SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 1**

Topic :- TRIGONOMETRIC FUNCTIONS

1. The most general value of θ which satisfies both the equations $\tan\theta = -1$ and $\cos\theta = 1/\sqrt{2}$ will be
   a) $n\pi + \frac{7\pi}{4}$ b) $n\pi + (-1)^n \frac{7\pi}{4}$ c) $2n\pi + \frac{7\pi}{4}$ d) None of these
2. If $\sin x + \sin^2 x = 1$, then the value of $\cos^{12} x + 3\cos^{10} x + 3\cos^8 x + \cos^6 x - 1$ is equal to
   a) 2 b) 1 c) 0 d) -1
3. The side of a triangle are $3x + 4y, 4x + 3y$ and $5x + 5y$ units, where $x, y > 0$. The triangle is
   a) Right angled b) Equilateral c) Obtuse angled d) None of these
4. If the sides of a triangle are $x^2 + x + 1, x^2 - 1, 2x + 1$, where $x > 1$, then the largest angle is
   a) 120° b) 60° c) 40° d) 30°
5. If p_1, p_2, p_3 are altitudes of a triangle ABC from the vertices A, B, C and Δ, the area of the triangle, then $p_1^{-1} + p_2^{-1} - p_3^{-1}$ is equal to
   a) $\frac{s-a}{\Delta}$ b) $\frac{s-b}{\Delta}$ c) $\frac{s-c}{\Delta}$ d) $\frac{s}{\Delta}$
6. In a ΔABC if $a = 26, b = 30$ and $\cos C = \frac{63}{65}$, then $r_2 =$
   a) 84 b) 45 c) 48 d) 24
7. The value of $\cos 1° \cos 2° \cos 3° \ldots \cos 100°$ is equal to
   a) 1 b) -1 c) 0 d) None of these
8. The value of $\sin\frac{\pi}{2} + \sin\frac{2\pi}{7} + \sin\frac{3\pi}{7}$ is
   a) $\cot\frac{\pi}{14}$ b) $\frac{1}{2}\cot\frac{\pi}{14}$ c) $\tan\frac{\pi}{14}$ d) $\frac{1}{2}\tan\frac{\pi}{14}$
9. The value of x for the maximum value of $\sqrt{3}\cos x + \sin x$, is
   a) 30° b) 45° c) 60° d) 90°
10. $\sin^2 17.5° + \sin^2 72.5°$ is equal to
    a) $\cos^2 90°$ b) $\tan^2 45°$ c) $\cos^2 30°$ d) $\sin^2 45°$
11. If in ΔABC, $a\sin A = b\sin B$, then the triangle is
    a) Isosceles b) Right angled c) Equilateral d) None of these
12. $\sin^2\theta = \frac{4xy}{(x+y)^2}$ is true if and only if
    a) $x + y \neq 0$ b) $x = y, x \neq 0, y \neq 0$ c) $x = y$ d) $x \neq 0, y \neq 0$
13. If $\cos\theta = \frac{1}{2}\left(x + \frac{1}{x}\right)$, then $\frac{1}{2}\left(x^2 + \frac{1}{x^2}\right)$ is equal to
    a) $\sin 2\theta$ b) $\cos 2\theta$ c) $\tan 2\theta$ d) None of these
14. $\text{sech}^{-1}(\sin\theta)$ is equal to
    a) $\log\tan\frac{\theta}{2}$ b) $\log\sin\frac{\theta}{2}$ c) $\log\cos\frac{\theta}{2}$ d) $\log\cot\frac{\theta}{2}$
15. The number of solutions of the equation $2^{\cos x} = |\sin x|$ in $[-2\pi, 2\pi]$, is
    a) 1 b) 2 c) 3 d) 4

16. If the equation $\cos(\lambda \sin\theta) = \sin(\lambda \cos\theta)$ has a solution in $[0, 2\pi]$, then the smallest positive value of λ is

a) $\frac{\pi}{\sqrt{2}}$ b) $\sqrt{2}\,\pi$ c) $\frac{\pi}{2}$ d) $\frac{\pi}{2\sqrt{2}}$

17. In the ambiguous case, given a, b and A. The difference between the two values of C is

a) $2\sqrt{a^2 - b^2}$ b) $\sqrt{a^2 - b^2 \sin^2 A}$ c) $2\sqrt{a^2 - b^2 \sin^2 A}$ d) $\sqrt{a^2 - b^2}$

18. If $\tan\alpha = (1 + 2^{-x})^{-1}$, $\tan\beta = (1 + 2^{x+1})^{-1}$, then $\alpha + \beta$ equals

a) $\pi/6$ b) $\pi/4$ c) $\pi/3$ d) $\pi/2$

19. The maximum value of $f(x) = \sin x(1 + \cos x)$ is

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

20. The value of $\cos\frac{\pi}{11} + \cos\frac{3\pi}{11} + \cos\frac{5\pi}{11} + \cos\frac{7\pi}{11} + \cos\frac{9\pi}{11}$, is

a) 0 b) $\frac{-1}{2}$ c) $\frac{1}{2}$ d) 1

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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 $1 + \sin\theta + \sin^2\theta + \ldots \infty = 4 + 2\sqrt{3}, 0 < \theta < \pi, \theta \neq \frac{\pi}{2}$, 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 $\sin^6\theta + \cos^6\theta = \frac{1}{4}[4 - 3(x^2 - 1)^2]$ 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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DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 3**

Topic :- TRIGONOMETRIC FUNCTIONS

1. In a ΔABC, angles A, B, C are in A.P., then $\lim_{A\to C} \frac{\sqrt{3-4\sin A \sin C}}{|A-C|}$ is equal to
   a) 1 b) 2 c) 3 d) 4
2. For all values of θ, the values of $3 - \cos\theta + \cos\left(\theta + \frac{\pi}{3}\right)$ lie in the interval
   a) $[-2, 3]$ b) $[-2, 1]$ c) $[2, 4]$ d) $[1, 5]$
3. If $\cos A = m\cos B$ and $\cot\frac{A+B}{2} = \lambda\tan\frac{B-A}{2}$, then λ is
   a) $\frac{m}{m-1}$ b) $\frac{m+1}{m}$ c) $\frac{m+1}{m-1}$ d) None of these
4. The value of $\cos^4\left(\frac{\pi}{8}\right) + \cos^4\left(\frac{3\pi}{8}\right) + \cos^4\left(\frac{5\pi}{8}\right) + \cos^4\left(\frac{7\pi}{8}\right)$ is
   a) 0 b) $\frac{1}{2}$ c) $\frac{3}{2}$ d) 1
5. If $\sin\theta = \frac{12}{13}$, $\left(0 < \theta < \frac{\pi}{2}\right)$ and $\cos\phi = -\frac{3}{5}\left(\pi < \phi < \frac{3\pi}{2}\right)$, then $\sin(\theta + \phi)$ will be
   a) $-56/61$ b) $-56/65$ c) $1/65$ d) -56
6. The quadratic equation whose roots are $\sec^2\theta$ and $\text{cosec}^2\theta$ can be
   a) $x^2 - 2x + 2 = 0$ b) $x^2 + 5x + 5 = 0$ c) $x^2 - 4x + 4 = 0$ d) None of these
7. If $\sec\theta = m$ and $\tan\theta = n$, then $\frac{1}{m}\left[(m+n) + \frac{1}{(m+n)}\right]$ is
   a) 2 b) $2m$ c) $2n$ d) mn
8. If in a $\Delta ABC, \angle C = 90°$, then the maximum value of $\sin A \sin B$ is
   a) $\frac{1}{2}$ b) 1 c) 2 d) None of these
9. In a cyclic quadrilateral $ABCD$, he value of $\cos A + \cos B + \cos C + \cos D$, is
   a) 1 b) 0 c) -1 d) None of these
10. If the angles of a triangle are in the ratio $1 : 2 : 3$, the corresponding sides are in the ratio
    a) $2 : 3 : 1$ b) $\sqrt{3} : 2 : 1$ c) $2 : \sqrt{3} : 1$ d) $1 : \sqrt{3} : 2$
11. If $\sin(\pi\cos\theta) = \cos(\pi\sin\theta)$, then the value of $\cos\left(\theta + \frac{\pi}{4}\right)$ equals
    a) $\frac{1}{\sqrt{2}}$ b) $\frac{1}{2\sqrt{2}}$ c) $-\frac{1}{2\sqrt{2}}$ d) $-\frac{1}{\sqrt{2}}$
12. The most general solution of $2^{1+|\cos x|+\cos^2 x+|\cos^3 x|+\cdots\infty} = 4$ is given by
    a) $x = n\pi \pm \frac{\pi}{3}, n \in Z$
    b) $x = 2n\pi \pm \frac{\pi}{3}, n \in Z$
    c) $x = 2n\pi \pm \frac{2\pi}{3}, n \in Z$
    d) None of these
13. If $\cos\alpha + \cos\beta = 0 = \sin\alpha + \sin\beta$, then $\cos 2\alpha + \cos 2\beta =$

a) $-2\sin(\alpha+\beta)$ b) $-2\cos(\alpha+\beta)$ c) $2\sin(\alpha+\beta)$ d) $2\cos(\alpha+\beta)$

14. The value of the expression $1-\frac{\sin^2 y}{1+\cos y}+\frac{1+\cos y}{\sin y}-\frac{\sin y}{1-\cos y}$ is equal to

a) 0 b) 1 c) $\sin y$ d) $\cos y$

15. In a ΔABC, $a=2b$ and $A=3B$, the $A=$

a) $90°$ b) $60°$ c) $30°$ d) $45°$

16. If in a ΔABC, $A=\frac{\pi}{3}$ and AD is the median, then

a) $2\,AD^2=b^2+c^2+bc$

b) $4\,AD^2=b^2+c^2+bc$

c) $6\,AD^2=b^2+c^2+bc$

d) None of these

17. If $\cos(\theta-\alpha)=\alpha, \cos(\theta-\beta)=b$, then $\sin^2(\alpha-\beta)+2ab\cos(\alpha-\beta)$ is equal to

a) a^2+b^2 b) a^2-b^2 c) b^2-a^2 d) $-a^2-b^2$

18. If $\cos\frac{x}{2}.\cos\frac{x}{2^2}\ldots\ldots\cos\frac{x}{2^n}=\frac{\sin x}{2^n\sin\frac{x}{2^n}}$, then

$\frac{1}{2}\tan\frac{x}{2}+\frac{1}{2^2}\tan\frac{x}{2^2}+\ldots+\frac{1}{2^n}\tan\frac{x}{2^n}$ is

a) $\cot x-\cot\frac{x}{2^n}$ b) $\frac{1}{2^n}\cot\left(\frac{x}{2^n}\right)-\cot x$

c) $\frac{1}{2^n}\tan\left(\frac{1}{2^n}\right)-\tan x$ d) $\frac{1}{2}\cot x-\frac{1}{2^n}\cot\left(\frac{x}{2^n}\right)$

19. In triangles ABC and DEF, $AB=DE, AC=EF$ and $\angle A=2\angle E$. Two triangles will have the same area if angle A is equal to

a) $\pi/3$ b) $\pi/2$ c) $2\pi/3$ d) $5\pi/6$

20. The value of $\sin\left(\frac{\pi}{18}\right)\sin\left(\frac{5\pi}{18}\right)\sin\left(\frac{7\pi}{18}\right)$, is

a) 1/2 b) 1/4 c) 1/8 d) 1/16

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DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 4**

Topic :- TRIGONOMETRIC FUNCTIONS

1. If the equation $\sin^4\theta + \cos^4\theta = a$ has a real solution then
   a) $a \le \frac{1}{2}$ b) $a \ge \frac{1}{2}$ c) $\frac{1}{2} \le a \le 1$ d) $a \ge 0$
2. The general solution of the equation $(\sqrt{3}-1)\sin\theta + (\sqrt{3}+1)\cos\theta = 2$ is
   a) $2n\pi \pm \frac{\pi}{4} + \frac{\pi}{12}$
   b) $n\pi + (-1)^n \frac{\pi}{4} + \frac{\pi}{12}$
   c) $2n\pi \pm \frac{\pi}{4} - \frac{\pi}{12}$
   d) $n\pi + (-1)^n \frac{\pi}{4} - \frac{\pi}{12}$
3. If $\sin A = \frac{1}{\sqrt{10}}$ and $\sin B = \frac{1}{\sqrt{5}}$, where A and B are positive acute angles, then $A + B$ is equal to
   a) π b) $\frac{\pi}{2}$ c) $\frac{\pi}{3}$ d) $\frac{\pi}{4}$
4. The general solution of $\sin^2\theta \sec\theta + \sqrt{3}\tan\theta = 0$ is
   a) $\theta = n\pi + (-1)^{n+1}\frac{\pi}{3}, \theta = n\pi, n \in I$ b) $\theta = n\pi, n \in I$
   c) $\theta = n\pi + (-1)^{n+1}\frac{\pi}{3}, n \in I$ d) $\theta = \frac{n\pi}{2}, n \in I$
5. If $y + \cos\theta = \sin\theta$ has a real solution, then
   a) $-\sqrt{2} \le y \le \sqrt{2}$ b) $y > \sqrt{2}$ c) $y \le -\sqrt{2}$ d) None of these
6. If $\cos(\theta - \alpha) = a, \sin(\theta - \beta) = b$, then $\cos^2(\alpha - \beta) + 2ab\sin(\alpha - \beta)$ is equal to
   a) $4a^2b^2$ b) $a^2 - b^2$ c) $a^2 + b^2$ d) $-a^2b^2$
7. The equation $8\sec^2\theta - 6\sec\theta + 1 = 0$ has
   a) Exactly two roots b) Exactly four roots c) Infinitely many roots d) No roots
8. If the sides a, b, c of a triangle ABC are the roots of the equation $x^3 - 13x^2 + 54x - 72 = 0$, then the value of $\frac{\cos A}{a} + \frac{\cos B}{b} + \frac{\cos C}{c}$ is equal to
   a) $\frac{169}{144}$ b) $\frac{61}{72}$ c) $\frac{61}{144}$ d) $\frac{169}{72}$
9. $\cos^4\theta - \sin^4\theta$ is equal to
   a) $1 + 2\sin^2\left(\frac{\theta}{2}\right)$ b) $2\cos^2\theta - 1$ c) $1 - 2\sin^2\left(\frac{\theta}{2}\right)$ d) $1 + 2\cos^2\theta$
10. The value of $\cos 15° \cos 7\frac{1}{2}° \sin 7\frac{1}{2}°$ is
    a) $\frac{1}{2}$ b) $\frac{1}{8}$ c) $\frac{1}{4}$ d) $\frac{1}{16}$
11. If θ lies in the second quadrant, then the value of $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} + \sqrt{\frac{1+\sin\theta}{1-\sin\theta}}$ is equal to
    a) $2\sec\theta$ b) $-2\sec\theta$ c) $2\,\mathrm{cosec}\,\theta$ d) None of these
12. The value of $\cos^2 A\,(3 - 4\cos^2 A)^2 + \sin^2 A\,(3 - 4\sin^2 A)^2$ is equal to
    a) $\cos 4A$ b) $\sin 4A$ c) 1 d) None of these

13. Let the angles A, B, C of ΔABC be in A.P. and let
a) $75°$ b) $45°$ c) $60°$ d) $15°$

14. If $\tan x = \frac{b}{a}$, then $\sqrt{\frac{a+b}{a-b}} + \sqrt{\frac{a-b}{a+b}} =$
a) $\frac{2\sin x}{\sqrt{\sin 2x}}$ b) $\frac{2\cos x}{\sqrt{\cos 2x}}$ c) $\frac{2\cos x}{\sqrt{\sin 2x}}$ d) $\frac{2\sin x}{\sqrt{\cos 2x}}$

15. If $\sin A + \cos A = m$ and $\sin^3 A + \cos^3 A = n$, then
a) $m^3 - 3m + n = 0$ b) $n^3 - 3n + 2m = 0$ c) $m^3 - 3m + 2n = 0$ d) $m^3 + 3m + 2n = 0$

16. The most general solutions of the equation $\sec x - 1 = \left(\sqrt{2} - 1\right)\tan x$ are given by
a) $n\pi + \frac{\pi}{8}$ b) $2n\pi, 2n\pi + \frac{\pi}{4}$ c) $2n\pi$ d) None of these

17. If $\cos(\theta - \alpha) = a$, $\cos(\theta - \beta) = b$, then $\sin^2(\alpha - \beta) + 2ab\cos(\alpha - \beta)$ is equal to
a) $a^2 + b^2$ b) $a^2 - b^2$ c) $b^2 - a^2$ d) $-a^2 - b^2$

18. The sum $S = \sin\theta + \sin 2\theta + \ldots + \sin n\theta$ equals
a) $\sin\frac{1}{2}(n+1)\theta \sin\frac{n\theta}{2} / \sin\frac{\theta}{2}$ b) $\cos\frac{1}{2}(n+1)\theta \sin\frac{n\theta}{2} / \sin\frac{\theta}{2}$
c) $\sin\frac{1}{2}(n+1)\theta \cos\frac{n\theta}{2} / \sin\frac{\theta}{2}$ d) $\cos\frac{1}{2}(n+1)\theta \cos\frac{n\theta}{2} / \sin\frac{\theta}{2}$

19. The sides of an equilateral triangle, a square and a regular hexagon circumscribed in a circle are in
a) A.P. b) G.P. c) H.P. d) None of these

20. If $\frac{\tan 3\theta - 1}{\tan 3\theta + 1} = \sqrt{3}$, then the general value of θ is
a) $\frac{n\pi}{3} - \frac{\pi}{12}$ b) $n\pi + \frac{7\pi}{12}$ c) $\frac{n\pi}{3} + \frac{7\pi}{36}$ d) $n\pi + \frac{\pi}{12}$

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DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 5**

Topic :- TRIGONOMETRIC FUNCTIONS

1. If $\theta \in [0,5\pi]$ and $r \in R$ such that $2\sin\theta = r^4 - 2r^2 + 3$, then the maximum number of values of the pair (r, θ) is
   a) 6 b) 8 c) 10 d) None of these
2. In a triangle ABC, $r =$
   a) $(s-a)\tan\frac{B}{2}$ b) $(s-b)\tan\frac{B}{2}$ c) $(s-b)\tan\frac{C}{2}$ d) $(s-a)\tan\frac{C}{2}$
3. If p_1, p_2, p_3 are altitude of a triangle ABC from the vertices A, B, C and Δ, the area of the triangle, then $\frac{1}{p_1^2}+\frac{1}{p_2^2}+\frac{1}{p_3^2} =$
   a) $\frac{\cot A+\cos B+\cot C}{\frac{\Delta}{\Delta}}$
   b) $\frac{\Delta}{\cot A+\cot B+\cot C}$
   c) $\Delta(\cot A + \cot B + \cot C)$
   d) None of these
4. Number of solutions of the equation $\sin 2\theta + 2 = 4\sin\theta + \cos\theta$ lying in the interval $[\pi, 5\pi]$, is
   a) 0 b) 2 c) 4 d) 5
5. If twice the square of the diameter of a circle is equal to half the sum of the squares of the sides of incribed triangle ABC, then $\sin^2 A + \sin^2 C$ is equal to
   a) 1 b) 2 c) 4 d) 8
6. $\tan 9° - \tan 27° - \tan 63° + \tan 81°$ is equal to
   a) 0 b) 1 c) -1 d) 4
7. If $\sin 4A - \cos 2A = \cos 4A - \sin 2A, \left(0 < A < \frac{\pi}{4}\right)$, then the value of $\tan 4A$ is
   a) 1 b) $\frac{1}{\sqrt{3}}$ c) $\sqrt{3}$ d) $\frac{\sqrt{3}-1}{\sqrt{3}+1}$
8. In a ΔABC, $\sin A$ and $\sin B$ are the roots of the equation $c^2x^2 - c(a+b)x + ab = 0$, then $\sin C =$
   a) $1/\sqrt{2}$ b) $1/2$ c) 1 d) 0
9. If $\sin(\alpha+\beta) = 1, \sin(\alpha-\beta) = 1/2;\ \alpha, \beta \in [0, \pi/2]$, then $\tan(\alpha+2\beta)\tan(2\alpha+\beta)$ is equal to
   a) 1 b) -1 c) 0 d) $1/2$
10. If $a_{n+1} = \sqrt{\frac{1}{2}(1+a_n)}$, then $\cos\left(\frac{\sqrt{1-a_0^2}}{a_1 a_2 a_3 \ldots \text{to } \infty}\right) =$
    a) 1 b) -1 c) a_0 d) $1/a_0$
11. If the angles of a triangle are in the ratio $1:2:7$, then the ratio of the greatest side to the least side is
    a) $(\sqrt{5}-1):(\sqrt{5}+1)$ b) $(\sqrt{5}+1):(\sqrt{5}-1)$ c) $(\sqrt{5}+2):(\sqrt{5}-2)$ d) $(\sqrt{5}-2):(\sqrt{5}+2)$

12. In a $\Delta ABC, A = \frac{2\pi}{3}, b - c = 3\sqrt{3}$ cm and $\Delta = \frac{9\sqrt{3}}{2}$ cm^2. Then, $a =$

a) $6\sqrt{3}$ cm b) 9 cm c) 18 cm d) 12 cm

13. If the radius of the incircle of a triangle with its sides $5k, 6k$, and $5k$ is 6, then k is equal to

a) 3 b) 4 c) 5 d) 6

14. The minimum value of $2^{\sin x} + 2^{\cos x}$, is

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

15. Minimum value of $\frac{1}{3\sin\theta - 4\cos\theta + 7}$ is

a) $\frac{1}{12}$ b) $\frac{5}{12}$ c) $\frac{7}{12}$ d) $\frac{1}{6}$

16. If $\operatorname{cosec}\theta = \frac{p+q}{p-q}$, then $\cot(\pi/4 + \theta/2) =$

a) $\sqrt{\frac{p}{q}}$ b) $\sqrt{\frac{q}{p}}$ c) $\sqrt{pq}$ d) pq

17. Suppose $0 < t < \pi$ and$\sin t + \cos t = \frac{1}{5}$. Then, $\tan\frac{t}{2}$ is equal to

a) 2 b) 3 c) $\frac{1}{3}$ d) 5

18. For what and only what values of α lying between 0 and π is the inequality $\sin\alpha\cos^3\alpha > \sin^3\alpha\cos\alpha$ valid?

a) $\alpha \in (0, \pi/4)$ b) $\alpha \in (0, \pi/2)$ c) $\alpha \in (\pi/4, \pi/2)$ d) None of these

19. If $\alpha + \beta - \gamma = \pi$, then $\sin^2\alpha + \sin^2\beta - \sin^2\gamma$ is equal to

a) $2\sin\alpha\sin\beta\cos\gamma$ b) $2\cos\alpha\cos\beta\cos\gamma$ c) $2\sin\alpha\sin\beta\sin\gamma$ d) None of these

20. If $\sec x \cos 5x + 1 = 0$, where $0 < x < 2\pi$, then x is equal to

a) $\frac{\pi}{5}, \frac{\pi}{4}$ b) $\frac{\pi}{5}$ c) $\frac{\pi}{4}$ d) None of these

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 6**

Topic :- TRIGONOMETRIC FUNCTIONS

1. If $\alpha, \beta \in \left(0, \frac{\pi}{2}\right)$, $\sin\alpha = \frac{4}{5}$ and $\cos(\alpha+\beta) = -\frac{12}{13}$, then $\sin\beta$ is equal to
   a) $\frac{63}{65}$ b) $\frac{61}{65}$ c) $\frac{3}{5}$ d) $\frac{5}{13}$
2. The value of $\sin\frac{\pi}{14}\sin\frac{3\pi}{14}\sin\frac{5\pi}{14}\sin\frac{7\pi}{14}$, is
   a) 1 b) $1/4$ c) $1/8$ d) $\sqrt{2}/7$
3. If $\theta_1, \theta_2, \theta_3, \theta_4$ are roots of the equation $\sin(\theta+\alpha) = k\sin 2\,\theta$ no two of which differ by a multiple of $2\,\pi$, then $\theta_1+\theta_2+\theta_3+\theta_4$ is equal to
   a) $2n\,\pi, n \in Z$ b) $(2n+1)\pi, n \in Z$ c) $n\,\pi, n \in Z$ d) None of these
4. The radius of the circle whose arc of length 15π cm makes an angle of $\frac{3\pi}{4}$ radian at the centre is
   a) 10 cm b) 20 cm c) $11\frac{1}{4}$ cm d) $22\frac{1}{2}$ cm
5. The value of $\cot\theta - \tan\theta - 2\tan 2\theta - 4\tan 4\theta - 8\cot 8\theta$, is
   a) 0 b) 1 c) -1 d) None of these
6. In a triangle ABC, $b = \sqrt{3}, c = 1$ and $\angle A = 30°$, then the measure of the largest angle of the triangle is
   a) 60° b) 135° c) 90° d) 120°
7. The maximum value of $3\cos\theta + 4\sin\theta$ is
   a) 3 b) 4 c) 5 d) None of these
8. If the sides of a triangle are proportional to 2, $\sqrt{6}$ and $\sqrt{3}-1$, the greatest and the least angles of the triangle are
   a) 120°, 15° b) 90°, 15° c) 75°, 45° d) 150°, 15°
9. In a ΔABC if $r_1 = 16, r_2 = 48$ *and* $r_3 = 24$, then its in-radius is
   a) 7 b) 8 c) 6 d) None of these
10. The number of values of x in the interval $[0, 5\pi]$ satisfying the equation $3\sin^2 x - 7\sin x + 2 = 0$ is
    a) 0 b) 5 c) 6 d) 10
11. If $\cos^2\theta = \cos 2\theta$, then the general value of θ is
    a) $n\pi$ b) $2n\pi$ c) $\frac{n\pi}{3}$ d) $\frac{n\pi}{2}$
12. The equation $3^{\sin 2x + 2\cos^2 x} + 3^{1-\sin 2x + 2\sin^2 x} = 28$ is satisfied for the values of x given by
    a) $\cos x = 0, \tan x = -1$ b) $\tan x = -1, \cos x = 1$ c) $\tan x = 1, \cos x = 0$
    d) None of these
13. The minimum value of $27^{\cos 2x}\,81^{\sin 2x}$ is
    a) -5 b) $\frac{1}{5}$ c) $\frac{1}{243}$ d) $\frac{1}{27}$
14. Let $0 < x \le \pi/4$, then $(\sec 2x - \tan 2x)$ equals
    a) $\tan^2(x+\pi/4)$ b) $\tan(x+\pi/4)$ c) $\tan(\pi/4-x)$ d) $\tan(x-\pi/4)$

15. The number of solutions of the equation $\sin^5 x - \cos^5 x = \frac{1}{\cos x} - \frac{1}{\sin x}\,(\sin x \neq \cos x)$ is

a) 0 b) 1 c) Infinite d) None of these

16. Let $\cos(\alpha + \beta) = \frac{4}{5}$ and let $\sin(\alpha - \beta) = \frac{5}{13}$, where $0 \leq \alpha, \beta \leq \frac{\pi}{4}$. Then $\tan 2\alpha$ is equal to

a) $\frac{25}{16}$ b) $\frac{56}{33}$ c) $\frac{19}{12}$ d) $\frac{20}{7}$

17. The value of $\cos\frac{2\pi}{7} + \cos\frac{4\pi}{7} + \cos\frac{6\pi}{7}$, is

a) 1 b) -1 c) $1/2$ d) $-1/2$

18. If in a triangle $a\cos^2\left(\frac{C}{2}\right) + c\cos^2\left(\frac{A}{2}\right) = \frac{3b}{2}$, then the sides of the triangle are in

a) AP b) GP c) HP d) None of these

19. If $\frac{1-\cos 2\theta}{1+\cos 2\theta} = 3$, then the general value of θ is

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

20. In a ΔABC, if $a = 5$ cm, $b = 4$ cm and $\cos(A - B) = \frac{31}{32}$, then $\cos C =$

a) $1/4$ b) $1/8$ c) $1/6$ d) $1/2$

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 7**

Topic :- TRIGONOMETRIC FUNCTIONS

1. The number of solutions for the equation $\sin 2x + \cos 4x = 2$ is
   a) 0 b) 1 c) 2 d) ∞
2. If $\sin\theta_1 + \sin\theta_2 + \sin\theta_3 = 3$, then $\cos\theta_1 + \cos\theta_2 + \cos\theta_3 =$
   a) 3 b) 2 c) 1 d) 0
3. The equation $k \sin x + \cos 2x = 2k - 7$ possesses solution, if
   a) $k > 6$ b) $2 \le k \le 6$ c) $k > 2$ d) None of these
4. If $\cos 2B = \frac{\cos(A+C)}{\cos(A-C)}$, then $\tan A$, $\tan B$, $\tan C$ are in
   a) AP b) GP c) HP d) None of these
5. If n is an odd positive integer, then $\left(\frac{\cos A+\cos B}{\sin A-\sin B}\right)^n + \left(\frac{\sin A+\sin B}{\cos A-\cos B}\right)^n =$
   a) -1 b) 1 c) 0 d) None of these
6. If α, β are the solutions of $a\tan\theta + b\sec\theta = c$, then $\tan(\alpha+\beta) =$
   a) $\frac{2ac}{a^2-c^2}$ b) $\frac{2ac}{c^2-a^2}$ c) $\frac{2ac}{a^2+c^2}$ d) $\frac{ac}{a^2+c^2}$
7. If $\tan\theta + \tan\left(\theta+\frac{\pi}{3}\right) + \tan\left(\theta+\frac{2\pi}{3}\right) = 3$, then which of the following is equal to 1?
   a) $\tan 2\theta$ b) $\tan 3\theta$ c) $\tan^2\theta$ d) $\tan^3\theta$
8. If $y = 1 + 4\sin^2 x \cos^2 x$, then
   a) $1 \le y \le 2$ b) $-1 \le y \le 1$ c) $-3 \le y \le 3$ d) None of these
9. If $\alpha + \beta - \gamma = \pi$, then $\sin^2\alpha + \sin^2\beta - \sin^2\gamma$ is equal to
   a) $2\sin\alpha\sin\beta\cos\gamma$ b) $2\cos\alpha\cos\beta\cos\gamma$ c) $2\sin\alpha\sin\beta\sin\gamma$ d) None of the above
10. In a ΔABC, $\frac{\cot\frac{A}{2}+\cot\frac{B}{2}+\cot\frac{C}{2}}{\cot A+\cot B+\cot C} =$
    a) $\frac{(a+b+c)^2}{a^2+b^2+c^2}$ b) $\frac{a^2+b^2+c^2}{(a+b+c)^2}$ c) s d) Δ
11. The expression $\tan^2\alpha + \cot^2\alpha$ is
    a) ≥ 2 b) ≤ 2 c) ≥ -2 d) None of these
12. For $m \ne n$, if $\tan m\theta = \tan n\theta$, the different values of θ are in
    a) A.P.
    b) H.P.
    c) G.P.
    d) No particular sequence
13. If in a triangle ABC,
$\sin A : \sin C = \sin(A-B) : \sin(B-C)$ *then*, $a^2 : b^2 : c^2$ *are in*
    a) A.P. b) G.P. c) H.P. d) None of these

14. If $\tan\theta = x - \frac{1}{4x}$, then $\sec\theta - \tan\theta$ is equal to

a) $-2x, \frac{1}{2x}$ b) $-\frac{1}{2x}, 2x$ c) $2x$ d) $2x, \frac{1}{2x}$

15. The number of values of $x \in [0, 2\pi]$ that satisfy $\cot x - \operatorname{cosec} x = 2\sin x$, is

a) 3 b) 2 c) 1 d) 0

16. If R is the radius of circumscribing circle of a regular polygon of n-sides, then $R =$

a) $\frac{a}{2}\sin\left(\frac{\pi}{n}\right)$ b) $\frac{a}{2}\cos\left(\frac{\pi}{n}\right)$ c) $\frac{a}{2}\operatorname{cosec}\left(\frac{\pi}{n}\right)$ d) $\frac{a}{2}\operatorname{cosec}\left(\frac{\pi}{2n}\right)$

17. If $\frac{\sin x}{\sin y} = \frac{1}{2}, \frac{\cos x}{\cos y} = \frac{3}{2}$, where $x, y \in \left(0, \frac{\pi}{2}\right)$, then the value of $\tan(x + y)$ is equal to

a) $\sqrt{13}$ b) $\sqrt{14}$ c) $\sqrt{17}$ d) $\sqrt{15}$

18. If $\sin A + \sin B = \sqrt{3}(\cos B \cos A)$, then $\sin 3A + \sin 3B =$

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

19. If $\tan\beta = \cot\theta \tan\alpha$, then $\cot^2\left(\frac{\theta}{2}\right)$ is equal to

a) $\frac{\sin(\alpha+\beta)}{\sin(\alpha-\beta)}$ b) $\frac{\sin(\alpha-\beta)}{\sin(\alpha+\beta)}$ c) $\frac{\cos(\alpha+\beta)}{\cos(\alpha-\beta)}$ d) $\frac{\cos(\alpha-\beta)}{\cos(\alpha+\beta)}$

20. $\frac{\cos 9° + \sin 9°}{\cos 9° - \sin 9°}$ is equals to

a) $\tan 26°$ b) $\tan 81°$ c) $\tan 51°$ d) $\tan 54°$

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 8**

Topic :- TRIGONOMETRIC FUNCTIONS

1. In a ΔABC, if $A = 45°, b = \sqrt{6}, a = 2$, then $B =$
   a) 30° or 150° b) 60° or 120° c) 45° or 135° d) None of these
2. Two sides of a triangle are $2\sqrt{2}$ cm and $2\sqrt{3}$ cm and the angle opposite to the shorter side of the two is $\frac{\pi}{4}$. The largest possible length of the third side is
   a) $(\sqrt{6}+\sqrt{2})$ cm b) $(6+\sqrt{2})$ cm c) $(\sqrt{6}-\sqrt{2})$ cm d) None of these
3. The total number of ordered pairs (r, θ) satisfying $r\sin\theta = 3, r = 4(1+\sin\theta)$, where $r > 0$ and $\theta \in [-\pi, \pi]$ is
   a) 0 b) 2 c) 4 d) None of these
4. $\sin 65° + \sin 43° - \sin 29° - \sin 7°$ is equal to
   a) $\cos 36°$ b) $\cos 18°$ c) $\cos 9°$ d) None of these
5. If $\sin B = \frac{1}{5}\sin(2A+B)$, then $\frac{\tan(A+B)}{\tan A}$ is equal to
   a) 5/3 b) 2/3 c) 3/2 d) 3/5
6. If $A + B + C = \pi$ and $\cos A = \cos B \cos C$, then $\tan B \tan C$ is equal to
   a) $\frac{1}{2}$ b) 2 c) 1 d) $-\frac{1}{2}$
7. If $\sin x + \text{cosec}\, x = 2$ then, $\sin^n x + \text{cosec}^n x$ is equal to
   a) 2 b) 2^n c) 2^{n-1} d) 2^{n-2}
8. If in a triangle ABC, $\frac{a^2-b^2}{a^2+b^2} = \frac{\sin(A-B)}{\sin(A+B)}$, then the triangle is
   a) Right angled or isosceles
   b) Right angled and isosceles
   c) Equilateral
   d) None of these
9. In a ΔABC, $\cos A = \cos B \cos C$, then $\cot B \cot C$ is equal to
   a) 2 b) 3 c) 1/2 d) 5
10. In a ΔABC if $a = 13, b = 14$ and $c = 15$, then reciprocals of r_1, r_2 and r_3 are in the ratio
    a) 6 : 7 : 8 b) 6 : 8 : 7 c) 8 : 7 : 6 d) None of these
11. $\frac{\sin 7\theta + 6\sin 5\theta + 17\sin 3\theta + 12\sin\theta}{\sin 6\theta + 5\sin 4\theta + 12\sin 2\theta}$ is equal to
    a) $2\cos\theta$ b) $\cos\theta$ c) $2\sin\theta$ d) $\sin\theta$
12. In a triangle the angles are in A.P. and the lengths of the two larger sides are 10 and 9 respectively, then the length of the third side can be
    a) $5 \pm \sqrt{6}$ b) 0.7 c) $\sqrt{5} + 6$ d) None of these
13. The general value of x for which $\cos 2x, \frac{1}{2}$ and $\sin 2x$ are in AP, are given by

a) $n\pi, n\pi + \frac{\pi}{2}$ b) $n\pi, n\pi + \frac{\pi}{4}$ c) $n\pi + \frac{\pi}{4}, \frac{3n\pi}{4}$ d) None of these

14. If $a = \frac{\pi}{18}$ rad, then $\cos a + \cos 2a + \ldots + \cos 18a$ is equal to

a) 0 b) -1 c) 1 d) ± 1

15. If $\sin\theta + \cos\theta = 1$, then the general value of θ is

a) $2n\pi$ b) $n\pi + (-1)^n \frac{\pi}{4} - \frac{\pi}{4}$ c) $2n\pi + \frac{\pi}{2}$ d) None of these

16. If $1 + \sin x + \sin^2 x + \sin^3 x + \cdots + \cdots \infty$ is equal to $4 + 2\sqrt{3}, 0 < x < \pi$, then $x =$

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

17. If $\sin x + \sin y = a$ and $\cos x + \cos y = b$, then $\tan\left(\frac{a+y}{2}\right)$ is equal to

a) $\frac{ab}{a+b}$ b) $\frac{a}{b}$ c) $\frac{b}{a}$ d) None of these

18. If $\sin(\pi \cot\theta) = \cos(\pi \tan\theta)$, then $\cot 2\,\theta$ is equal to where $n \in Z$

a) $n - \frac{1}{4}$ b) $n + \frac{1}{4}$ c) $4n + 1$ d) $4n - 1$

19. If the altitudes of a triangle are in AP, then the sides of the triangle are in

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

20. The value of $\cos\frac{\pi}{5}\cos\frac{2\pi}{5}\cos\frac{4\pi}{5}\cos\frac{8\pi}{5}$ is equal to

a) $\frac{1}{16}$ b) 0 c) $-\frac{1}{8}$ d) $-\frac{1}{16}$

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 9**

Topic :- TRIGONOMETRIC FUNCTIONS

1. $cosec\ 15° + \sec 15°$ is equal to
   a) $2\sqrt{2}$ b) $\sqrt{6}$ c) $2\sqrt{6}$ d) $\sqrt{6} + \sqrt{2}$
2. If $\sin A = \frac{4}{5}$ and $\cos B = -\frac{12}{13}$, where A and B lie in first and third quadrant respectively, then $\cos(A + B)$ is equal to
   a) $\frac{56}{65}$ b) $-\frac{56}{65}$ c) $\frac{16}{65}$ d) $-\frac{16}{65}$
3. If $\cot\theta + \tan\theta = m$ and $\sec\theta - \cos\theta = n$, then which of the following is correct?
   a) $m(mn^2)^{1/3} - n(nm^2)^{1/3} = 1$ b) $m(m^2n)^{1/3} - n(mn^2)^{1/3} = 1$
   c) $n(mn^2)^{1/3} - m(nm^2)^{1/3} = 1$ d) $n(m^2n)^{1/3} - m(mn^2)^{1/3} = 1$
4. If in a $\Delta\ ABC$,
   $(\sin A + \sin B + \sin C)(\sin A + \sin B - \sin C) = 3\sin A \sin B$, then
   a) $A = 60°$ b) $B = 60°$ c) $C = 60°$ d) None of these
5. Equation $\cos 2x + 7 = a(2 - \sin x)$ can have a real solution for
   a) All values of a b) $a \in [2, 6]$ c) $a \in (-\infty, 2)$ d) $a \in (0, \infty)$
6. In a $\Delta\ ABC, \angle A = \frac{\pi}{2}$, then $\cos^2 B + \cos^2 C$ equals
   a) -2 b) -1 c) 1 d) 0
7. In any $\Delta\ ABC, b^2 \sin 2C + c^2 \sin 2B$
   a) Δ b) $2\ \Delta$ c) $3\ \Delta$ d) $4\ \Delta$
8. In a triangle the length of the two larger sides are 24 and 22, respectively. If the angles are in AP, then the third side is
   a) $12 + 2\sqrt{13}$ b) $12 - 2\sqrt{13}$ c) $2\sqrt{13} + 2$ d) $2\sqrt{13} - 2$
9. If in a ΔABC, AD, BE and CF are the altitudes and R is the circum-radius, then radius of the circumcircle DEF is
   a) $\frac{R}{2}$ b) $2R$ c) R d) $\frac{3}{2}R$
10. If a, b, c denote the sides of a ΔABC and the equations $ax^2 + bx + c = 0$ and $x^2 + \sqrt{2}x + 1 = 0$ have a common root, then $\angle C =$
    a) $30°$ b) $45°$ c) $90°$ d) $60°$
11. If a circle is inscribed in an equilateral triangle of side a, then area of the square inscribed in the circle is
    a) $\frac{a^2}{6}$ b) $\frac{a^2}{3}$ c) $\frac{2a^2}{5}$ d) $\frac{2a^2}{3}$
12. The value of the expression $\cos 1°.\cos 2° \ldots\ldots \cos 179°$ equals
    a) 0 b) 1 c) $1/\sqrt{2}$ d) -1
13. The general solution of the equation $2^{\cos 2x} + 1 = 3.2^{-\sin x}$ is
    a) $n\pi$ b) $n\pi - \pi$ c) $n\pi + \pi$ d) None of these

14. If $\sin A - \sqrt{6}\cos A = \sqrt{7}\cos A$, then $\cos A + \sqrt{6}\sin A$ is equal to

a) $\sqrt{6}\sin A$ b) $-\sqrt{7}\sin A$ c) $\sqrt{6}\cos A$ d) $\sqrt{7}\cos A$

15. If $y = \frac{\tan x}{\tan 3x}$, then

a) $y \in [1/3, 3]$ b) $y \notin [1/3, 3]$ c) $y \in [-3, -1/3]$ d) $y \notin [-3, -1/3]$

16. If $\frac{3\pi}{4} < \alpha < \pi$, then $\sqrt{\text{cosec}^2\alpha + 2\cot\alpha}$ is equal to

a) $1 + \cot\alpha$ b) $1 - \cot\alpha$ c) $-1 - \cot\alpha$ d) $-1 + \cot\alpha$

17. The equation $a\sin x + b\cos x = c$, where $|c| > \sqrt{a^2 + b^2}$ has

a) A unique solution

b) Infinite no. of solutions

c) No solution

d) None of these

18. The number of solutions of the equation $\tan\theta + \sec\theta = 2\cos\theta$ lying in the interval $[0, 2\pi]$, is

a) 0 b) 1 c) 2 d) 3

19. The least positive non-integral solution of $\sin\pi(x^2 + x) - \sin\pi x^2 = 0$, is

a) Rational

b) Irrational of the form $\sqrt{p}$

c) Irrational of the form $\frac{\sqrt{p}-1}{4}$, when p is an odd integer

d) Irrational of the form $\frac{\sqrt{p}+1}{4}$, where p is an even integer

20. If A and B are acute positive angles satisfying the equations $3\sin^2 A + 2\sin^2 B = 1$ and $3\sin 2A - 2\sin 2B = 0$, then $A + 2B$ is equal to

a) 0 b) $\frac{\pi}{2}$ c) $\frac{\pi}{4}$ d) $\frac{\pi}{3}$

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 10**

Topic :- TRIGONOMETRIC FUNCTIONS

1. The greatest and least value of $\sin x \cos x$ are respectively
   a) $1, -1$ b) $\frac{1}{2}, -\frac{1}{2}$ c) $\frac{1}{4}, -\frac{1}{4}$ d) $2, -2$
2. If $x = X\cos\theta - Y\sin\theta, y = X\sin\theta + Y\cos\theta$ and $x^2 + 4xy + y^2 = AX^2 + BY^2, 0 \le \theta \le \frac{\pi}{2}, n \in Z$, then
   a) $\theta = \frac{\pi}{6}, A = 3, B = 1$ b) $\theta = \frac{\pi}{2}, A = 3, B = 1$ c) $A = 3, B = -1, \theta = \frac{\pi}{4}$ d) $A = -3, B = 1, \theta = \frac{\pi}{4}$
3. The number of values of x in $[0, 2\pi]$ satisfying the equation $3\cos 2x - 10\cos x + 7 = 0$ is
   a) 1 b) 2 c) 3 d) 4
4. $\cos\alpha\sin(\beta - \gamma) + \cos\beta\sin(\gamma - \alpha) + \cos\gamma\sin(\alpha - \beta)$ is equal to
   a) 0 b) $\frac{1}{2}$ c) 1 d) $4\cos\alpha\cos\beta\cos\gamma$
5. If $A + B = 45°$, then $(\cot A - 1)(\cot B - 1)$ is equal to
   a) 1 b) $\frac{1}{2}$ c) -1 d) 2
6. The solution of the equation $[\sin x + \cos x]^{1+\sin 2x} = 2, -\pi \le x \le \pi$ is
   a) $\frac{\pi}{2}$ b) π c) $\frac{\pi}{4}$ d) $\frac{3\pi}{4}$
7. If $\sin x + \sin^2 x = 1$, then the value of $\cos^{12} x + 3\cos^{10} x + 3\cos^8 x + \cos^6 x + 2\cos^4 x + \cos^2 x - 2$, is equal to
   a) 0 b) 1 c) 2 d) $\sin^2 x$
8. $\sin^4\frac{\pi}{8} + \sin^4\frac{3\pi}{8} + \sin^4\frac{5\pi}{8} + \sin^4\frac{7\pi}{8}$ is equal to
   a) 1 b) 3/2 c) 2 d) 1 /4
9. If $\sin(x + 3\alpha) = 3\sin(\alpha - x)$, then
   a) $\tan x = \tan\alpha$ b) $\tan x = \tan^2\alpha$ c) $\tan x = \tan^3\alpha$ d) $\tan x = 3\tan\alpha$
10. $\cos\alpha\sin(\beta - \gamma) + \cos\beta\sin(\gamma - \beta) + \cos\gamma\sin(\alpha - \beta) =$
    a) 0 b) 1/2 c) 1 d) $4\cos\alpha\cos\beta\cos\gamma$
11. If $\sin A + \cos A = m$ and $\sin^3 A + \cos^3 A = n$, then
    a) $m^3 - 3m + n = 0$ b) $n^3 - 3n + 2m = 0$ c) $m^3 - 3m + 2n = 0$ d) $m^3 + 3m + 2n = 0$
12. If $(\sec\theta - 1) = (\sqrt{2} - 1)\tan\theta$, then $\theta =$
    a) $n\pi + \frac{\pi}{8}, n \in Z$
    b) $2n\pi, 2n\pi + \frac{\pi}{4}, n \in Z$
    c) $2n\pi, n \in Z$
    d) None of these
13. The number of values of θ in the interval $[-\pi, \pi]$ satisfying the equation $\cos\theta + \sin 2\theta = 0$ is
    a) 1 b) 2 c) 3 d) 4

14. The general solution of $\tan\left(\frac{\pi}{2}\sin\theta\right) = \cot\left(\frac{\pi}{2}\cos\theta\right)$ is

a) $\theta = 2r\,\pi + \frac{\pi}{2}, r \in Z$

b) $\theta = 2r\,\pi, r \in Z$

c) $\theta = 2r\,\pi + \frac{\pi}{2}$ and $\theta = 2r\,\pi, r \in Z$

d) None of these

15. The most general values of θ satisfying $\tan\theta + \tan\left(\frac{3\pi}{4} + \theta\right) = 2$ are given by

a) $2n\pi \pm \frac{\pi}{3}, n \in Z$ b) $n\pi + \frac{\pi}{3}, n \in Z$ c) $2n\pi \pm \frac{\pi}{6}, n \in Z$ d) $n\pi \pm \frac{\pi}{6}, n \in Z$

16. If $(1 + \tan\theta)(1 + \tan\phi) = 2$, then $\theta + \phi =$

a) $30°$ b) $45°$ c) $60°$ d) $75°$

17. If α and β satisfying $2\sec 2\alpha = \tan\beta + \cot\beta$, then $\alpha + \beta$ is equal to

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

18. If $0 < \theta < 2\pi$, then the intervals of values of θ for which $2\sin^2\theta - 5\sin\theta + 2 > 0$, is

a) $\left(0, \frac{\pi}{6}\right) \cup \left(\frac{5\pi}{6}, 2\pi\right)$ b) $\left(\frac{\pi}{8}, \frac{5\pi}{6}\right)$ c) $\left(0, \frac{\pi}{8}\right) \cup \left(\frac{\pi}{6}, \frac{5\pi}{6}\right)$ d) $\left(\frac{41\pi}{48}, \pi\right)$

19. If $\tan A - \tan B = x$ and $\cot B - \cot A = y$, then $\cot(A - B)$ is equal to

a) $\frac{1}{x} + y$ b) $\frac{1}{xy}$ c) $\frac{1}{x} - \frac{1}{y}$ d) $\frac{1}{x} + \frac{1}{y}$

20. In a ΔABC, if a, c, b are in A.P., then the value of $\frac{a\cos B - b\cos A}{a - b}$, is

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