DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 2**

Topic :- TRIGONOMETRIC FUNCTIONS

1. $\left(1+\cos\frac{\pi}{8}\right)\left(1+\cos\frac{3\pi}{8}\right)\left(1+\cos\frac{5\pi}{8}\right)\left(1+\cos\frac{7\pi}{8}\right)$ is equal to

   a) $\frac{1}{2}$ b) $\cos\frac{\pi}{8}$ c) $\frac{1}{8}$ d) $\frac{1+\sqrt{2}}{2\sqrt{2}}$

2. If $2\sin\frac{A}{2}=\sqrt{1+\sin A}+\sqrt{1-\sin A}$, then $\frac{A}{2}$ lies between

   a) $2n\pi+\frac{\pi}{4}$ and $2n\pi+\frac{3\pi}{4}, n\in Z$

   b) $2n\pi-\frac{\pi}{4}$ and $2n\pi+\frac{\pi}{4}, n\in Z$

   c) $2n\pi-\frac{3\pi}{4}$ and $2n\pi-\frac{\pi}{4}, n\in Z$

   d) $-\infty$ and $+\infty$

3. In a ΔABC, if $a\cos^2\frac{C}{2}+c\cos^2\frac{A}{2}=\frac{3b}{2}$, then a,b,c are in

   a) A.P. b) G.P. c) H.P. d) None of these

4. The value of $\tan 5\theta$ is

   a) $\frac{5\tan\theta-10\tan^3\theta+\tan^5\theta}{1-10\tan^2\theta+5\tan^4\theta}$

   b) $\frac{5\tan\theta+10\tan^3\theta-\tan^5\theta}{1+10\tan^2\theta-5\tan^4\theta}$

   c) $\frac{5\tan^5\theta-10\tan^3\theta+\tan\theta}{1-10\tan^2\theta+5\tan^4\theta}$

   d) None of these

5. If the sides a,b and c of a ΔABC are in A.P., then $\left(\tan\frac{A}{2}+\tan\frac{C}{2}\right):\cot\frac{B}{2}$, is

   a) 3 :2 b) 1 :2 c) 3 :4 d) None of these

6. If in a triangle ABC

$$2\frac{\cos A}{a}+\frac{\cos B}{b}+2\frac{\cos C}{c}=\frac{a}{bc}+\frac{b}{ca},$$

then the value of the angle A is

   a) $\frac{\pi}{3}$ b) $\frac{\pi}{4}$ c) $\frac{\pi}{2}$ d) $\frac{\pi}{6}$

7. The value of $\tan\alpha+2\tan(2\alpha)+4\tan(4\alpha)+\ldots+2^{n-1}\tan(2^{n-1}\alpha)+2^n\cot(2^n\alpha)$ is

   a) $\cot(2^n\alpha)$ b) $2^n\tan(2^n\alpha)$ c) 0 d) $\cot\alpha$

8. The maximum value of $\cos^2\left(\frac{\pi}{3}-x\right)-\cos^2\left(\frac{\pi}{3}+x\right)$ is

   a) $-\frac{\sqrt{3}}{2}$ b) $\frac{1}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $\frac{3}{2}$

9. If $a=2,b=3,c=5$ in ΔABC, then $C=$

   a) $\frac{\pi}{6}$ b) $\frac{\pi}{3}$ c) $\frac{\pi}{2}$ d) None of these

10. If in a $\Delta ABC, \frac{a}{\cos A}=\frac{b}{\cos B}$, then

a) $2\sin A \sin B \sin C = 1$

b) $\sin^2 A + \sin^2 B = \sin^2 C$

c) $2\sin A \cos B = \sin C$

d) None of these

11. If $1 + \sin\theta + \sin^2\theta + ...\infty = 4 + 2\sqrt{3}$, $0 < \theta < \pi$, $\theta \neq \frac{\pi}{2}$, then

a) $\theta = \frac{\pi}{3}$ b) $\theta = \frac{\pi}{6}$ c) $\theta = \frac{\pi}{3}$ or $\frac{\pi}{6}$ d) $\theta = \frac{\pi}{3}$ or $\theta = \frac{2\pi}{3}$

12. In a ΔABC,
$a(b^2 + c^2)\cos A + b(c^2 + a^2)\cos B + c(a^2 + b^2)\cos C$ is equal to

a) abc b) $2abc$ c) $3abc$ d) $4abc$

13. If $\tan(\pi\cos\theta) = \cot(\pi\sin\theta)$, then the value of $\cos\left(\theta - \frac{\pi}{4}\right)$ is equal to

a) $\frac{1}{2\sqrt{2}}$ b) $\frac{1}{\sqrt{2}}$ c) $\frac{1}{3\sqrt{2}}$ d) $\frac{1}{4\sqrt{2}}$

14. The number of points of intersection of the two curves $y = 2\sin x$ and $y = 5x^2 + 2x + 3$, is

a) 0 b) 1 c) 2 d) ∞

15. If, in a ΔABC, $(a + b + c)(b + c - a) = \lambda\, bc$, then

a) $\lambda < 0$ b) $\lambda > 4$ c) $\lambda > 0$ d) $0 < \lambda < 4$

16. The expression $\text{cosec}^2 A\cot^2 A - \sec^2 A\tan^2 A - (\cot^2 A - \tan^2 A)(\sec^2 A\ \text{cosec}^2 A - 1)$ is equal to

a) 1 b) -1 c) 0 d) 2

17. The sides of a triangle are in A.P. and its area is $3/5$ times the area of an equilateral triangle of the same perimeter. Then, the ratio of the sides is

a) 1 :2 :3 b) 3 :5 :7 c) 1 :3 :5 d) None of these

18. If $\tan\alpha = \frac{b}{a}$, $a > b > 0$ and if $0 < \alpha < \frac{\pi}{4}$, then $\sqrt{\frac{a+b}{a-b}} - \sqrt{\frac{a-b}{a+b}}$ is equal to

a) $\frac{2\sin\alpha}{\sqrt{\cos 2\alpha}}$ b) $\frac{2\cos\alpha}{\sqrt{\cos 2\alpha}}$ c) $\frac{2\sin\alpha}{\sqrt{\sin 2\alpha}}$ d) $\frac{2\cos\alpha}{\sqrt{\sin 2\alpha}}$

19. If $\sin\theta + \cos\theta = x$, then $\sin^6\theta + \cos^6\theta = \frac{1}{4}\left[4 - 3(x^2 - 1)^2\right]$ for

a) all real x b) $x^2 \leq 2$ c) $x^2 > 2$ d) None of these

20. If in a triangle ABC, $\frac{\sin A}{\sin C} = \frac{\sin(A - B)}{\sin(B - C)}$, then

a) a,b,c are in A.P. b) a^2,b^2,c^2 are in A.P. c) a,b,c are in H.P. d) a^2,b^2,c^2 are in H.P