INDIAN SCHOOL NIZWA - WORKSHEET

MATHEMATICS

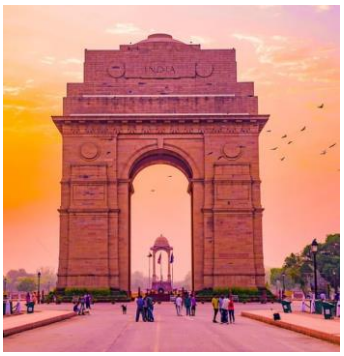
9. Application to Trigonometry

Name: _____ Date:_____ Class: X Sec: ___

1.	At some time of the day, the length of the shadow of a tower is equal to its height. Then the Sun's angle of elevation at that time is _____.
2.	If flagstaff 6m high placed on the top of a tower throws a shadow $2\sqrt{3}m$ along the ground, then the angle of elevation of the Sun is _____.
3.	A kite is flying at a height of 30m from the ground. The length of string from the kite to the ground is 60m. Assuming that there is no slack in the string, the angle of elevation of the kite to the ground is _____.
4.	An observer 1.5m tall is 20.5m away from a tower 22m high. Determine the angle of elevation of the top of the tower from the eye of the observer.
5.	The angle of depression of two ships from the top of a light house on the same side of it are found to be 45^0 and 30^0. If the ships are 200m apart, then find the height of the light house.
6.	From the top of a tower 100m high, a man observes two cars on the opposite sides of the tower with angles of depression 30^0 and 45^0 respectively. Find the distance between the cars. [use $\sqrt{3} = 1.732$]
7.	As observed from the top of light house, 50 m above sea level the angle of depression of ship, sailing directly towards it, changes from 30^0 to 45^0. Determine the distance travelled by the ship.
8.	Two lamp posts are of equal height. A boy measured the elevation of the top of each lamp-post from the mid-point of the line-segment joining the feet of lamp-post as 30^0. After walking 15m towards one of them, he measured the elevation of the top of the neasrest lamp-post at the point where he stands as 60^0. Determine the height of each lamp-post and the distance between them.
9.	The angleof elevation of the top of a tower at a distance of 120m from a point A on the ground is 45^0. If the angle of elevation of the top of a flagstaff fixed at the top of the tower, from A is 60^0, then find the height of the flagstaff. [Use $\sqrt{3} = 1.732$]
10.	**HIGHER ORDER THINKING QUESTION:** A man standing on the deck of a ship, which is 10m above the water level, observes the angle of elevation of the top of a hill as 60^0 and the angle of depression of the base of the hill as 30^0. Calculate the distance of the hill from the ship and the height of the hill.
11.	A boy standing on a horizontal plane finds a bird flying at a distance of 100m from him at an elevation of 30^0. A girl standing on the roof of 20m high building, finds the angle of elevation of the same bird to be 45^0. Both the boy and the girl are on opposite sides of the bird. Find the distance of bird from the girl. [use $\sqrt{2} = 1.414$].

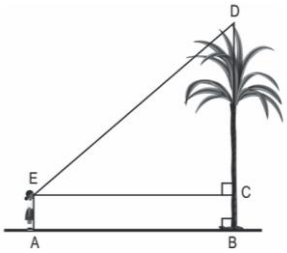
CASE STUDY

12. A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919. The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is about 138 feet (42 metres) in height.

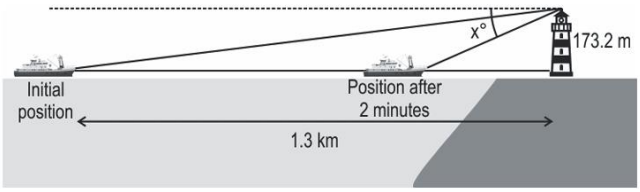


i) What is the angle of elevation if they are standing at a distance of 42m away from the monument?
ii) They want to see the tower at an angle of 60^0 . So, they want to know the distance where they should stand and hence find the distance.
iii) If the altitude of the Sun is at 60^0 , then the height of the vertical tower that will cast a shadow of length 20 m is_____
iv) The ratio of the length of a rod and its shadow is 1:1 .The angle of elevation of the Sun is_____.

13. In the given figure, the height of the girl is 1.5m and the height of the tree is 13.5 m.If AB=$12\sqrt{3}$m, what is the angle of elevation of th etop of the tree from her eyes?



14. A ship was moving towards the shore at a uniform speed of 36km/hr. Initially, the ship was 1.3km away from the foot of a lighthouse which is 173.2m in height.



Find the angle of depression, x, of the top of the lighthouse from the ship after the ship had been moving for 2 min. [Take $\sqrt{3} = 1.732 \ \ and \ \sqrt{2} = 1.414$]