



O Level Maths

Topic: Applications of Trigonometry (Right-angled Triangles, Bearings)

Instructions

Answer all questions. Show all necessary steps. Use trigonometric ratios and properties of right-angled triangles and bearings to solve the problems.

Practice Problems

1. In a right-angled triangle, if the adjacent side is 4 cm and the opposite side is 3 cm, find the length of the hypotenuse.
2. In a right-angled triangle, if $\angle A = 30^\circ$ and the hypotenuse is 10 cm, find the length of the opposite side.
3. In a right-angled triangle, the length of the hypotenuse is 15 cm and the angle adjacent to the base is 60° . Find the length of the adjacent side.
4. A ladder leans against a wall such that the angle between the ladder and the ground is 45° . If the length of the ladder is 12 meters, how high up the wall does the ladder reach?
5. A plane flies from point A to point B on a bearing of 030° . The distance between the two points is 100 km. How far north is the plane from point A ?
6. Two points A and B are 200 meters apart. Point C is on a bearing of 120° from point A . Calculate the distance between point A and point C , assuming the angle between the two bearings is 60° .
7. A boat sails on a bearing of 090° for 15 km, then turns and sails on a bearing of 180° for another 10 km. How far is the boat from its starting point?
8. From point O , a surveyor walks 50 meters on a bearing of 120° to reach point A . He then walks 60 meters on a bearing of 210° to reach point B . Calculate the straight-line distance from point O to point B .

Multiple-Choice Questions

1. In a right-angled triangle, if $\tan(\theta) = \frac{3}{4}$, what is the value of the hypotenuse, assuming the opposite side is 3 cm?
 - A. 5 cm
 - B. 6 cm
 - C. 7 cm
 - D. 4 cm
2. If $\sin(30^\circ) = 0.5$ and the hypotenuse of a right-angled triangle is 12 cm, what is the length of the opposite side?
 - A. 6 cm
 - B. 12 cm
 - C. 3 cm
 - D. 8 cm
3. A ship sails on a bearing of 240° for 100 km. What is the direction of the ship relative to the north line?
 - A. 240°
 - B. 60° east of south
 - C. 30° west of south
 - D. 30° east of north
4. In a right-angled triangle, if $\cos(\theta) = \frac{4}{5}$ and the hypotenuse is 10 cm, what is the length of the adjacent side?
 - A. 8 cm
 - B. 6 cm
 - C. 5 cm
 - D. 12 cm
5. A boat sails on a bearing of 045° for 40 km. Then it changes course to a bearing of 135° for 60 km. How far is the boat from its starting point?
 - A. 50 km
 - B. 60 km
 - C. 45 km
 - D. 55 km