

# DPP

DAILY PRACTICE PROBLEMS

Class : XIth  
Date :

Subject : MATHS  
DPP No. : 2

## Topic :- TRIGONOMETRIC FUNCTIONS

1.  $(1 + \cos \frac{\pi}{8})(1 + \cos \frac{7\pi}{8})$  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  $2n\pi + \frac{3\pi}{4}$ ,  $n \in \mathbb{Z}$
  - b)  $2n\pi - \frac{\pi}{4}$  and  $2n\pi + \frac{\pi}{4}$ ,  $n \in \mathbb{Z}$
  - c)  $2n\pi - \frac{3\pi}{4}$  and  $2n\pi - \frac{\pi}{4}$ ,  $n \in \mathbb{Z}$
  - d)  $-\infty$  and  $+\infty$
3. In a  $\Delta ABC$ , 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  $\Delta ABC$  are in A.P., then
  $(\tan \frac{A}{2} + \tan \frac{C}{2}) : \cot \frac{B}{2}$ , 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  $\tan \alpha + 2 \tan(2\alpha) + 4 \tan(4\alpha) + \dots + 2^{n-1} \tan(2^{n-1}\alpha) + 2^n \cot(2^n \alpha)$  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  $\Delta ABC$ , 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  $1 + \sin \theta + \sin^2 \theta + \dots \infty = 4 + 2\sqrt{3}$ ,  $0 < \theta < \pi$ ,  $\theta \neq \frac{\pi}{2}$ , 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  $\Delta ABC$ ,  
 $a(b^2 + c^2) \cos A + b(c^2 + a^2) \cos B + c(a^2 + b^2) \cos C$  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)  $\infty$
15. If, in a  $\Delta ABC$ ,  $(a + b + c)(b + c - a) = \lambda bc$ , then  
 a)  $\lambda < 0$       b)  $\lambda > 4$       c)  $\lambda > 0$       d)  $0 < \lambda < 4$
16. The expression  $\operatorname{cosec}^2 A \cot^2 A - \sec^2 A \tan^2 A - (\cot^2 A - \tan^2 A)(\sec^2 A \operatorname{cosec}^2 A - 1)$  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  $\sin^6 \theta + \cos^6 \theta = \frac{1}{4}[4 - 3(x^2 - 1)^2]$  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.

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