Chapter 8

ASSIGNMENT

~~OBJECTIVE EXCERCISE - 8.1~~

1. If $\alpha+\beta=\frac{\pi}{2}$ and $\alpha=\frac{1}{3}$, then sin β is

   (A) $\frac{\sqrt{2}}{3}$ (B) $\frac{2\sqrt{2}}{3}$ (C) $\frac{2}{3}$ (D) $\frac{3}{4}$

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

   (A) $\frac{1}{3}$ (B) $\frac{1}{6}$ (C) $\frac{4}{5}$ (D) $\frac{2}{3}$

3. If $7\sin\alpha=24\cos\alpha; 0<\alpha<\frac{\pi}{2}$, then value of $14\tan\alpha-75\cos\alpha-7\sec\alpha$ is equal to

   (A) 1 (B) 2 (C) 3 (D) 4

4. Given $3\beta+5\cos\alpha;\ \beta=5$, then the value of $(3\cos\beta-5\sin\beta)^2$ is equal to

   (A) 9 (B) $\frac{9}{5}$ (C) $\frac{1}{3}$ (D) $\frac{1}{9}$

5. If $\tan\theta=4$, then $\left(\frac{\tan\theta}{\frac{\sin^3\theta}{\cos\theta}+\sin\theta\cos\theta}\right)$ is equal to

   (A) 0 (B) $2\sqrt{2}$ (C) $\sqrt{2}$ (D) 1

6. The value of $\tan 5^0 \tan 10^0 \tan 15^0 20^0$ .... $\tan 85^0$, is

   (A) 1 (B) 2 (C) 3 (D) None of these

7. As x increases from 0 to $\frac{\pi}{2}$ the value of cos x

   (A) increases (B) decreases

   (C) remains constant (D) increases, then decreases

8. Find the value of x from the equation $x\sin\frac{\pi}{6}\cos^2\frac{\pi}{4}=\frac{\cot^2\frac{\pi}{6}\sec\frac{\pi}{3}\tan\frac{\pi}{4}}{\operatorname{cosec}^2\frac{\pi}{4}\operatorname{cosec}\frac{\pi}{6}}$

   (A) 4 (B) 6 (C) - 2 (D) 0

9. The area of a triangle is 12 sq. cm. Two sides are 6 cm and 12 cm. The included angle is

(A) $\cos^{-1}\left(\frac{1}{3}\right)$ (B) $\cos^{-1}\left(\frac{1}{6}\right)$ (C) $\sin^{-1}\left(\frac{1}{6}\right)$ (D) $\sin^{-1}\left(\frac{1}{3}\right)$

10. If $\alpha+\beta=90^0$ and $\alpha=2\beta$ then $\cos^2\alpha+\sin^2\beta$ equals to

(A) $\frac{1}{2}$ (B) 0 (C) 1 (D) 2

SUBJECTIVE ASSIGNMENT - 8.2

1. Evaluate :

(A) $\frac{\sin\theta\cos\theta\sin(90^0-\theta)}{\cos(90^0-\theta)}+\frac{\cos\theta\sin\theta\cos(90^0-\theta)}{\sin(90^0-\theta)}+\frac{\sin^2 27^0+\sin^2 63^0}{\cos^2 40^0+\cos^2 50^0}$

(B) $\cos 10^0\cos 2^0\cos 3^0 - - - - - - - \cos 180^0$

(C) $\sin(50^0+\theta)-\cos(40^0-\theta)+\tan 1^0\tan 20^0\tan 70^0\tan 80^0\tan 89^0$

(D) $\frac{2}{3}(\cos^4 30^0-\sin^4 45^0)-3(\sin^2 60^0-\sec^2 45^0)+\frac{1}{4}\cot^2 30^0$

(E) $\frac{\cos^2 20^0+\cos^2 70^0}{\sec^2 50-\cot^2 40^0}+2\cos ec^2 58^0-2\cot 58^0\tan 32^0-4\tan 13^0\tan 37^0\tan 45^0\tan 53^0\tan 77^0$

2. If $\cot\theta=\frac{3}{4}$, prove that $\sqrt{\frac{\sec\theta-\cos ec\theta}{\sec\theta+\cos ec\theta}}=\frac{1}{\sqrt{7}}$.

3. If A + B = 90^0, prove that :

$$\sqrt{\frac{\tan A\tan B+\tan A\cot B}{\sin A\sec B}-\frac{\sin^2 B}{\cos^2 A}}=\tan A$$

4. If A, B, C are the interior angles of a Δ ABC, show that :

(i) $\sin\frac{B+C}{2}=\cos\frac{A}{2}$ (ii) $\cos\frac{B+C}{2}=\sin\frac{A}{2}$

Prove the following (Q, 5 to Q. 13)

5. $\tan^2\theta-\sin^2\theta=\tan^2\theta\sin^2\theta$

6. $(\sin\theta+\cos ec\theta)+(\cos\theta+\sec\theta)^2=7+\tan^2\theta+\cot^2\theta$ **[CBSE - 2008]**

7. $\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=\sec\theta\cos ec\theta+1$

8. $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = \sec\theta - \tan\theta$

9. $\frac{\sin A+\cos A}{\sin A+\cos A} + \frac{\sin A-\cos A}{\sin A+\cos A} = \frac{2}{\sin^2 A-\cos^2 A} = \frac{2}{1-2\cos^2 A}$

10. $(\sin\theta+\sec\theta)^2 + (\cos\theta+\cos ec\theta)^2 = (1+\sec\theta\cos ec\theta)^2$

11. $(1+\cot\theta-\cos ec\theta)(1+\tan\theta+\sec\theta) = 2$

12. $(\sin^8\theta-\cos^8\theta) = (\sin^2\theta-\cos^2\theta)(1-2\sin^2\theta\cos^2\theta)$

13. $\frac{\tan\theta+\sec\theta-1}{\tan\theta-\sec\theta+1} = \frac{1+\sin\theta}{\cos\theta}$

14. If $x = r\sin\theta\cos\phi$, $y = r\sin\theta\sin\phi$, $z = r\cos\theta$, then Prove that : $x^2 + y^2 + z^2 = r^2$.

15. If $\cot\theta + \tan\theta = x$ and $\sec\theta - \cos\theta = y$, then prove that $(x^2y)^{2/3} - (xy^2)^{2/3} = 1$

16. If $\sec\theta + \tan\theta = p$, then show that $\frac{p^2-1}{p^2+1} = \sin\theta$ **[CBSE - 2004]**

17. Prove that : $\tan^2 A - \tan^2 B = \frac{\cos^2 B-\cos^2 A}{\cos^2 B\cos^2 A} = \frac{\sin^2 A-\sin^2 B}{\sin^2 A\sin^2 B}$ **[CBSE - 2005]**

18. Prove that : $\frac{1}{\sec x-\tan x} - \frac{1}{\cos x} = \frac{1}{\cos x} = \frac{1}{\cos x} - \frac{1}{\sec x+\tan x}$ **[CBSE - 2005]**

19. Prove : $(1+\tan^2 A) + \left(1+\frac{1}{\tan^2 A}\right) = \frac{1}{\sin^2 A-\sin^4 A}$ **[CBSE - 2006]**

20. Evaluate :

$\tan 7^0 \tan 23^0 \tan 60^0 \tan 67^0 \tan 83^0 + \frac{\cot 54^0}{\tan 36^0} + \sin 20^0 \sec 70^0 - 2$. **[CBSE - 2007]**

21. Without using trigonometric tables, evaluate the following :

$(\sin^2 65^0 + \sin^2 25^0) + \sqrt{3}\ (\tan 5^0 \tan 15^0 \tan 30^0 \tan 75^0 \tan 85^0)$ **[CBSE - 2008]**

22. If $\sin 3\theta = \cos(\theta - 60^0)$ and 3θ and $\theta - 60^0$ are acute, find the value of θ **[CBSE - 2008]**

23. If $\sin\theta = \cos\theta$, find the value of θ. **[CBSE - 2008]**

24. If $7\sin^2\theta + 3\cos^2\theta = 4$, show that $\tan\theta = \frac{1}{\sqrt{3}}$ **[CBSE - 2008]**

25. Prove : $\sin\theta(1+\tan\theta) + \cos\theta(1+\cot\theta) = \sec\theta + \text{cosec}\,\theta$. **[CBSE - 2008]**