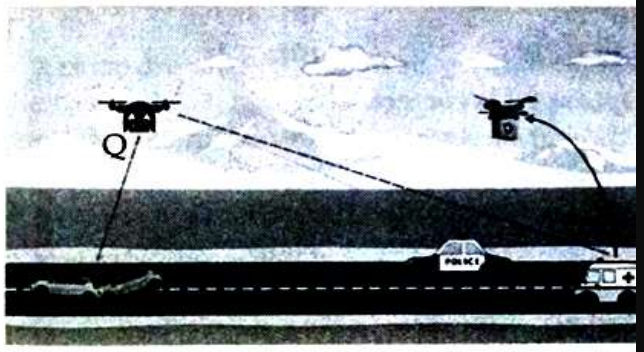
APPLICATION OF TRIGONOMETRY PYQ'S 2025,2024,2023

2025

A drone was used to facilitate movement of an ambulance on the straight highway to a point P on the ground where there was an accident.

The ambulance was travelling at the speed of 60 km/h. The drone stopped at a point Q, 100 m vertically above the point P. The angle of depression of the ambulance was found to be 30° at a particular instant.

[2025]



Based on above information, answer the foll questions:

(i) Represent the above situation with the help diagram.

(ii) Find the distance between the ambulance ar site of accident (P) at the particular instant $\sqrt{3} = 1.73$)

(iii) **(A)** Find the time (in seconds) in which the ar depression changes from 30° to 45°.

OR

(B) How long (in seconds) will the ambulance take to reach point P from a point T on the highway such that angle of depression of the ambulance at T is 60° from the drone? **2**

The Statue of Unity situated in Gujarat is the world's largest Statue which stands over a 58 m high base. As part of the project, a student constructed an inclinometer and wishes to find the height of Statue of Unity using it. [2025]

He noted following observations from two places:

Situation - I:

The angle of elevation of the top of Statue from Place A which is $80\sqrt{3}$ m away from the base of the Statue is found to be 60°.

Situation - II:

The angle of elevation of the top of Statue from a Place B which is 40 m above the ground is found to be 30° and entire height of the Statue including the base is found to be 240 m.

Based on given information, answer the following questions :

(i) Represent the Situation – I with the help of a diagram. **1**

(ii) Represent the Situation – II with the help of a diagram. **1**

(iii) **(a)** Calculate the height of Statue excluding the base and also find the height including the base with the help of Situation-I. **2**

Find the horizontal distance of Point B (Situation - II) from the Statue and the value of tan α, where α is the angle of elevation of top of base of the Statue from Point B. **2**

2024

A peacock sitting on the top of a tree of height 10 m observes a snake moving on the ground. If the snake is $10\sqrt{3}$ m away from the base of the tree, then angle of depression of the snake from the eye of the peacock is **1**

(a) 30° **(b)** 45°

(c) 60° **(d)** 90°

[2024]

A pole 6 m high is fixed on the top of a tower. The angle of elevation of the top of the pole observed from a point P on the ground is 60° and the angle of depression of the point P from the top of the tower is 45°. Find the height of the tower and the distance of point P from the foot of the tower. [2024]

(use $\sqrt{3} = 1.73$)

From the top of a 15 m high building, the angle of elevation of the top of a tower is found to be 30°. From the bottom of the same building, the angle of elevation of the top of the tower is found to be 60°. Find the height of the tower and the distance between tower and the building. [2024]

From the top of a 45 m high light house, the angles of depression of two ships, on the opposite side of it, are observed to be 30° and 60°. If the line joining the ships passes through the foot of the light house, find the distance between the ships. (Use $\sqrt{3} = 1.73$) [2024]

The angle of elevation of an aircraft from a point A on the ground is 60°. After a flight of 30 seconds, the angle of elevation changes to 30°. The aircraft is flying at a constant height of $3500\sqrt{3}$ m at a uniform speed. Find the speed of the aircraft. [2024]

2023

If a pole 6 m high casts a shadow $2\sqrt{3}$ m long on the ground, then sun's elevation is:

(a) 60°
(b) 45°
(c) 30°
(d) 90°

[2023]

(A) A straight highway leads to the foot of a tower. A man standing on the top of the 75 m high tower observes two cars at angles of depression of 30° and 60°, which are approaching the foot of the tower. If one car is exactly behind the other on the same side of the tower, find the distance between the two cars. (Use $\sqrt{3} = 1.73$) [2023]

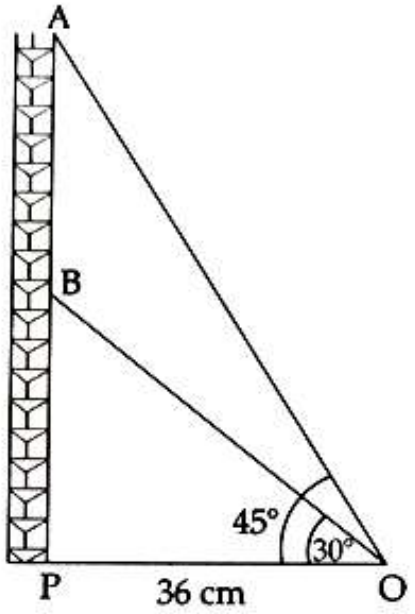
OR

(B) From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 30°. Determine the height of the tower.

Find the length of the shadow on the ground of a pole of height 18 m when angle of elevation θ of the sun is such that $\tan\theta = \frac{6}{7}$. [2023]

Radio towers are used for transmitting a range of communication services including radio and television. The tower will either act as an antenna itself or support one or more antennas on its structure. On a similar concept, a radio station tower was built in two Sections A and B. Tower is supported by wires from a point O.

Distance between the base of the tower and point O is 36 cm. From point O, the angle of elevation of the top of the Section B is 30° and the angle of elevation of the top of Section A is 45°. [2023]



[2023]

Based on the above information, answer the following questions:

(i) Find the length of the wire from the point O to the top of section B.

(ii) Find the distance AB.

OR

Find the area of ΔOPB.

(iii) Find the height of the Section A from the base of the tower.