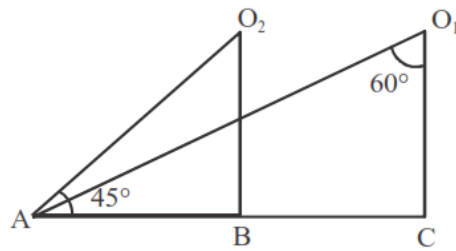


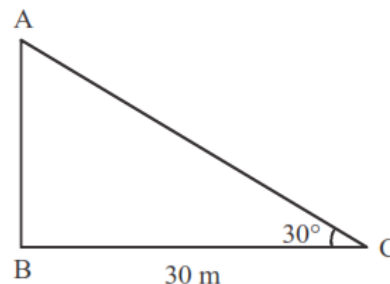
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- On the edge AB of a wall of a house, a projection AP , which is perpendicular to the wall, is erected and its edge is of length 27 cm. A point searchlight is fixed on the corner point P of projection which sends a ray of light PQ such that $AQ = 9\sqrt{3}$ cm. If $\angle APQ = \theta$, then find the value of (i) θ , and (ii) $\tan \theta + \sec \theta$.
- The ratio of the length of a vertical rod and the length of its shadow is $1 : \sqrt{3}$. Find the angle of elevation of the sun at that moment?
- In Fig. 3, the angles of depressions from the observing positions O_1 and O_2 respectively of the object A are _____, _____.



- A statue 1.6 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point the angle of elevation of the top of pedestal is 45° . Find the height of the pedestal. (Use $\sqrt{3} = 1.73$) $\frac{D}{K}$
- From a point on the ground, the angles of elevation of the bottom and the top of a transmission tower fixed at the top of a 20 m high building are 45° and 60° respectively. Find the height of the tower (Use $\sqrt{3} = 1.73$)

- In Figure 4, the angle of elevation of the top of a tower from a point C on the ground, which is 30 m away from the foot of the tower, is 30° . Find the height of the tower.



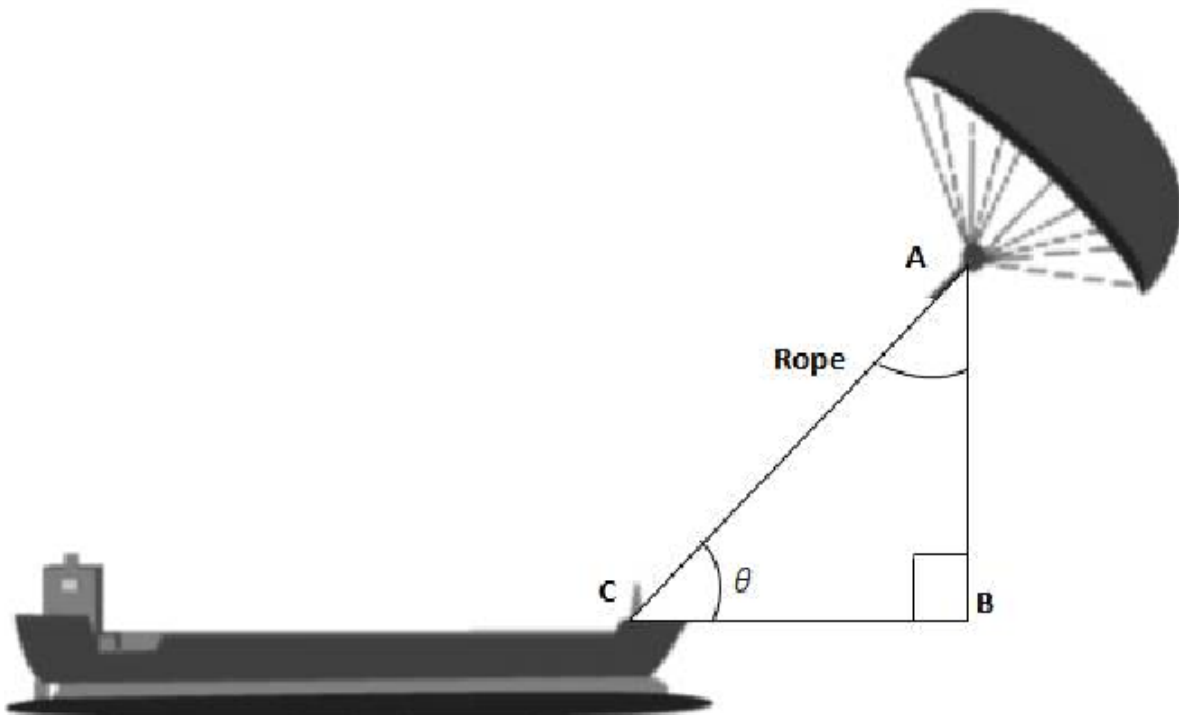
7. **A statue 2 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point the angle of elevation of the top of the pedestal is 45° . Find the height of the pedestal. (Use $\sqrt{3} = 1.73$)**
8. The rod AC of a TV disc antenna is fixed at right angle to the wall AB and a rod CD is supporting the disc as shown in Fig. 4. If AC = 1.5m long and CD = 3m, find (i) $\tan\theta$ (ii) $\sec\theta + \operatorname{cosec}\theta$.
9. A vertical tower stands on a horizontal plane and is surmounted by a vertical flag-staff of height 6 m. At a point on the plane, the angle of elevation of the bottom and top of the flag-staff are 30° and 45° respectively. Find the height of the tower. (Take $\sqrt{3} = 1.73$)
10. From the top of a 7 m high building the angle of elevation of the top of a tower is 60° and the angle of depression of its foot is 45° . Determine the height of the tower.
11. From a point on the ground, the angles of elevation of the bottom and the top of a tower fixed at the top of a 20 m high building are 45° and 60° respectively. Find the height of the tower.
12. The angle of elevation of the top of a building from the foot of a tower is 30° and the angle of elevation of the top of a tower from the foot of the building is 60° . If the tower is 50 m high, then find the height of the building.
13. If the angle of elevation of a cloud from a point 10 metres above a lake is 30° and the angle of depression of its reflection in the lake is 60° , find the height of the cloud from the surface of lake.
14. **A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30° , which is approaching the foot of the tower with a uniform speed. After covering a distance of 50 m, the angle of depression of the car becomes 60° . Find the height of the tower. (Use $\sqrt{3} = 1.73$).**

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15. The angle of elevation of an airplane from point A on the ground is 60° . After a flight of 10 seconds, on the same height, the angle of elevation from point A becomes 30° . If the airplane is flying at the speed of 720 km/hr, find the constant height at which the airplane is flying.
16. From the top of a 7 m building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45° . Determine the height of the tower. (Use $\sqrt{3} = 1.73$)
17. 'Skysails' is that genre of engineering science that uses extensive utilization of wind energy to move a vessel in the sea water. The 'Skysails' technology allows the towing kite to gain a height of anything between 100 metres – 300 metres. The sailing kite is made in such a way that it can be raised to its proper elevation and then brought back with the help of a 'telescopic mast' that enables the kite to be raised properly and effectively.

Based on the following figure related to sky sailing, answer the questions:

- (i) In the given figure, if $\sin \theta = \cos (3\theta - 30^\circ)$, where θ and $3\theta - 30^\circ$ are acute angles, then find the value of θ .
- (ii) What should be the length of the rope of the kite sail in order to pull the ship at the angle θ (calculated above) and be at a vertical height of 200 m?



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17. The angle of elevation of an airplane from a point on the ground is 60° . After a flight of 30 seconds, the angle of elevation becomes 30° . If the airplane is flying at a constant height of $3000\sqrt{3}$ m, find the speed of the airplane.

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