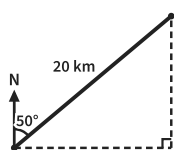


Trigonometry and bearings

ANSWERS 

1

A ship sails 20 km on a bearing of 050° .
How far east of its start is it?
Give your answer to 1 decimal place.



Use **SOH**

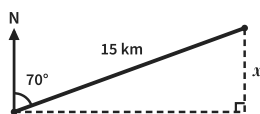
$$x = 20 \times \sin 50^\circ$$

$$x = 15.3 \text{ km}$$

Answer 15.3 km

2

A ship sails 15 km on a bearing of 070° .
How far north of its start is it?
Give your answer to 1 decimal place.



Use **CAH**

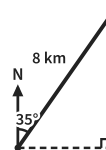
$$x = 15 \times \cos 70^\circ$$

$$x = 5.1 \text{ km}$$

Answer 5.1 km

3

A ship sails 8 km on a bearing of 035° .
How far east of its start is it?
Give your answer to 1 decimal place.



Use **SOH**

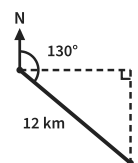
$$x = 8 \times \sin 35^\circ$$

$$x = 4.6 \text{ km}$$

Answer 4.6 km

4

A ship sails 12 km on a bearing of 130° .
How far south of its start is it?
Give your answer to 1 decimal place.
The angle in the triangle is $180^\circ - 130^\circ$.

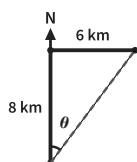


$$x = 7.7 \text{ km}$$

Answer 7.7 km

5

Kim walks 8 km north and then 6 km east.
On what bearing is she from her start?
Give it to the nearest degree.

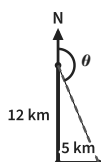


$$\tan \theta = 6 \div 8$$

Answer 037°

6

B is 12 km south and 5 km east of A.
Find the bearing of B from A to the nearest degree.

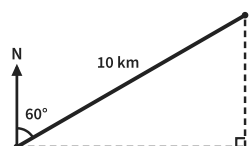


$$\tan^{-1}(5 \div 12) = 22.6^\circ, \text{ then } 180^\circ - 22.6^\circ$$

Answer 157°

7

B is 10 km from A on a bearing of 060° .
How far north of A is B? What is the bearing of A from B?

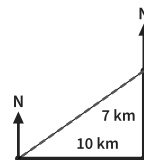


$$10 \times \cos 60^\circ; 60^\circ + 180^\circ$$

Answer 5 km, 240°

8

A drone flies 10 km due east and then 7 km due north.
On what bearing must it fly to get straight back? Give it to the nearest degree.



$$\tan^{-1}(10 \div 7) = 55.0^\circ, \text{ then } 180^\circ + 55.0^\circ$$

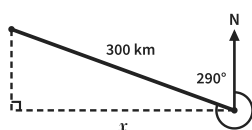
Answer 235°

Trigonometry and bearings further practice

ANSWERS 

9

A plane flies 300 km on a bearing of 290° .
How far west of its start is it?
Give your answer to 1 decimal place.

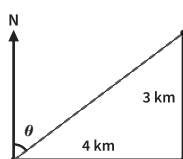


$$\text{the angle with north is } 360^\circ - 290^\circ = 70^\circ$$

Answer 281.9 km

10

A boat is 4 km east and 3 km north of a lighthouse. How far is it from the lighthouse, and on what bearing?

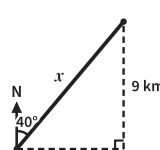


$$\text{Pythagoras, then } \tan^{-1}(4 \div 3)$$

Answer 5 km, 053°

11

A ship is 9 km north of a port, on a bearing of 040° from it. How far is the ship from the port? Give your answer to 1 decimal place.

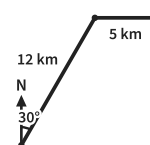


$$\cos 40^\circ = 9 \div x$$

Answer 11.7 km

12

A walker goes 12 km on a bearing of 030° , then 5 km due east. How far is she from her start? Give your answer to 1 decimal place.



$$\text{east 11 km, north 10.39 km, then Pythagoras}$$

Answer 15.1 km

13

Ship A is 8 km due north of a port. Ship B is 6 km due east of the port. Find the bearing of B from A to the nearest degree.

$$\tan^{-1}(6 \div 8) = 36.9^\circ, \text{ then } 180^\circ - 36.9^\circ$$

Answer 143°

14

A point is 7 km west and 7 km north of a town. What is its bearing from the town?

$$\text{the angle is } 45^\circ, \text{ so } 360^\circ - 45^\circ$$

Answer 315°

15

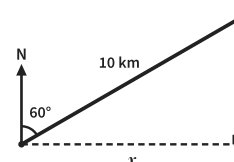
A walker is 4 km south and 9 km west of her camp. On what bearing must she walk to reach the camp?

$$\tan^{-1}(9 \div 4) = 66.0^\circ$$

Answer 066°

16

Tom says a ship that sails 10 km on a bearing of 060° has gone $10 \times \cos 60^\circ = 5$ km east. Explain his mistake.



$$\text{east is opposite the } 60^\circ \text{ angle, so } \sin: 10 \times \sin 60^\circ$$

Answer 8.7 km east