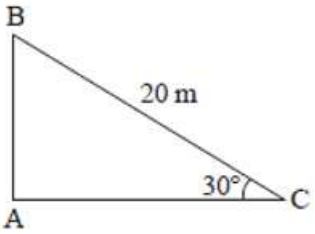
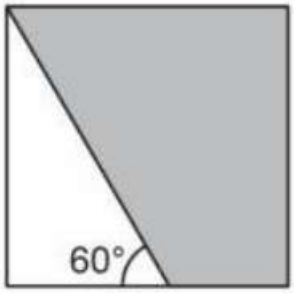
INDIAN SCHOOL AL WADI AL KABIR

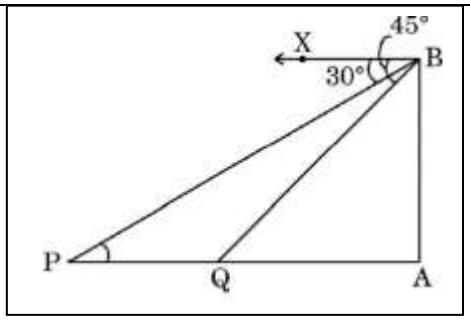
Class X, Mathematics

Worksheet-Some Applications of Trigonometry (DTQ) -

13- 10 - 2026

Q. No.	Questions of 2 marks each
1.	In the Figure, a tightly stretched rope of length 20 m is tied from the top of a vertical pole to the ground. Find the height of the pole if the angle made by the rope with the ground is 30°. 
2.	From the top of a 25 m high tower, the angle of depression of an object on the ground is 30^0. Find the distance of the object from the foot of the tower.
3.	Two poles of heights h_1 m and h_2 m subtend angles of 60° and 30° respectively at the midpoint of the line joining their feet. Find the ratio $h_1 : h_2$.
4.	Seaweed is found under an 80 m deep seafloor. To reach it a diver makes a 45° dive from a boat. What is the distance travelled by the diver to reach the seafloor?
5.	A tree is broken by the wind. The top struck the ground at an angle of $30^0$and at a distance of 30 m from the root. Find the height of the whole tree.
	Questions of 3 marks each
6.	A man in a boat rowing away from a light house 100 m high takes 2 minutes to change the angle of elevation of the top of the light house from 60° to 30°. Find the speed of the boat in metres per minute. [Use $\sqrt{3} = 1.732$]
7.	Amit, standing on a horizontal plane, finds a bird flying at a distance of 200 m from him at an elevation of 30°. Deepak standing on the roof of a 50 m high building, finds the angle of elevation of the same bird to be 45°. Amit and Deepak are on opposite sides of the bird. Find the distance of the bird from Deepak.
8.	The shadow of a tower standing on a level ground is found to be 40 m longer when the Sun's altitude is 30° than when it was 60°. Find the height of the tower. (Given $\sqrt{3} = 1.732$)

9.	A moving boat is observed from the top of a 150 m high cliff moving away from the cliff. The angle of depression of the boat changes from 60° to 45° in 2 minutes. Find the speed of the boat in m/min.
10.	There are two poles, one each on either bank of a river just opposite to each other. One pole is 60 m high. From the top of this pole, the angle of depression of the top and foot of the other pole are 30° and 60° respectively. Find the width of the river and height of the other pole
11.	A triangle is drawn inside a square of side length 6 cm as shown in figure given below. What is the area of the shaded region? 
Questions of 5 marks each	
12.	Two ships are sailing in the sea on either side of a lighthouse. The angles of depression to the two ships as observed from the top of the lighthouse are 60^0 and 45^0 , respectively. If the distance between the ships is $100\left(\frac{1+\sqrt{3}}{3}\right)$ m, then find the height of the lighthouse.
13.	The angles of depression of the top and the bottom of an 8 m tall building from the top of another multi-storeyed building are 30^0 and 45^0 , respectively. Find the height of the multi-storeyed building and the distance between the two buildings.
14.	The angle of elevation of a cloud from a point 60 m above the surface of the water of a lake is 30° and the angle of depression of its shadow in water of lake is 60°. Find the height of the cloud from the surface of water.
Questions of 4 marks each- Case Study Based	
15.	A lighthouse stands tall on a cliff by the sea, watching over ships that pass by. One day a ship is seen approaching the shore and from the top of the lighthouse, the angles of depression of the ship are observed to be 30^0 and 45^0 as it moves from point P to point Q. The height of the lighthouse is 50 m. 



Based on the information given above, answer the following questions :

(i) Find the distance of the ship from the base of the lighthouse when it is at point Q, where the angle of depression is 45^0 .

(ii) Find the measures of ∠PBA and ∠QBA.

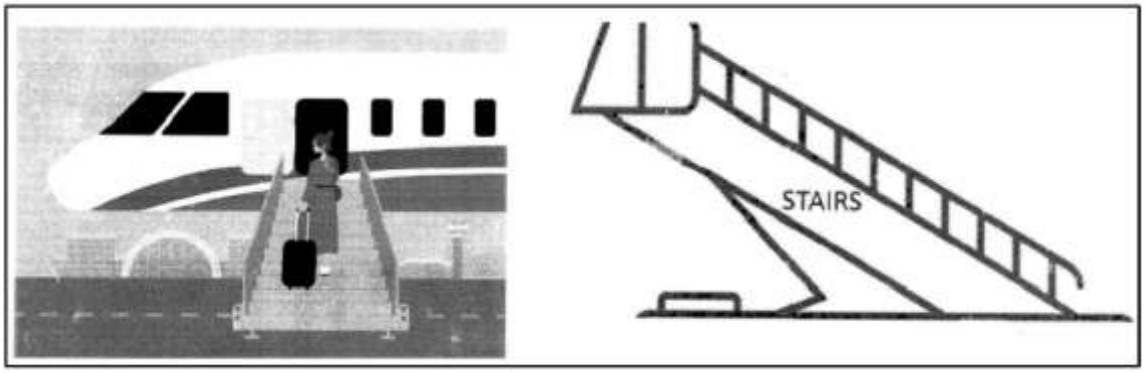
(iii) (a) Find the distance travelled by the ship between points P and Q.

OR

(b) If the ship continues moving towards the shore and takes10 minutes to travel from Q to A, calculate the speed of the ship in km/h, from Q to A.

16. Passenger boarding stairs, sometimes referred to as boarding ramps, stair cars or aircraft steps, provide a mobile means to travel between the aircraft doors and the ground. Larger aircraft have door sills 5 to 20 feet (1 foot = 30 cm) high. Stairs facilitate safe boarding and de-boarding.

An aircraft has a door sill at a height of 15 feet above the ground. A stair car is placed at a horizontal distance of 15 feet from the plane.



Based on given information, answer the questions given in part (i) and (ii).

(i) Find the angle at which stairs are inclined to reach the door sill 15 feet high above the ground.

(ii) Find the length of stairs used to reach the door sill.

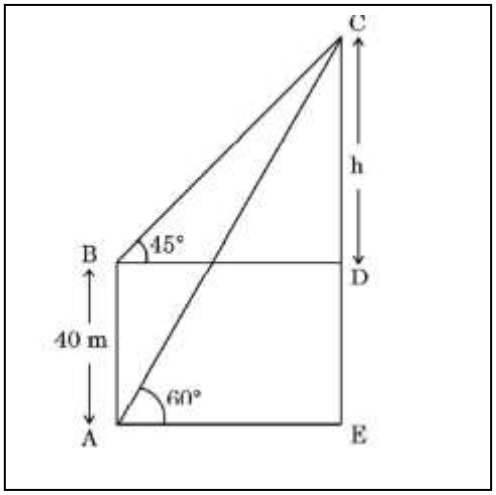
Further, answer any **one** of the following questions:

(iii) (a) If the 20 feet long stairs is inclined at an angle of 60° to reach the door sill, then find the height of the door sill above the ground. (use $\sqrt{3}$ = 1.732)

OR

(iii) (b) What should be the shortest possible length of stairs to reach the door sill of the plane 20 feet above the ground, if the angle of elevation cannot exceed 30°? Also, find the horizontal distance of base of stair car from the plane.

17. Amrita stood near the base of a lighthouse, gazing up at its towering height. She measured the angle of elevation to the top and found it to be 60^0 . Then, she climbed a nearby observation deck, 40 metres higher than her original position and noticed the angle of elevation to the top of lighthouse to be 45^0 .



Based on the above given information, answer the following questions :

(i) If CD is h metres, find the distance BD in terms of 'h'.

(ii) Find distance BC in terms of 'h'.

(iii) (a) Find the height CE of the lighthouse [Use $\sqrt{3}$= 1·73]

OR

(iii) (b) Find distance AE, if AC = 100 m.



Answers

Answers

1	10m	**2**	$25\sqrt{3}$m	**3**	3:1	**4**	$80\sqrt{2}$ m
5	$30\sqrt{3}$m	**6**	57.73 m/min	**7**	$50\sqrt{2}$ m	**8**	34.64 m
9	(75 -25 $\sqrt{3}$)m /minutes or 31.7 m/minutes)	**10**	$20\sqrt{3}$ m, 40 m	**11**	(36 - $6\sqrt{3}$) cm^2	**12**	100 m
13	(12 + 4√3) m ,(12 + 4√3) m	**14**	120 m	**15**	(i) 50m (ii)(a)∠PBA=60° ∠QBA=45° (iii)(a) 50(√3−1) m *or* 36.5 m **OR** (b) 0.3 km/h	**16**	(i)45° (ii)15 √2 ft. or 21.21 ft. approx (iii)(a)17.32 ft. OR (b)20 √3 ft. or 34.64 ft. approx
17	(i)h m (ii)$\sqrt{2}$h m (iii)94.6 m OR 50 m						