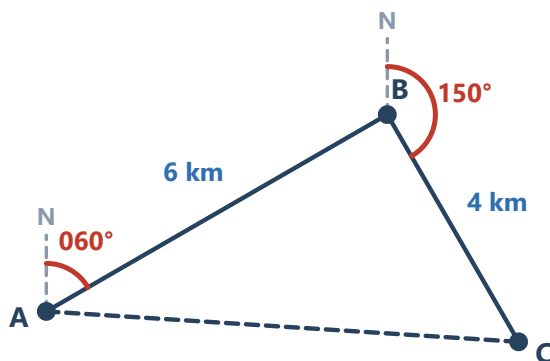
- 12 Challenge.** Two ships leave a port P at the same time. Ship A sails on a bearing of 045° at 12 km/h. Ship B sails on a bearing of 135° at 16 km/h. After 2 hours, work out (a) how far apart the ships are, (b) the bearing of B from A, to the nearest degree.



Answer: (a) 40 km, (b) 172°

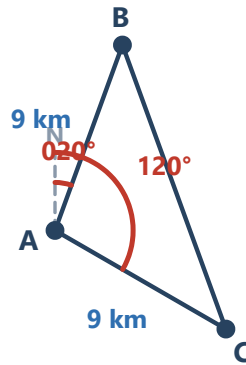
Exercise 22I Harder bearings problems Calculator allowed

- 1** A boat sails 6 km from A to B on a bearing of 060° , then 4 km from B to C on a bearing of 150° . (a) Make a scale drawing with 1 cm to 1 km. (b) Use your drawing to find AC and the bearing of C from A. (c) Check your answers by calculation.



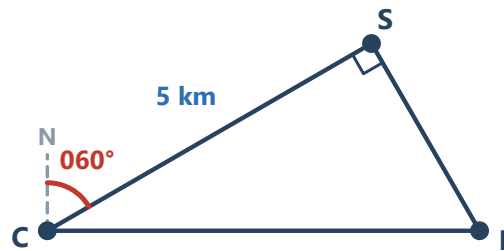
Answer: 7.2 km, 094°

- 2** A, B and C are the corners of an isosceles triangle with $AB = AC = 9$ km. B is on a bearing of 020° from A and C is on a bearing of 120° from A. Work out the bearing of C from B.



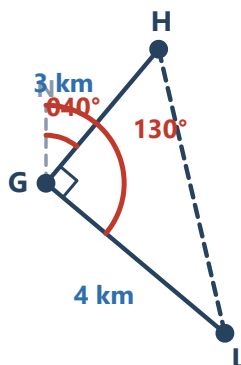
Answer: 160°

- 3 A coastguard station C sees a ship on a bearing of 060° . A lighthouse L is due east of C. The ship S is 5 km from C and the angle at S is 90° (angle $CSL = 90^\circ$). Work out the bearing of L from S.



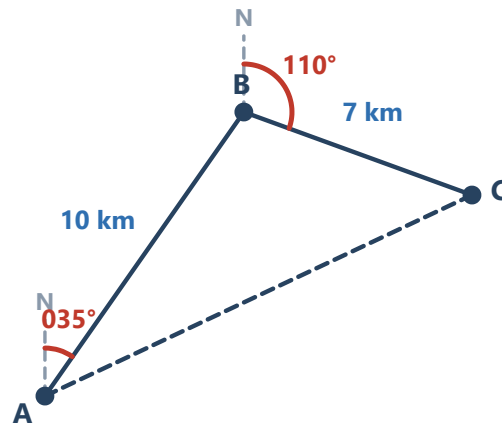
Answer: 150°

- 4 Two paths leave a gate G. Path 1 goes 3 km on a bearing of 040° to a hut H. Path 2 goes 4 km on a bearing of 130° to a lake L. Work out (a) the distance HL, (b) the bearing of L from H, to the nearest degree.



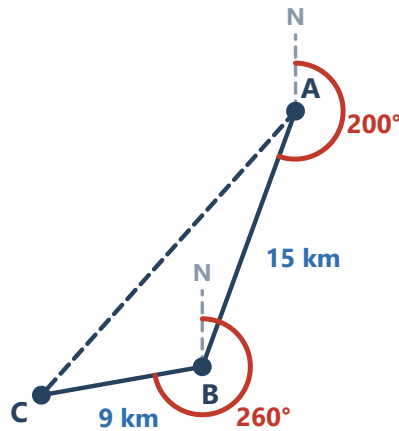
Answer: 5 km, 167°

- 5 A boat sails 10 km from A to B on a bearing of 035° , then 7 km from B to C on a bearing of 110° . Work out the distance AC and the bearing of C from A.



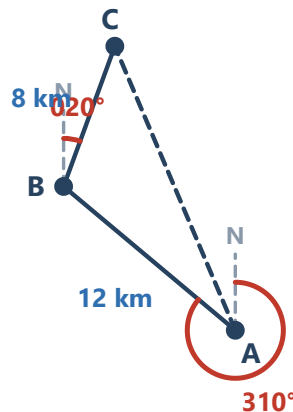
Answer: 13.6 km, 065°

- 6 A helicopter flies 15 km from H to J on a bearing of 200°, then 9 km from J to K on a bearing of 260°. Work out (a) the distance HK, (b) the bearing of K from H, (c) the bearing of H from K.



Answer: 21.0 km, 222°, 042°

- 7 A ship sails 12 km from P to Q on a bearing of 310°, then 8 km from Q to R on a bearing of 020°. Work out the distance PR and the bearing of R from P.

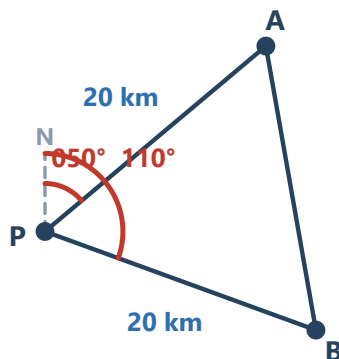


Answer: 16.5 km, 337°

- 8 A boat sails 10 km from A to B on a bearing of 035° and then 7 km from B to C on a bearing of 110° . Work out the area of triangle ABC, correct to 1 decimal place.

Answer: 33.8 km^2

- 9 A ship leaves port P and sails 20 km on a bearing of 050° to A. A second ship sails 20 km from P on a bearing of 110° to B. Work out the bearing of B from A and the distance AB.



Answer: bearing 170° ; $AB = 20.0 \text{ km}$