1. If Sec $\theta = \frac{25}{7}$, Find the value of tan θ and cosec θ.

2. In $\triangle ABC$, right angle at B, if AB=12 cm and BC=5cm, find (i) sin A and tan A, (ii) sin C and cot C.

3. If 3 tan θ =4, find the value of $\frac{5 \sin \theta - 3 \cos \theta}{5 \sin \theta + 2 \cos \theta}$.

4. In a triangle ABC, right angled at B, the ratio of AB to AC is 1: $\sqrt{2}$. Find the value of $\frac{2 tan A}{1 + \tan^2 A}$.

5. In the figure below, $\triangle ABC$ is right angled at b, BC=7 cm and AC-AB=1 cm. Find the value of cos A+sin A.

6. If sin θ=x and sec θ=y, then find the value of cot θ.

7. $\triangle RPO$ is a right angled at Q. If PQ=5cm and RQ=10cm, find: (i) sin P (ii) cos^2 R and tan R (iii) sin P x cos P (iv) sin^{2}P – cos^2 P.

8. If sin θ = cos θ, find the value of θ.

9. If tan $\theta = \frac{1}{\sqrt{3}}$, then evalueate $\left[\frac{\cosec^2 \theta - \sec^2 \theta}{\cosec^2 \theta + \sec^2 \theta}\right]$

10. If sin (A-B) $= \frac{1}{2}$, cos (A+B) $= \frac{1}{2}$, find A and B.

11. If $\sqrt{3}$ sin θ – cos θ =0 and 0° <90°, find the value of θ.

12. If A=60° and B=30°, verify that sin(A-B) = sin A cos B – cos A sin B.

13. Evaluate : 4 cot^2 45° - sec^2 60° + cos^2 90°.

14. Evaluate: $\frac{2 \cos^2 90° + 4\cos^2 45° + \tan^2 60° + 3\cosec^2 60° + 1}{3 \sec 60° - \frac{7}{2} \cos^2 45° + 2 \ cccosec \ 30° - 1}$

15. Evaluate : $\frac{4}{\cot^2 30°} + \frac{1}{\sin^2 60°}$ - $\cos^2 45°$

16. If tan $\frac{5\theta}{2} = \sqrt{3}$ and θ is acute, then find the value of 2θ.

17. If $\sqrt{3}$ sin θ = cos θ, find the value of $\frac{3\cos^2 \theta + 2 \cos^2 \theta}{3 \cos^2 \theta + 2}$

18. Find the value of θ (0° < θ <90 °) if 2 $\cos^2 \theta = \frac{1}{2}$.

19. If sin A = cos A, find the value of 2 tan^{2}A + sin^2 - 1.

20. In an acute angled triangle ABC, if sin (A+B-C) = $\frac{1}{2}$ and cos (B+C-A) = $\frac{1}{\sqrt{2}}$, find $\angle$A, $\angle$B and $\angle$C.

21. Give that cos (A-B) = cos A. cos B + sin A.sin B, find the value of cos 15° in two ways.
    (i)   Taking A = 60°, B = 45° and
    (ii)   Taking A = 45° and b = 30°

22. If sec A$=\frac{15}{7}$ and A+B=90°, find the value of cosec B.

23. Prove without using trigonometric tables: sin^2 5° + sin^2 10° + ... + sin^2 85° + sin^2 90° $=9\frac{1}{2}$
    [HOTS]

24. Prove without using trigonometric tables: $\frac{\cos (90°) - A).\sin (90° - A)}{\tan (90° - A)} = \sin^2 A$

25. Prove without using trigonometric tables: tan 10° .tan 75° .tan 15° .tan80° = 1

26. Evaluate : $\frac{\sec^2 (90° - \theta) - \cot^2 \theta}{2(\sin^2 25° + \sin^2 65°}$ + $\frac{2\sin^2 30° \tan^2 32° .\tan^2 58°}{3(\sec^2 33° - \cot^2 57°)}$

27. If A+B=90°, Prove that $\sqrt{\frac{\tan A \tan B + \tan A \cot B}{\sin A \sec B}} - \frac{\sin^2 B}{\cos^2 A} = \tan A$

28. Find tan (65° - θ) – cot(25° + θ)

29. Find the value of sin 38°- cos 52°

30. Evaluate: sin θ.sec (90°- θ)

ASSIGNMENT ,CLASS X

MATHEMATICS

CHAPTER-9 APPLICATION OF TRIGONOMETERY

Q:1   If the height of the shadow of a man are the same , then find the angle of elevation of the sun.

(45^0)

Q:2   A pole 10m high casts a shadow 10m long on the ground. What is the elevation of the sun?

(45^0)

Q:3   A ladder, leaning against a wall , makes an angle of 60^0 with the horizontal . If the foot of the ladder is 2.5 m away from the wall , find the length of the ladder.   (5 m)

Q:4   A ladder 15 m long just reaches the top of a vertical wall. If the ladder makes an angle   of 60^0 with the wall, Find the height of the wall.   (7.5 m)

Q:5   What are the angles of depression of the object at E from the observation point A if

AD = ED ? (45^0)

Q:6   If the length of the shadow of a tower is $\sqrt{3}$ times its height, then find the angle of the elevation of the sun. (30^0)

Q:7   Find the length of the shadow on the ground of a pole of height 6m when the angle of elevation θ of the sun is such that $\tan \theta$ = ¾   (8 m)

Q:8   The angle of depression of car parked on the road from the top of a 150 m high tower 30^0. Find the distance of the car from the tower. $(150\sqrt{3})$

Q:9   An observer 1.5 m tall is 20.5 m away from a tower 22m high. Determine the angle of elevation of the top of the tower from the eye of the observer. (45^0)

Q:10   The angle of elevation of an aeroplane from a point on the ground is 60^0. After a flight of 15 seconds , the angle of elevation changes to 30^0. If the aeroplane is flying at a constant height of 1500 $\sqrt{3}$ m , find the speed of the plane in km/hr.   (720km/hr)

Q:11   The angle of elevation of the top Q of a vertical tower PQ from a point X on the ground is 60^0. From a point Y , 40 m vertically above X, the angle of elevation of the top Q of tower is 45^0. Find the height of the tower PQ and the distance PX.   (94.46, 54.6)

Q:12   A boy Harpreet Singh standing on the top of a hotel, which is on the sea shore. Finds that a boat coming towards him takes 10 minutes for the angle of depression to change from 30^0 to 60^0. How soon will the boat reach the sea shore ?   (15 minutes)

Q:13   A boy whose eye-level is 1.3 m from the ground , spots a balloon moving with the wind in a horizontal line at some height from the ground. The angle of elevation of the balloon from the eyes of the boy at an instant is 60^0 . After 2 seconds , the angle of elevation reduces to 30^0 . If the speed of the wind is $29\sqrt{3}$ m/s , then find the height of the balloon from the ground.(88.3m)