CBSE

INTRODUCTION TO TRIGONOMETRY WS 3

Class 10 - Mathematics

1. If $\cos\theta = \frac{3}{4}$, then find the value of 9 $\tan^2\theta$ + 9. **[2]**
2. If 3 tan θ = 4, evaluate $\frac{3\sin\theta+2\cos\theta}{3\sin\theta-2\cos\theta}$. **[2]**
3. Match the following: **[2]**

(a) If tanθ = $\sqrt{\frac{2}{3}}$, then $5sin^2\theta$	(i) 3
(b) If tanθ = $\sqrt{\frac{2}{3}}$, then $5cos^2\theta$	(ii) 6
(c) If tanθ = $\sqrt{\frac{2}{3}}$, then $3sec^2\theta$	(iii) 2
(d) If tanθ = $\sqrt{\frac{2}{3}}$, then $4cot^2\theta$	(iv) 5

4. Match the following: **[2]**

Column1	Column 2
(a) In right $\triangle ABC, \angle ABC = \theta$, AB is base, $tan\theta$ =	(i) $\frac{AB}{BC}$
(b) In right$\triangle ABC, \angle ABC = \theta$, AB is base,$cot\theta$ =	(ii) $\frac{AC}{BC}$
(c) In right$\triangle ABC, \angle ABC = \theta$, AB is base,$sin\theta$ =	(iii) $\frac{AB}{AC}$
(d) In right$\triangle ABC, \angle ABC = \theta$, AB is base,$cos\theta$ =	(iv) $\frac{AC}{AB}$

5. Match the following: **[2]**

Column 1	Column 2
(a) In right $\triangle ABC, \angle ABC = \theta$, AB is base, AC=	(i) $AC.cot\theta$
(b) In right $\triangle ABC, \angle ABC = \theta$, AB is base, AB =	(ii) $BC.sin\theta$
(c) In right $\triangle ABC, \angle ABC = \theta$, AB is base, AC =	(iii) $AC.cosec\theta$
(d) In right $\triangle ABC, \angle ABC = \theta$, AB is base, BC =	(iv) $AB.tan\theta$

6. Match the following: **[2]**

(a) In the right angled $\triangle$ABC $\angle A$ = α, $\angle C$ = β and $\angle B$ is 90^o, then AB is	(i) 1
(b) In the right angled $\triangle$ABC $\angle A$ = α, $\angle C$ = β and $\angle B$ is 90^o, then BC is	(ii) $AB\ Cot\ \beta$
(c) In the right angled $\triangle$ABC $\angle A$ = α, $\angle C$ = β and $\angle B$ is 90^o, then AC is	(iii) $AC\ Sin\ \beta$
(d) In the right angled $\triangle$ABC $\angle A$ = α, $\angle C$ = β and $\angle B$ is 90^o, then $sin\ (\alpha+\beta)$ is	(iv) $AB\ cosec\ \beta$

7. Match the following: **[2]**

Column 1	Column 2
(a) Trigonometric identity is applicable only on	(i) Pythagoras Theorem

(b) If two sides are given in right triangle than the third side can be calculated with the help of	(ii) Right triangle
(c) If one side and one angle is given in the right triangle than the third side can be calculated by	(iii) Equal
(d)If the angles are equal in a right triangle than its two sides are	(iv) Trigonometric functions

8. Match the following: **[2]**

(a) If $CosA = \frac{4}{5}$, then $sinA$	(i) $\frac{5}{3}$
(b) If $CosA = \frac{4}{5}$,then $tanA$	(ii) $\frac{3}{5}$
(c) If $CosA = \frac{4}{5}$, then $cotA$	(iii) $\frac{3}{4}$
(d) If $CosA = \frac{4}{5}$, then $cosecA$	(iv) $\frac{4}{3}$

9. If A and B are acute angles such that tan A = $\frac{1}{3}$, tan B = $\frac{1}{2}$ and tan (A + B) = $\frac{\tan A+\tan B}{1-\tan A \tan B}$, show that A + B = 45°. **[2]**

10. Given tan A = $\frac{4}{3}$, find all other trigonometric ratios of the angle A. **[2]**

11. If ∠A and ∠B are acute angles such that cos A = cos B then show that ∠A = ∠B. **[2]**

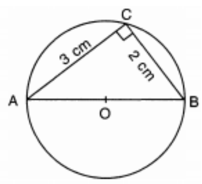
12. If $\sqrt{3}$sin θ - cosθ = 0 and 0°< θ < 90°, find the value of θ. **[2]**

13. If cotθ = $\frac{9}{40}$, find the values of cosecθ and secθ. **[2]**

14. If sinθ = $\frac{3}{5}$ find the values of other trigonometric ratios. **[2]**

15. If $\cos\theta = \frac{3}{4}$, then find the value of 9 tan$^2\theta$ + 9. **[2]**

16. In the given figure, AOB is a diameter of a circle with centre O. Find tan A tan B. **[2]**



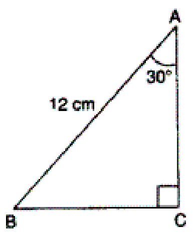
17. If tan A = $\sqrt{2}$ – 1, show that $\frac{\tan A}{1+\tan^2 A} = \frac{\sqrt{2}}{4}$ **[2]**

18. If $\cot\theta = \frac{7}{8}$, evaluate $\frac{(1+\sin\theta)(1-\sin\theta)}{(1+\cos\theta)(1-\cos\theta)}$. **[2]**

19. If θ be an acute angle and 5 cosecθ = 7, then evaluate sinθ + cos$^2\theta$ -1. **[2]**

20. If 3 cot$\theta = 4$, show that $\frac{(1-\tan^2\theta)}{(1+\tan^2\theta)} = \left(\cos^2\theta - \sin^2\theta\right)$. **[2]**

21. ABC is a triangle right angled at C. If $\angle A = 30^\circ$, AB = 12 cm, determine BC and AC. **[2]**



22. Prove that: **[2]**

$\frac{1+\tan A}{2\sin A} + \frac{1+\cot A}{2\cos A}$ = cosec A + sec A

23. If $m\cot A = n$, find the value of $\frac{m\sin A-n\cos A}{n\cos A+m\sin A}$. **[2]**

24. If 3 cot A = 4, find the value of $\frac{cosec^2 A+1}{cosec^2 A-1}$. **[2]**

25. If $\sin\theta = \frac{a}{\sqrt{a^2+b^2}}, 0 < \theta < 90^\circ$, find the values of $\cos\theta$ and $\tan\theta$ **[2]**

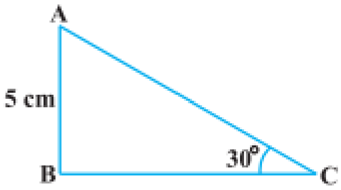
26. If $\sin A = \frac{3}{4}$, calculate cosA and tanA **[2]**

27. If 5 tan α = 4, then the value of $\frac{5\sin\alpha - 3\cos\alpha}{5\sin\alpha + 2\cos\alpha} = \frac{1}{6}$ **[2]**

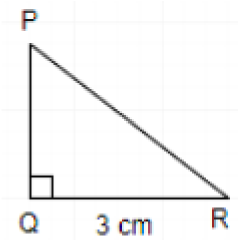
28. Express the trigonometric ratio of sec A and tan A in terms of sin A. **[2]**

29. If sinϕ= $\frac{1}{2}$, show that 3 cosϕ - 4cos$^3\phi$ = 0. **[2]**

30. In $\triangle$ABC, right-angled at B, AB = 5 cm and $\angle$ACB = 30°. Determine the lengths of sides BC and AC. **[2]**



31. In a $\triangle PQR$ right angled at Q, QR = 3 cm and PR - PQ = 1 cm. Determine the values of sin R, cos R and tan R **[2]**



32. If $\cos\theta = \frac{3}{5}$, find the value of $\cot\theta + cosec\theta$ **[2]**

33. Given $\sec\theta = \frac{13}{12}$, Calculate all other trigonometric ratios. **[2]**

34. Find A and B if sin (A + 2B) = $\frac{\sqrt{3}}{2}$ and cos (A + 4B) = 0, where A and B are acute angles. **[2]**

35. In $\triangle$ABC, right angled at A, if AB = 5, AC = 12 and BC = 13, find sin B, cos C and tan B. **[2]**

36. If $\angle A$ and $\angle B$ are acute angles such that cos A = cos B then show that $\angle A = \angle B$. **[2]**

37. If $\tan\theta = \frac{3}{4}$, find the value of $\frac{1-\cos\theta}{1+\cos\theta}$. **[2]**

38. If $\sin\theta = \frac{1}{\sqrt{2}}$, find all other trigonometric ratios of angle θ. **[2]**

39. In a right $\triangle$ABC, right-angled at B, if tanA = 1, then verify that 2sinA·cosA = 1 **[2]**

40. If 3 cot θ = 4, find the value of $\frac{4\cos\theta - \sin\theta}{2\cos\theta + \sin\theta}$ **[2]**

41. If 3cotθ = 2, show that $\frac{(4\sin\theta - 3\cos\theta)}{(2\sin\theta + 6\cos\theta)} = \frac{1}{3}$. **[2]**

42. If $\cot\theta = \frac{15}{8}$, then evaluate: $\frac{(2+2\sin\theta)(1-\sin\theta)}{(1+\cos\theta)(2-2\cos\theta)}$. **[2]**

43. If tan$\theta = \frac{20}{21}$, show that $\frac{(1-\sin\theta+\cos\theta)}{(1+\sin\theta+\cos\theta)} = \frac{3}{7}$. **[2]**

44. If sin A = $\frac{\sqrt{3}}{2}$, find the value of 2cot^2 A -1. **[2]**

45. If 4 cosθ = 11 sinθ, find the value $\frac{11\cos\theta - 7\sin\theta}{11\cos\theta + 7\sin\theta}$. **[2]**

46. If $\cos\theta = \frac{4}{5}$, find all other trigonometric ratio of angle θ. **[2]**

47. If $\angle A$ and $\angle B$ are acute angles such that cosA = cosB, then show that $\angle A = \angle B$. **[2]**

48. If $\sin A = \frac{3}{4}$, calculate cos A and tan A. **[2]**

49. If $\sqrt{2}$sinθ = 1, find the value of sec$^2\theta$ - cosec$^2\theta$. **[2]**

50. If 3tanθ = 4, evaluate $\frac{3\sin\theta + 2\cos\theta}{3\sin\theta - 2\cos\theta}$. **[2]**

51. If $\cot\theta = \frac{15}{8}$, then evaluate: $\frac{(2+2\sin\theta)(1-\sin\theta)}{(1+\cos\theta)(2-2\cos\theta)}$ **[2]**

52. If $\tan\theta = \frac{4}{5}$, find the value of $\frac{\cos\theta - \sin\theta}{\cos\theta + \sin\theta}$ **[2]**