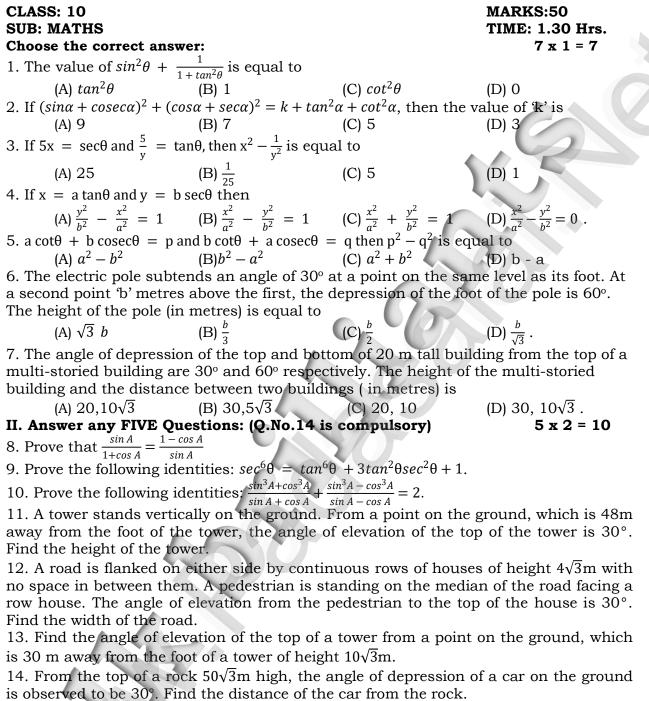
TRIGONEMETRY UNIT TEST



III. Answer any FIVE Questions: (Q.No.21 is compulsory)

 $5 \ge 5 = 25$

15. If $\cos \theta + \sin \theta = \sqrt{2} \cos \theta$, then prove that $\cos \theta - \sin \theta = \sqrt{2} \sin \theta$.

16. Prove that
$$\frac{\sin A}{1 + \cos A} + \frac{\sin A}{1 - \cos A} = 2 \operatorname{cosec} A$$

17. If $\frac{\cos \alpha}{\cos \beta} = m$ and $\frac{1 + \cos A}{\sin \beta} = n$, then prove that $(m^2 + n^2)\cos^2\beta = n^2$.

18. Two ships are sailing in the sea on either sides of a lighthouse. The angle of elevation of the top of the lighthouse as observed from the ships are 30° and 45° respectively. If the lighthouse is 200 m high, find the distance between the two ships.

19. A man is watching a boat speeding away from the top of a tower. The boat makes an angle of depression of 60° with the men's eye when at a distance of 200 m from the tower. After 10 seconds, the angle of depression become 45° . What is the approximate speed of boat (in km/hr), assuming that it is sailing in still water?

20. An aeroplane at an altitude of 1800 m finds that two boats are sailing towards it in the same direction. The angles of depression of the boats as observed from the aeroplane are 60° and 30° respectively. Find the distance between the two boats.

21. A man is standing on the deck of a ship, which is 40 m above water level. He observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of the hill as 30° . Calculate the distance of the hill from the ship and the height of the hill.

IV. Answer all the question:

$1 \ge 8 = 8$

22. Draw the two tangents from a point which 5 cm away from the centre of a circle of diameter 6cm. Also, measure the length of the tangents. (OR)

A company initially started with 40 workers to complete the work by 150 days. Later, it decided to fasten up the work increasing the number of workers as shown below:

Number of workers (x)	40	50	60	75
Number of days (y)	150	120	100	80
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(i) Graph the above data and identify the type of variation.

(ii) From the graph, find the number of days required to complete the work if the company decides to opt for 120 workers?

(iii) If the work has to be completed by 30 days, how many workers are required?