MATHS

BOOKS - NEW JYOTHI MATHS (TAMIL ENGLISH)

TRIGONOMETRIC FUNCTIONS

Examples

1. Find the degree measure corresponding to $\frac{11}{14}$ radian (use $\pi = \frac{22}{7}$)

Watch Video Solution

2. convert $20^\circ 40'$ into radian measure .

Watch Video Solution

3. find the angle described by the minute hand of a watch in 60 minutes

Watch Video Solution

4. Find the measure of the angle made by the minute hand in 40 minutes

Watch Video Solution

5. the minute hand of a watch is 1.5 cm long . Find the distance covered by its tip in 40 minutes (use $\pi = 3.14$

Watch Video Solution

6. The arcs of sample in two circles subtend 60° and 75° at the centre . Find the ratio of their radii.

Watch Video Solution

7. find the value of $\sin 15^\circ$

Watch Video Solution

8. Find the value of $\cos 75^\circ$

Watch Video Solution

9. Show that

$$\sin(40^\circ + x)\cos(10^\circ + x) - \cos(40^\circ + x)\sin(10^\circ + x) = \frac{1}{2}$$

Watch Video Solution

10. Calculate $\cos 75^\circ$ and $\cos 15^\circ$ using the values of $\cos 45^\circ$ and $\cos 30^\circ$

Watch Video Solution

11. Prove that

$$\cos\left(\frac{\pi}{4}-x\right)\cos\left(\frac{\pi}{4}-y\right)-\sin\left(\frac{\pi}{4}-x\right)\sin\left(\frac{\pi}{4}-y\right)=\sin(x+y)$$

Watch Video Solution

12. Show that $\frac{\sin x+\sin y}{\cos x+\cos y}=\tan\frac{x+y}{2}$

Watch Video Solution

13. Prove that $(\cos x-\cos y)^2+(\sin x-\sin y)^2=4\sin^2\frac{(x-y)}{2}$

Watch Video Solution

14. show that $\frac{\cos\left(\frac{x}{2}\right)+\sin\left(\frac{x}{2}\right)}{\cos\left(\frac{x}{2}\right)-\sin\left(\frac{x}{2}\right)}=\sec x+\tan x$

Watch Video Solution

15. Prove that $\frac{\sin 5x - 2\sin 3x + \sin x}{\cos 5x - \cos x} = \tan x$

Watch Video Solution

16. Prove that $\frac{\cos 3x + \cos 7x - \cos 2x}{\sin 7x - \sin 3x - \sin 2x} = \cot 2x$

Watch Video Solution

17. Show that $\frac{\cos 8A \cos 5A - \cos 12A \cos 9A}{\sin 8A \cos 5A + \cos 12A \sin 9A} = \tan 4A$

Watch Video Solution

18. Prove that $\cos 2x \cos \frac{x}{2} - \cos 3x \cos \frac{9x}{2} = \sin 5x \sin \frac{5x}{2}$

Watch Video Solution

19. Prove that $\cos\left(\frac{3\pi}{4} + x\right) - \cos\left(\frac{3\pi}{4} - x\right) = -\sqrt{2}\sin x$

Watch Video Solution

20. prove that $\frac{\sin x - \sin y}{\cos x + \cos y} = \tan \frac{x - y}{2}$

Watch Video Solution

21. Find the principal solutions of $\sin x = \frac{\sqrt{3}}{2}$

Watch Video Solution

22. find the principal and general solutions of the equation $\cos x = \frac{-\sqrt{3}}{2}$

Watch Video Solution

23. Find the general solutions of the equation $\sin x = \frac{\sqrt{3}}{2}$

Watch Video Solution

24. Solve $2\cos^2 x + 3\sin x = 0$

Watch Video Solution

25. solve the equation $\tan^2\theta + \cot^2\theta = 2.$

Watch Video Solution

26. find the general solution for $\cos 4x = \cos 2x$

Watch Video Solution

27. Find the general solution for $\sin 2x + \cos x = 0$

Watch Video Solution

28. find the general solution for $\sec^2 2x = 1 - \tan 2x$

Watch Video Solution

29. find the general solution for $\sin x + \sin 3x + \sin 5x = 0$

Watch Video Solution

30. Prove that $2\cos\frac{\pi}{13}\cos\frac{9\pi}{13} + \cos\frac{3\pi}{13} + \cos\frac{15\pi}{13} = 0$

Watch Video Solution

31. prove that $\frac{(\sin 7x + \sin 5x) + (\sin 9x + \sin 3x)}{(\cos 7x + \cos 5x) + (\cos 9x + \cos 3x)} = \tan 6x$

Watch Video Solution

32. Prove that $\sin 3x + \sin 2x - \sin x = 4\sin x \cos\frac{x}{2}\cos\frac{3x}{2}$

Watch Video Solution

Exercise

1. The equation $\sec^2\theta = \frac{4xy}{(x+y)^2}$ is possible for x,y, $\in R$ only if

A. $x + y = 2xy$

B. $x + y = xy$

C. $x + y = 1$

D. $x = y$

Answer: D

Watch Video Solution

2. $\sin\theta = \frac{x+Y}{2\sqrt{xy}}$ is possible

A. all real x,y

B. $x, y > 0$

C. $x = y \neq 0$

D. no real x,y

Answer: C

Watch Video Solution

3. $\frac{\tan(-225^\circ)\tan(570^\circ)\sec(675^\circ)}{\cot(135^\circ)\tan(240^\circ 2)\cos cec(-45^\circ)}$ is

A. $\frac{\sqrt{3}}{2}$

B. $\frac{1}{2sqt(3)}$

C. $\frac{-1}{\sqrt{3}}$

D. $-\frac{1}{3}$

Answer: D

Watch Video Solution

4. If $\tan\theta = \frac{-4}{3}$ then $\text{cosec}\theta$ is

Watch Video Solution

5. IF

$(\sec A - \tan A)(\sec B - \tan B)(\sec C - \tan C) = (\sec A + \tan A)(\sec B +$

then each is equal to

A. 0

B. 1

C. $\sqrt{2}$

D. ± 1

Answer: D

Watch Video Solution

6. The value of $\tan 31^\circ \tan 33^\circ \tan 35^\circ \tan 50^\circ$ is

A. 0

B. 1

C. 2

D. $-\sqrt{2}$

Answer: B

Watch Video Solution

7. If $\frac{\pi}{2} < \theta < 3\frac{\pi}{2}$ then $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} - \tan\theta$ is

A. $\sec\theta$

B. $\text{cosec}\theta$

C. $-\sec\theta$

D. $-\sec\left(\frac{\theta}{2}\right)$

Answer: C

Watch Video Solution

Watch Video Solution

8. $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}}+\sqrt{\frac{1-\cos\theta}{1+\cos\theta}}(0<\theta<\pi)$ is

A. 2

B. $2\sin\theta$

C. $2\cos ec\theta$

D. $2\cos\theta$

Answer: C

Watch Video Solution

9. If $\tan\theta=\frac{1}{b}$, then $\frac{a\sin\theta-b\cos\theta}{a\sin\theta+b\cos\theta}$ is

Watch Video Solution

10. if $\frac{\cos A+\cos B}{\sin A+\sin B}=k\left(\frac{\sin A-\sin B}{\cos A-\cos B}\right)$ then k is

A. 1

B. 2

C. $\frac{1}{2}$

D. -1

Answer: D

Watch Video Solution

11. in a cyclic quadrilateral ABCD , $\cos A + \cos B + \cos C + \cos d$ is

A. 1

B. 0

C. π

D. 2

Answer: B

View Text Solution

12. If $\tan x - \tan y = a$ and $\cot y - \cot x = b$, then cot (x-y) is

A. $a + b$

B. $\frac{1}{a} - \frac{1}{b}$

C. $\frac{1}{a} + \frac{1}{b}$

D. $a - b$

Answer: C

Watch Video Solution

13. If $\tan 25^\circ = a$ then $\frac{\tan 155^\circ - \tan 115^2}{1 + \tan 155^2 \tan 115^\circ}$ is

A. $\frac{1 - a^2}{a}$

B. $\frac{1 - a^2}{2a}$

C. $\frac{2a}{1 - a^2}$

D. $\frac{a}{a-a^2}$

Answer: B

Watch Video Solution

14. $\sin^2\frac{2\pi}{7}+\sin^2\frac{3\pi}{14}+\sin^2\frac{11\pi}{14}+\sin^2\frac{5\pi}{7}$ is

A. 1

B. $\frac{3}{2}$

C. 2

D. 3

Answer: C

Watch Video Solution

15. $\cos^2\frac{\pi}{8}+\cos^2\frac{3\pi}{8}+\cos^2\frac{5\pi}{8}+\cos^2\frac{7\pi}{8}$ is

A. 1

B. 2

C. -2

D. $\sqrt{2}$

Answer: B

Watch Video Solution

16. The minimum value of $7\cos\theta + 24\sin\theta$ is

A. 25

B. -25

C. 6

D. 0

Answer: D

Watch Video Solution

17. $\sec\left(\frac{\pi}{4}+\theta\right).\sec\left(\frac{\pi}{4}-\theta\right)$ is equal to

A. $\frac{\sec^2(\pi)}{4}-\operatorname{cosec}^2\theta$

B. 1

C. 0

D. $2\sec^2\theta$

Answer: D

Watch Video Solution

18. If $\sin A+\cos A=m$ then $\sin^6 A+\cos^6 A$ is

A. $\frac{4-3\left(m^2-1\right)^2}{4}$

B. $\frac{4+3\left(m^2-1\right)^2}{4}$

C. $\frac{3+4\left(m^2-1\right)^2}{4}$

D. $\frac{3-4\left(m^2-1\right)^2}{4}$

Answer: A

Watch Video Solution

19. $\frac{\cot\theta+\operatorname{cosec}\theta-1}{\cot\theta-\operatorname{cosec}\theta+1}$ is

A. $\cos ec\theta+\cot\theta$

B. $\cos ec\theta-\cot\theta$

C. $\cot\theta$

D. $\cos ec\theta$

Answer: A

Watch Video Solution

20. If $\frac{\sin(A+B)}{\sin(A-B)}=\frac{x+y}{x-y}$, then $\frac{x}{y}$

A. $\frac{x}{y} = \frac{\tan A}{\tan B}$

B. $\frac{x}{y} = \frac{\tan B}{\tan A}$

C. $\frac{x}{y} = \frac{-\tan A}{\tan B}$

D. $\frac{x}{y} = \frac{-\tan B}{\tan A}$

Answer: A

Watch Video Solution

21. Let $0 < a < 1$. if tan A =a and tan $B = \frac{1-a}{1+a}$ then a possible value of A +B is

A. 0

B. $\frac{\pi}{2}$

C. $\frac{\pi}{4}$

D. $\frac{\pi}{3}$

Answer: C

Watch Video Solution

22. $\frac{\sin^2 3A}{\sin^2 A} - \frac{\cos^2 3A}{\cos^2 A}$ is

A. $4\cos 2A$

B. $8\cos 2A$

C. $\frac{1}{8}\cos 2A$

D. 4

Answer: B

Watch Video Solution

23. If $\cos A = \frac{3}{4}$ then $\sin\frac{A}{2}.\sin 5\frac{A}{2}$ is

A. $\frac{1}{32}$

B. $\frac{11}{8}$

C. $\frac{11}{32}$

D. $\frac{11}{16}$

Answer: C

Watch Video Solution

24. $\cos A + \cos(120^\circ + A) + \cos(120^\circ - A)$ is

A. 0

B. 1

C. $\frac{3}{2}$

D. $\frac{2}{3}$

Answer: A

Watch Video Solution

25. $\cos^3 A + \cos^3(120 + A) + \cos^3(120 - A)$ is

A. 0

B. $\cos 3A$

C. $\frac{3}{4}\cos 3A$

D. $\frac{4}{3}\cos 3A$

Answer: C

Watch Video Solution

26. $\cos A.\cos(120^\circ + A).\cos(120^\circ - A)$ is

A. 0

B. $\cos 3A$

C. $\frac{1}{4}\cos 3A$

D. $\frac{4}{3}\cos 3A$

Answer: C

Watch Video Solution

27. $\tan 6^\circ . \tan 42^\circ . \tan 66^\circ . \tan 78^\circ$ is

A. 1

B. -1

C. 2

D. -2

Answer: A

Watch Video Solution

28. $\tan 3A - \tan 2A - \tan A$is

A. 0

B. 1

C. 2

D. -2

Answer: C

View Text Solution

29. IF $\tan 18^\circ$ and $\tan 27^\circ$ are the roots of $ax^2 - bx + c = 0$ then

A. $a + b + c = 1$

B. $a - b - c = 0$

C. $a + b = c$

D. $a + b + c = 0$

Answer: B

Watch Video Solution

30. If $\sin\theta + \cos\theta\theta = \sqrt{2}\cos\theta$ then $\cos\theta - \sin\theta$ is

A. $\sqrt{2}\cos\theta$

B. $\sqrt{2}\sin\theta$

C. $\pm\sqrt{2}\sin\theta$

D. $\sqrt{2}(\cos\theta+\sin\theta)$

Answer: B

Watch Video Solution

31. If $\sin A, \cos A, \tan A$ are in G.P then $\cot^6 A - \cot^2 A$ is

A. 1

B. 2

C. $3\sqrt{3}$

D. -1

Answer: A

Watch Video Solution

32. IF $\tan\alpha = \dfrac{\sin\alpha - \cos\alpha}{\sin\alpha + \cos\alpha}$, then $\sin\alpha + \cos\alpha$ is

A. $\pm\cos\alpha$

B. $\pm\sqrt{2}\cos\alpha$

C. $\pm\sqrt{2}\sin\alpha$

D. $\pm\sin\alpha$

Answer: B

Watch Video Solution

33. If $x\sin^3\alpha + y\cos^3\alpha = \sin\alpha\cos\alpha$ and $x\sin\alpha - y\cos\alpha = 0$, then $x^2 + y^2$ is

A. 0

B. 1

C. $\sqrt{2}$

D. 2

Answer: B

Watch Video Solution

34. IF $11\theta = \pi$ then $\cos\theta.\cos 2\theta.\cos 3\theta\cos 4\theta.\cos 5\theta$ is

A. $\frac{1}{5}$

B. $\frac{1}{11}$

C. $\frac{1}{32}$

D. $\frac{1}{11\sin\theta}$

Answer: C

Watch Video Solution

35. IF $\cos(\alpha+\beta) = 0$ then $\sin(\alpha+2\beta)$ is equal to

A. $\sin\beta$

B. $\sin\alpha$

C. $\cos\beta$

D. $\cos\alpha$

Answer: B

Watch Video Solution

36. $\cot 7\frac{1}{2^\circ}$ is equal to

A. $\sqrt{6}-\sqrt{4}+\sqrt{3}-\sqrt{2}$

B. $\sqrt{6}+\sqrt{4}-\sqrt{4}-\sqrt{3}-\sqrt{2}$

C. $\sqrt{6}-\sqrt{4}-\sqrt{3}+\sqrt{2}$

D. $\sqrt{6}+\sqrt{4}+\sqrt{3}+\sqrt{2}$

Answer: D

Watch Video Solution

37. if α, β are two distinct solutions of $a\sin\theta + b\cos\theta = c$ than tan $\frac{\alpha+\beta}{2}$ is equal to

A. $\frac{C}{\sqrt{a^2+b^2}}$

B. $\frac{c}{a+b}$

C. $\frac{a}{b}$

D. $\frac{c}{a-b}$

Answer: C

Watch Video Solution

38. If $\sin\beta$ is the G.M between $\sin\alpha$ and $\cos\alpha$, then $\cos 2\beta$ is

A. $2\sin^2\left(\frac{\pi}{4}-\alpha\right)$

B. $2\cos^2\left(\frac{\pi}{4}-\alpha\right)$

C. $2\cos^2\left(\frac{\pi}{2}+\alpha\right)$

D. $2\sin^2\left(\frac{\pi}{2}+\alpha\right)$

Answer: A

Watch Video Solution

39. $\sqrt{2+\sqrt{2+\sqrt{2+\sqrt{2+\sqrt{2}....}}}}$

A. -1

B. 2

C. -2

D. 1

Answer: B

Watch Video Solution

40. The equation $2\sin^2 x+7\sin x+6=0$ has

A. two solutions

B. one solution

C. infinite number of solutions

D. no solution

Answer: D

Watch Video Solution

41. The general solution of $4\sin^2 x - 1 = 0$ is

A. $2n\pi \pm \frac{\pi}{3}$

B. $n\pi \pm \frac{\pi}{6}$

C. $2n\pi \pm \frac{\pi}{6}$

D. $n\pi \pm \frac{\pi}{3}$

Answer: B

Watch Video Solution

42. The general solution of $\tan A + \tan 2A + \sqrt{3}\tan A.\tan 2A = \sqrt{3}$ is

A. $n\pi + \frac{\pi}{3}$

B. $(3n+1)\frac{\pi}{9}$

C. $2n\pi \pm \frac{\pi}{6}$

D. $n\pi \pm \frac{\pi}{3}$

Answer: B

Watch Video Solution

43. IF $\tan(\pi\cos\theta) = \cot(\pi\sin\theta)$ then $\cos\left(\theta - \frac{\pi}{4}\right)$ is equal to

A. $\frac{1}{2\sqrt{2}}$

B. $\frac{1}{\sqrt{2}}$

C. $\frac{1}{2}$

D. $2\sqrt{2}$

Answer: A

Watch Video Solution

44. IF $\tan 2\theta . \tan\theta = 1$then θ is

A. $2n\pi + \frac{\pi}{3}$

B. $n\pi \pm \frac{\pi}{6}$

C. $2n\pi \pm \frac{\pi}{6}$

D. $n\pi \pm \frac{\pi}{3}$

Answer: B

Watch Video Solution

Questions From Competitive Exams

1. If $A + B + C = 90^\circ$ then

$$\frac{\cot A + \cot B + \cot C}{\cot A \cot B \cot C} =$$

A. 1

B. $\cot A \cot B \cot C$

C. -1

D. 0

Answer: A

Watch Video Solution

2. IF $\tan 20^\circ = p$, then $\frac{\tan 160^\circ - \tan 110^\circ}{1 + \tan 160^\circ \tan 110^\circ} =$

A. $\frac{(1+p^2)}{(2p)}$

B. $\frac{2p}{(1-p^2)}$

C. $\frac{(1+p)}{(2p)}$

D. $\frac{(1-p^2)}{(2p)}$

Answer: A

Watch Video Solution

3. the solution of $\sin^3\theta\cos\theta - \sin\theta\cos^3\theta = \frac{1}{4}$ is

A. $\left(\frac{n\pi}{4}\right) + (-1)^n\left(\frac{\pi}{8}\right)$

B. $\left(\frac{n\pi}{2}\right) \pm \left(\frac{\pi}{8}\right)$

C. $\left(\frac{n\pi}{4}\right) + (-1)^{n+1}\left(\frac{\pi}{8}\right)$

D. $\left(\frac{n\pi}{8}\right) + (-1)^n\left(\frac{\pi}{8}\right)$

Answer: C

Watch Video Solution

4. In a triangle ABC , $a = 2, b = 3$ and $\sin A = \frac{2}{3}$ then cos C=

A. $\frac{1}{2}$

B. $\frac{1}{3}$

C. $\frac{2}{\sqrt{13}}$

D. $\frac{2}{3}$

Answer: D

Watch Video Solution

5. In ΔABC if $a \to 2C$ and $b \to 3C$, then cos B tends to

A. -1

B. $1/2$

C. $1/3$

D. $2/3$

Answer: A

Watch Video Solution

6. If $\sin(\pi\cos\theta) = \cos(\pi\sin\theta)$, then which of the following is correct ?

A. $\cos\theta = \dfrac{3}{2\sqrt{2}}$

B. $\cos\left(\theta - \dfrac{\pi}{2}\right) = \dfrac{1}{2\sqrt{2}}$

C. $\cos\left(\theta - \dfrac{\pi}{4}\right) = \dfrac{1}{2\sqrt{2}}$

D. $\cos\left(\theta + \dfrac{\pi}{4}\right) = \dfrac{-1}{2\sqrt{2}}$

Answer: C

Watch Video Solution

7. The value of $\sin 12^\circ \sin 48^\circ \sin 54^\circ$ is equal to

A. $2/3$

B. $1/2$

C. $1/8$

D. $1/3$

Answer: C

Watch Video Solution

8. The shadow of a pole is $\sqrt{3}$ times longer the angle of elevation of sun is equal to

A. 45°

B. $\frac{45^\circ}{2}$

C. 60°

D. 30°

Answer: D

Watch Video Solution

9. IF the sides of a triangle are $x^2 + x + 1, x^2 - 1$ and $2x + 1$ then the greatest angle is

A. 90°

B. 135°

C. 115°

D. 120°

Answer: D

Watch Video Solution

10. The value of $\cos 1^\circ . \cos 2^\circ , \cos 3^\circ \cos 179^\circ$ is equal to

A. $\frac{1}{\sqrt{2}}$

B. 0

C. 1

D. -1

Answer: B

Watch Video Solution

11. IF $\cot(\alpha+\beta)=0$ then sin $(\alpha+2\beta)$ is equal to

A. $\sin\alpha$

B. $\cos\alpha$

C. $\sin\beta$

D. $\cos 2\beta$

Answer: A

Watch Video Solution

12. The value of 4 sin A $\cos^3 A - 4\cos\sin^3 A$ is equal to

A. `cos 2A

B. sin 3A

C. sin 2A

D. sin 4A

Answer: D

Watch Video Solution

13. if the solution for θ of $\cos p\theta + \cos q\theta = 0$ $p > q > 0$ are in AP. Then the numerically smallest common difference of AP is

A. $\frac{\pi}{p+q}$

B. $\frac{2\pi}{p+q}$

C. $\frac{\pi}{2(p+q)}$

D. $\frac{1}{p+q}$

Answer: B

Watch Video Solution

14. Find the value of k for which (cos x + sin x)^2 + k sin x cos x-1=0 is an identity

A. -1

B. -2

C. 0

D. 1

Answer: B

Watch Video Solution

15. The angles of a triangle ABC, are in Arithmetic progression and if b : c = $\sqrt{3}:\sqrt{2}$, find $\angle A$

A. 105°

B. 60°

C. 45°

D. 75°

Answer: D

Watch Video Solution

16. The angles of a triangle are in the ratio 1:3:5 then the greatest angle is

A. $5\pi/9$

B. $2\pi/9$

C. $7\pi/9$

D. $11\pi/9$

Answer: A

Watch Video Solution

17. A circular wire of radius 7 cms is cut and bend again into and arc of circle of radius 12 cms . Then angle subtended by the are at the centre is

A. 50°

B. 210°

C. 100°

D. 60°

Answer: B

Watch Video Solution

18. IF tan A + cot A=4 , then $\tan^4 A + \cot^4 A$ is equal to

A. 110

B. 191

C. 80

D. 194

Answer: D

Watch Video Solution

19. If $\tan\left(\frac{\theta}{2}\right) = t$ then $\frac{1-t^2}{1+t^2}$ is equal to

A. $\cos\theta$

B. $\sin\theta$

C. $\sec\theta$

D. $\cos 2\theta$

Answer: A

Watch Video Solution

20. The period of the function $y = \sin 2x$ is

A. 2π

B. π

C. $\pi/2$

D. 4π

Answer: B

Watch Video Solution

21. If the angle of elevation of the top of a tower at a distance 500 metres from its foot is 30° then the height of the tower is

A. $1/3$

B. $500\sqrt{3}$

C. $\sqrt{3}$

D. $500/\sqrt{3}$

Answer: D

Watch Video Solution

22. In triangle ABC, $a\left(b^2+c^2\right)\cos A+b\left(c^2+a^2\right)\cos B+c\left(a^2+b^2\right)\cos C$ is equal to

A. abc

B. 2 abc

C. 3 abc

D. 4abc

Answer: C

Watch Video Solution

23. The measures of the sides of a triangle are $3, 5$ and 7 then the greatest angle is

A. 60°

B. 100°

C. 90°

D. 120°

Answer: D

Watch Video Solution

24. IF x sin $45^\circ \cos^2 60^\circ = \frac{\tan^2 60^\circ \operatorname{cosec} 30^\circ}{\sec 45^\circ \cot^2 30^\circ}$ then x=

A. 2

B. 7

C. 8

D. 16

Answer: C

Watch Video Solution

25. IF $\tan(A-B)=1, \sec(A+B)=\frac{2}{\sqrt{3}}$, the smallest positive value of B is

A. $\frac{25}{24}\pi$

B. $\frac{19}{24}\pi$

C. $\frac{13}{24}\pi$

D. none of these

Answer: D

Watch Video Solution

26. If $\sec\theta+\tan\theta=k$, $\cos\theta$=

A. $\frac{k^2+1}{2k}$

B. $\frac{2k}{k^2+1}$

C. $\frac{k}{k^2+1}$

D. $\frac{k}{k^2-1}$

Answer: B

Watch Video Solution

27. IF α, β and γ are angles such that $\tan\alpha+\tan\beta+\tan\gamma=\tan\alpha\tan\beta\tan\gamma$ and $x=\cos\alpha+i\sin\alpha, y=\cos$ and $z=\cos\gamma+i\sin\gamma$, then xyz =

A. 1, but not -1

B. -1 but not 1

C. $+1$ or -1

D. 0

Answer: B

Watch Video Solution

28. If $n = 1, 2, 3, \ldots\ldots$ then $\cos\alpha \cos 2\alpha \cos 4\alpha \ldots\ldots \cos 2^{n-1}\alpha$ is equal to

A. $\frac{\sin 2n\alpha}{2n \sin \alpha}$

B. $\frac{\sin 2^n \alpha}{2^n \sin 2^{n-1}\alpha}$

C. $\frac{\sin 4^{n-1}\alpha}{4^{n-1} \sin \alpha}$

D. $\frac{\sin 2^n \alpha}{2^n \sin \alpha}$

Answer: D

Watch Video Solution

29. IF $a = \frac{\pi}{18}$ radius then $\cos a + \cos 2a + \ldots. + \cos 18a =$

A. 0

B. -1

C. 1

D. ± 1

Answer: B

Watch Video Solution

30. 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

Answer: D

View Text Solution

31. for any angle θ the expression $\frac{2\cos 8\theta + 1}{2\cos\theta + 1}$ is equal to

A. $(2\cos\theta+1)(2\cos 2\theta+1)(2\cos 4\theta+1)$

B. $(\cos\theta-1)(\cos 2\theta-1)(\cos 4\theta-1)$

C. $(2\cos\theta-1)(2\cos\theta-1)(2\cos 4\theta-1)$

D. $(2\cos\theta+1)(2\cos 2\theta+1)(2\cos 4\theta+1)$

Answer: C

Watch Video Solution

32. IF m tan $(\theta-30^\circ)=n\tan\left(\theta+120^2\right)$ then $\cos 2\theta$ equals

A. $\frac{m+n}{m-n}$

B. $\frac{m-n}{m+n}$

C. $\frac{m-n}{2(m-n)}$

D. $\frac{m+n}{2(m-n)}$

Answer: D

View Text Solution

33. If $x + \frac{1}{x} = 2\sin\alpha, y + \frac{1}{y} = 2\cos\beta,$ then $x^3y^3 + \frac{1}{x^3y^3}$ is

A. A. $2\cos 3(\beta = \alpha)$

B. B. $2\cos 3(\beta + \alpha)$

C. C. $2\sin 3(\beta - \alpha)$

D. D. $2\sin 3(\beta + \alpha)$

Answer: C

Watch Video Solution

34. If f (x) $= \cos(\log_e x)$ then

$f(x).\, f(y) - \frac{1}{2}\left[f\left(\frac{y}{x}\right) + f(xy)\right]$ has the value

A. 1

B. $\frac{1}{2}$

C. -2

D. 0

Answer: D

Watch Video Solution

35. the number of solution of the equation tanx + sec x = 2 cos x and cos $x \neq 0$ lying in the interval $(0, 2\pi)$ is

A. 2

B. 1

C. 0

D. 3

Answer: A

Watch Video Solution

36. $\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^2 + \ldots\ldots + \sin^2 90^2 =$

A. $8\frac{1}{2}$

B. 9

C. $9\frac{1}{2}$

D. $4\frac{1}{2}$

Answer: C

Watch Video Solution

37. If $1 + \sin x + \sin^2 x + \sin^3 x + \ldots\ldots$ to $\infty = 4 + 2\sqrt{3}, 0 < x < \pi$

then x=

A. $\frac{\pi}{6}$

B. $\frac{\pi}{4}$

C. $\frac{3\pi}{4}$

D. $\frac{\pi}{3}$ or $\frac{2\pi}{3}$

Answer: D

Watch Video Solution

38. The perimeter of a triangles ABC 6 times the arithemetic mean of the sine ratios of its angles if $a = 1, A =$

A. $\frac{\pi}{6}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{2}$

D. $\frac{2\pi}{3}$

Answer: A

Watch Video Solution

39. The base angle of triangle are $22\frac{1}{(2)^{\circ}}$ and $112\frac{1}{(2)^{\circ}}$ if b is the base and h is the height of the triangle , then

A. $b = 2h$

B. $b = 3h$

C. $b = \left(1 + \sqrt{3}\right)h$

D. $b = \left(2 + \sqrt{3}\right)h$

Answer: A

Watch Video Solution

40. If $1 + \cos x = k$ where x is acute , then sin $\frac{x}{2}$

A. $\frac{\sqrt{1-k}}{2}$

B. $\sqrt{2-K}$

C. $\sqrt{\frac{2+k}{2}}$

D. $\sqrt{\frac{2-k}{2}}$

Answer: D

Watch Video Solution

41. The equation $a\cos\theta + b\sin\theta = C$ has a solution , when a,b and c are real numbers scuh that

A. $a < b < c$

B. $a = b = c$

C. $c^2 \leq a^2 + b^2$

D. $c^2 \leq a^2 - b^2$

Answer: C

Watch Video Solution

42. If $\sin\left(\frac{\pi}{4}\cot\theta\right) = \cos\left(\frac{\pi}{4}\tan\theta\right)$, then $\theta =$

A. $2n\pi + \frac{\pi}{4}$

B. $2n\pi \pm \frac{\pi}{4}$

C. $2n\pi - \frac{\pi}{4}$

D. $n\pi + \frac{\pi}{4}$

Answer: D

Watch Video Solution

43. IF $A + B + C = \pi$ then $\cos^2 A + \cos^2 B + \cos^2 C =$

A. $1 - \cos A \cos B \cos C$

B. $1 - 2\cos A \cos B \cos C$

C. $2\cos A \cos B \cos C$

D. $1 + \cos A \cos B \cos C$

Answer: B

Watch Video Solution

44. IF the sides of the triangle are $p, q\sqrt{p^2+q^2+pq}$ then the largest angle is

A. $\frac{\pi}{2}$

B. $\frac{5\pi}{4}$

C. $\frac{2\pi}{3}$

D. $\frac{7\pi}{4}$

Answer: C

Watch Video Solution

45. $\frac{\cos 9^\circ + \sin 9^\circ}{\cos 9^\circ - \sin 9^\circ} =$

A. $\tan 26^\circ$

B. $\tan 81^\circ$

C. $\tan 51^\circ$

D. $\tan 54^\circ$

Answer: D

Watch Video Solution

46. If $\Delta = a^2 - (b-c)^2$ where Δ is the area of triangle ABC then tan A is equal to

A. $\frac{15}{16}$

B. $\frac{8}{17}$

C. $\frac{8}{15}$

D. $\frac{1}{2}$

Answer: C

Watch Video Solution

47. If in a triangle ABC ,$a = 5, b = 4$,A =$\frac{\pi}{2} + B$ then C

A. is $\tan^{-1}\left(\frac{1}{9}\right)$

B. is $\tan^{-1}\frac{1}{40}$

C. can not be evaluated

D. is $2\tan^{-1}\left(\frac{1}{9}\right)$

Answer: D

Watch Video Solution

48. ABC is a right angled isosceles triangles with $\angle B = 90^\circ$ if D is a point on A B so that $\angle DCB = 15^\circ$ and if Ad = 35 cm , then CD=

A. $35\sqrt{2}cm$

B. $70\sqrt{2}cm$

C. $\frac{35\sqrt{2}}{2}cm$

D. $35\sqrt{6}cm$

Answer: A

Watch Video Solution

49. The shadow of a tower is found to be 60 meter shorter when the sun's altitude changes from 30° to 60° the height of the tower from the ground is appoximately equal to

A. 62 cm

B. 301 m

C. 101 m

D. 75 m

Answer: C

Watch Video Solution

50. ABCD is a reactangular field .A vertical lamp post of height 12 m stands at the corner A. If the anngle of elevation of its top from B is 60° and from C is 45° , then the area of the field is

A. $48\sqrt{2}sq.\ m$

B. $48\sqrt{3}sq.\ m$

C. $48sq.\ m$

D. $12\sqrt{2}sq.\ m$

Answer: A

Watch Video Solution

51. If $0 < \phi < \frac{\pi}{2}, x = \sum_{n=0}^{\infty} \cos^{2n}\phi, y\sum_{n=0}^{\infty} \sin^{2n}\phi$ and $z = \sum_{n=0}^{\infty} \cos^{2n}\phi \sin^{2n}\phi,$ then

A. $xyz = xz + y$

B. $xyz = xy + z$

C. $xyz = x + Y + z$

D. $xyz = yz + x$

Answer: B

Watch Video Solution

52. Suppose $o < t < \frac{\pi}{2}$ 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

Answer: A

Watch Video Solution

53. the value

$\cos 480^\circ . \sin 150^\circ + \sin 600^\circ . \cos 390^\circ =$

A. 0

B. 1

C. $\frac{1}{2}$

D. -1

Answer: D

Watch Video Solution

54. If the angles of a triangles are in the ratio 3 : 4: 5 then the ratio of the largest side to the smallest side of the triangle is

A. A. $\frac{\sqrt{3}}{2}$

B. B. $\frac{\sqrt{3}+1}{2\sqrt{2}}$

C. C. $\frac{\sqrt{3}+1}{2}$

D. D. $\frac{\sqrt{3}}{2\sqrt{2}}$

Answer: D

Watch Video Solution

55. IF $\frac{\sin(x+y)}{\sin(x-y)} = \frac{a+b}{a-b}$, then $\frac{\tan x}{\tan y}$=

A. $\frac{a^2}{b^2}$

B. $\frac{a}{b}$

C. $\frac{b}{a}$

D. $\frac{a^2+b^2}{a^2-b^2}$

Answer: B

Watch Video Solution

56. IF $A + B = \frac{\pi}{4}$ then (tan A +1) (tan B+1) equals

A. 1

B. $\sqrt{3}$

C. 2

D. $\frac{1}{\sqrt{3}}$

Answer: C

Watch Video Solution

57. If in a triangle ABC , $a = 15, b = 36, c = 39$ then $\sin\frac{C}{2}$=

A. $\frac{\sqrt{3}}{2}$

B. $\frac{1}{2}$

C. $\frac{1}{\sqrt{2}}$

D. $-\frac{1}{2}$

Answer: D

Watch Video Solution

58. $\frac{1}{\cos 80^\circ} - \frac{\sqrt{3}}{\sin 80^\circ} =$

A. $\sqrt{2}$

B. $\sqrt{3}$

C. 2

D. 4

Answer: D

Watch Video Solution

59. Let ABC be a triangle with $b = 5, c = 11$ if the medium AD is perpendicular to AC , then a =

A. 12

B. 13

C. 14

D. 15

Answer: C

Watch Video Solution

60. A tower subtends an angle α at a point A in the plane of its base and the angle of depression of the foot of the tower at a point b ft hust above A is β . Then the height of the tower is

A. b $\tan \alpha \cot \beta$

B. $b \cot \alpha \tan \beta$

C. $b \cot \alpha \cot \beta$

D. $b \tan \alpha \tan \beta$

Answer: A

Watch Video Solution

61. If in the triangle ABC, $B = 45^\circ$, then $a^4 + b^4 + c^4$=

A. $2a^2\left(b^2 + c^2\right)$

B. $2c^2\left(a^2+b^2\right)$

C. $2b^2\left(a^2+c^2\right)$

D. $2\left(a^2b^2+b^2c^2+c^2a^2\right)$

Answer: C

Watch Video Solution

62. Th period of the function $f(x)=|\sin x|+|\cos x|$ is

A. 2π

B. 3π

C. $\frac{3\pi}{2}$

D. $\frac{\pi}{2}$

Answer: D

Watch Video Solution

63. The period of the function $f(x) = a^{\{\tan(\pi x)\} + x - [x]}$, *where* a gt 0 , [x]` denotes the greatest integer function and x is real number, is

A. π

B. $\frac{\pi}{2}$

C. $\frac{\pi}{4}$

D. 1

Answer: D

Watch Video Solution

64. IF $A + B + C = \pi,$ then $\tan\left(\frac{A}{2}\right)\tan\left(\frac{B}{2}\right) + \tan\left(\frac{B}{2}\right)\tan\left(\frac{C}{2}\right) + \tan\left(\frac{C}{2}\right)\tan\left(\frac{A}{2}\right)$ is

A. $\frac{\pi}{6}$

B. 3

C. 2

D. 1

Answer: D

Watch Video Solution

65. 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. $\frac{\sqrt{3}-1}{\sqrt{3}+1}$

Answer: C

Watch Video Solution

66. In A ΔABC if $\left(\sqrt{3}-1\right)a=2b$, $A=3B$ then c is

A. 60°

B. 120°

C. 30°

D. 45°

Answer: B

Watch Video Solution

67. If $x\sin^3\theta+y\cos^3\theta=\sin\theta\cos\theta$ and $x\sin\theta=y\cos\theta$ then x^2+y^2 is

A. 2

B. 0

C. 3

D. 1

Answer: D

Watch Video Solution

68. In a ΔABC If $\tan\frac{A}{2}=\frac{5}{6}, \tan\frac{C}{2}=\frac{2}{5}$ then

A. a,c,b are in A.P

B. a,b,c are in G.P

C. b,a,c are in A.P

D. a,b,c are in A.P

Answer: D

Watch Video Solution

69. If the angles of triangle are in the ratio 4 :1:1 , then the ratio of the longest side to the perimeter is

A. $\sqrt{3}:2+\sqrt{3}$

B. $1:6$

C. $1:2+\sqrt{3}$

D. $2:3$

Answer: A

Watch Video Solution

70. in a triangle ABC , $(b+c)(bc)\cos A+(a+c)(ac)\cos B+(a+b)(ab)\cos C$ Is

A. $a^2+b^2+c^2$

B. $a^3+b^3+c^3$

C. $(a+b+C)\left(a^2+b^2+c^2\right)$

D. $(a+b+c))(ab+bc+ca)$

Answer: B

Watch Video Solution

71. IF in ΔABC, $\frac{\sin A}{2}\frac{\sin C}{2} = \frac{\sin B}{2}$ and $2s$ is the perimeter of the triangle then s is

A. 2b

B. b

C. 3b

D. 4b

Answer: A

Watch Video Solution

72. ABC is a right angled triangle with $\angle B = 90^\circ$, $a = 6$ cm if the radius of the circumcircle is 5 cm then the area of $\Delta ABC$is

A. 25 cm^2

B. 30cm^2

C. 36cm^2

D. 24cm^2

Answer: D

Watch Video Solution

73. IF $\sin\theta = \sin 15^\circ + \sin 45^\circ$, where $0^\circ < \theta < 90^\circ$, then θ is equal to

A. 45°

B. 54°

C. 60°

D. 75°

Answer: D

Watch Video Solution

74. IF O is at the origin OA is along the x- axis and (-40 ,9) is a point on OB then the value of sin $\angle AOB$ is

A. $\frac{13}{40}$

B. $\frac{7}{41}$

C. $\frac{9}{41}$

D. $\frac{9}{40}$

Answer: C

Watch Video Solution

75. If x=h+a sec θ and $y = k + b\text{cosec}\theta$ then

A. $\frac{a^2}{(x+h)^2} - \frac{b^2}{(y+k)^2} = 1$

B. $\frac{a^2}{(x-h)^2} + \frac{b^2}{(y-k)^2} = 1$

C. $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$

D. $\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$

Answer: B

Watch Video Solution

76. If $\cos\alpha + \cos\beta = 0 = \sin\alpha + \sin\beta$, then $\cos 2\alpha + \cos 2\beta$ is equal to

A. $-2\sin(\alpha+\beta)$

B. $2\cos(\alpha+\beta)$

C. $2\sin(\alpha+\beta)$

D. $-2\cos(\alpha+\beta)$

Answer: D

Watch Video Solution

77. in a triangle with one angle $\frac{2\pi}{3}$ the lengths of the sides form an A.P if the length of the greater side is 7 cm , then the radius of the circumcircle

of the triangle is

A. $\frac{7\sqrt{3}}{3}$cm

B. $\frac{5\sqrt{3}}{3}$cm

C. $\frac{2\sqrt{3}}{3}$ cm

D. $7\sqrt{3}$cm

Answer: A

Watch Video Solution

78. The area of the triangle whose sides are $6, 5, \sqrt{13}$ (in square units) is

A. $5\sqrt{2}$

B. 9

C. $6\sqrt{2}$

D. 11

Answer: B

Watch Video Solution

79. in a triangle ABC , $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$ if $a = \frac{1}{\sqrt{6}}$ then the area of the triangle (in square units) is

A. $\frac{1}{24}$

B. $\frac{1}{8\sqrt{3}}$

C. $\frac{1}{8}$

D. $\frac{1}{24\sqrt{3}}$

Answer: B

Watch Video Solution

80. In any triangle ABC , $c^2 \sin 2B + b^2 \sin 2C$ is equal to

A. $\frac{\Delta}{2}$

B. Δ

C. 2Δ

D. 4Δ

Answer: D

Watch Video Solution

81. A flagpole stands on a building and an observer on a level ground is 300 feet from the base of the builing . The angle of elevation of the bottion of the flagpole is 30° and the height of the flagpole is 50 feet if θ is the angle of elevation of hte top of the flagpole , then $\tan\theta$ is equal to

A. $\frac{2\sqrt{3}+1}{6}$

B. $\frac{\sqrt{3}}{2}$

C. 1

D. $\frac{6\sqrt{3}+1}{6}$

Answer: A

Watch Video Solution

82. IF $A + B = 45^\circ$, then (cot A -1) (cot B-1) is equal to

A. 1

B. $\frac{1}{2}$

C. -1

D. 2

Answer: D

Watch Video Solution

83. The solution of the equilibrium

$[\sin x + \cos x]^{1+\sin 2x} = 2, \ -\pi \leq x \leq \pi$ is

A. $\frac{\pi}{2}$

B. π

C. $\frac{3\pi}{2}$

D. $\frac{\pi}{4}$

Answer: C

Watch Video Solution

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

A. $\sqrt{6}\sin A$

B. $\sqrt{7}\sin A$

C. $\sqrt{6}\cos A$

D. $\sqrt{7}\cos A$

Answer: B

Watch Video Solution

85. IF $\tan A$ and $\tan B$ are the roots of $abx^2 - c^2 + ab = 0$ where a,b,c are the sides of the triangle ABC then the value of $\sin^2 + \sin^2 B + \sin^2 C$ is

A. 1

B. 3

C. 4

D. 2

Answer: D

Watch Video Solution

86. In a triangle ABC ,if $a = 3, b = 4, c = 5$ then the distance between its incentre and circumcentre is

A. $\frac{1}{2}$

B. $\frac{\sqrt{3}}{2}$

C. $\frac{3}{2}$

D. $\frac{\sqrt{5}}{2}$

Answer: D

Watch Video Solution

87. In triangle ABC the value of

$$\frac{\frac{\cot A}{2}\cot\frac{B}{2}-1}{\cot\frac{A}{2}\cot\frac{B}{2}}$$ is

A. $\frac{a}{a+b+c}$

B. $\frac{c}{a+b+c}$

C. $\frac{2a}{a+b+c}$

D. $\frac{2c}{a+b+c}$

Answer: D

Watch Video Solution

88. In a triangle ABC , if $\angle A = 60, a = 5, b = 4$ then c is a root of the equation

A. $c^2 - 5c - 9 = 0$

B. $c^2 - 4c - 9 = 0$

C. $c^2 - 10c + 25 = 0$

D. $c^2 - 5c - 41 = 0$

Answer: B

Watch Video Solution

89. From the top of a tower the angle of depression of a point on the ground is 60° if the distance of this point to tower is $\frac{1}{\sqrt{3}+1}$ metres , then the height of the tower is

A. $\frac{4\sqrt{3}}{2}$ metres

B. $\frac{\sqrt{3}+3}{2}$ metres

C. $\frac{3-\sqrt{3}}{2}$ metres

D. $\frac{\sqrt{3}}{2}$ metres

Answer: C

Watch Video Solution

90. 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. $\frac{2\cos\alpha}{\sqrt{\sin 2\alpha}}$

Answer: A

Watch Video Solution

91. 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. $\frac{5}{13}$

D. $\frac{8}{65}$

Answer: A

Watch Video Solution

92. The number of solution of $\cos 2\theta = \sin\theta \in$ (0, 2 pi)` is

A. 1

B. 2

C. 4

D. 0

Answer: C

Watch Video Solution

93. the value of $\tan 40^\circ + \tan 20^\circ + \sqrt{3}\tan 20^\circ \tan 40^\circ$ is equal to

A. $\sqrt{12}$

B. $\frac{1}{\sqrt{3}}$

C. 1

D. $\sqrt{3}$

Answer: D

Watch Video Solution

94. The period of the function $f(\theta) = 4 + 4\sin^3\theta - 3\sin\theta$ is

A. $\frac{2\pi}{3}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{2}$

D. π

Answer: A

Watch Video Solution

95. The value of x in $\left(0, \frac{\pi}{2}\right)$ satisfying the equation $\sin x \cos x = \frac{1}{4}$ is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{8}$

D. $\frac{\pi}{12}$

Answer: D

Watch Video Solution

96. The period of the function $f(x) = |\sin 2x| + |\cos 8x|$ is

A. 2π

B. π

C. $\frac{2\pi}{3}$

D. $\frac{\pi}{2}$

Answer: D

Watch Video Solution

97. the value of $\cos 20^\circ + \cos 100^\circ + \cos 140^\circ$ is equal to

A. $\frac{1}{2}$

B. $\frac{1}{\sqrt{3}}$

C. $\sqrt{3}$

D. 0

Answer: D

Watch Video Solution

98. if $\frac{-\pi}{2} < \theta < \frac{\pi}{2}$ and $n\theta \neq_0 \frac{\pi}{4}$, then value of $\cot\left(\frac{\pi}{4}+\theta\right)\cot\left(\frac{\pi}{4}-\theta\right)$ is

A. 0

B. -1

C. 1

D. -2

Answer: C

Watch Video Solution

99. If $\sin\theta = 3\sin(\theta+2\alpha)$, then the value of $\tan(\theta+\alpha)+2\tan\alpha$ is

A. 3

B. 2

C. -1

D. 0

Answer: D

Watch Video Solution

100. If $\alpha, \beta, \gamma \in [0, \pi]$ and if α, β, γ are in A.P then $\frac{\sin\alpha - \sin\gamma}{\cos\gamma - \cos\alpha}$ is equal to

A. $\sin\beta$

B. $\cos\beta$

C. $\cot\beta$

D. $2\cos\beta$

Answer: C

Watch Video Solution

101. the value of $\frac{1}{8}(3-4\cos 2\theta+\cos 4\theta)$ is

A. $\cos 4\theta$

B. $\sin 4\theta$

C. $\sin^4\theta$

D. $\cos^4\theta$

Answer: C

Watch Video Solution

102. IF $8\cos 2\theta+8\sec 2\theta=65, 0<\frac{\pi}{2}$, then the value of 4 cos 4θ is equal to

A. $\frac{-33}{8}$

B. $\frac{-31}{8}$

C. $\frac{-31}{32}$

D. $\frac{-33}{32}$

Answer: B

Watch Video Solution

103. The value of $\sqrt{2}(\cos 15^\circ - \sin 15^\circ)$ is equal to

A. $\sqrt{3}$

B. $\sqrt{2}$

C. 1

D. 2

Answer: C

Watch Video Solution

104. if $\cos x = -\frac{4}{5}$, where $x \in [0, \pi]$ then the value of $\cos\left(\frac{x}{2}\right)$ is equal to

A. $\frac{1}{10}$

B. $\frac{2}{5}$

C. $\frac{1}{\sqrt{10}}$

D. $-\frac{2}{5}$

Answer: C

Watch Video Solution

105. the value of $\sec^2\theta + \cos ec^2\theta$ is equal to

A. $\tan^2\theta + \cot^2\theta$

B. $\sec^2\theta \cos ec^2\theta$

C. $\sec\theta \cos ec\theta$

D. $\sin^2\theta \cos^2\theta$

Answer: B

Watch Video Solution

106. if $x \in \left(\frac{\pi}{2}, \pi\right)$, then $\frac{\sec x - 1}{\sec x + 1}$ is equal to

A. $(\operatorname{cosec} x + \cot x)^2$

B. $(\sin x - \cos x)^2$

C. $(\operatorname{cosec} x - \cot x)^2$

D. $(\sec x \tan x)^2$

Answer: C

Watch Video Solution

107. the value of $\sec \frac{2\pi}{3} + \operatorname{cosec} \frac{5\pi}{6}$ is equal to

A. 2

B. -2

C. 4

D. 0

Answer: D

Watch Video Solution

108. If $\frac{\sin x}{\cos x} \times \frac{\sec x}{\cos ecx} \times \frac{\tan x}{\cot x} = 9$, where $x \in \left(0, \frac{\pi}{2}\right)$ then the value of x is equal to

A. $\frac{\pi}{4}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{2}$

D. π

Answer: B

Watch Video Solution

109. One of the principal solutions of $\sqrt{3}\sec x = -2$ is equal to

A. $\frac{2\pi}{3}$

B. $\frac{\pi}{6}$

C. $\frac{5\pi}{6}$

D. $\frac{\pi}{3}$

Answer: C

Watch Video Solution

110. if $\cos\alpha + \sin\alpha = \frac{3}{4}$, then $\sin^6\alpha + \cos^6\alpha$ =

A. $\frac{877}{1024}$

B. $\frac{777}{1024}$

C. $\frac{878}{1024}$

D. $\frac{789}{1024}$

Answer: A

Watch Video Solution

111. If $\cos x + \cos^2 x = 1$, then the value of $\sin^4 x + \sin^6 x$ is equal to

A. $-1 + \sqrt{5}$

B. $\frac{-1-\sqrt{5}}{2}$

C. $\frac{1-\sqrt{5}}{2}$

D. $\frac{-1\sqrt{5}}{2}$

Answer: D

Watch Video Solution

112. IF $\tan\left(\frac{\theta}{2}\right) = \frac{2}{3}$, then $\sec\theta$=

A. $\frac{13}{5}$

B. $\frac{13}{3}$

C. $\frac{3}{13}$

D. $\frac{5}{13}$

Answer: A

Watch Video Solution

113. IF $\sin^{16}\alpha = \frac{1}{5}$ then the value of $\frac{1}{\cos^2\alpha} + \frac{1}{1+\sin^2\alpha} + \frac{2}{1+\sin^4\alpha} + \frac{4}{1+\sin^8\alpha}$ is equal to

A. 2

B. 8

C. 6

D. 10

Answer:

Watch Video Solution

114. Suppose $o < t < \frac{\pi}{2}$ and $\sin t + \cos t = \frac{1}{5}$ then $\tan \frac{t}{2}$ is equal to

A. $2 \sec x$

B. $2 \cos x$

C. $\sec x$

D. $\cos x$

Answer: A

Watch Video Solution

115. Let $\theta \in \left[0, \frac{\pi}{2}\right]$ which one of the following is true ?

A. $\sin^2 \theta > \cos^2 \theta$

B. $\sin^2 \theta < \cos^2 \theta$

C. $\sin \theta > \cos \theta$

D. $\sin \theta + \cos \theta \leq \sqrt{2}$

Answer: D

Watch Video Solution

116. The value of $\tan(1^\circ) + \tan(89^\circ)$ is equal to

A. $\frac{1}{\sin 1^\circ}$

B. $\frac{2}{\sin 2^\circ}$

C. $\frac{2}{\sin 1^\circ}$

D. $\frac{1}{\sin 2^\circ}$

Answer: B

Watch Video Solution

117. Let $S_n = \cos\left(\frac{n\pi}{10}\right), n = 1, 2, 3, \ldots\ldots$ then the value of $\frac{s_1 s_2 \ldots\ldots s_{10}}{s_1 + s_2 + \ldots\ldots\ldots + s_{10}}$ is equal to

A. $\frac{1}{\sqrt{2}}$

B. $\frac{\sqrt{3}}{2}$

C. $2\sqrt{2}$

D. 0

Answer: D

Watch Video Solution

118. If $\sin\theta + \cos ec\theta = 2$, then the value of $\sin^6\theta + \cos ec^6\theta$ is equal to

A. 0

B. 1

C. 2

D. 2^3

Answer: C

Watch Video Solution

119. If $0 < x < \pi$ then

$$\frac{\sin 8x + 7\sin 6x + 18\sin 4x + 12\sin 2x}{\sin 7x + 6\sin 5x + 12\sin 3x} =$$

A. 2

B. $\sin x$

C. $\sin 2x$

D. $2\cos x$

Answer: D

Watch Video Solution

120. the number of solution of tanx + sec x = $2\cos x$ in $[0, 2\pi]$ is

A. 2

B. 3

C. 0

D. 1

Answer: B

Watch Video Solution

121. In a triangle with sides $a, b, c, r_1 > r_2 > r_3$ (which are the ex - radii) then

A. $a > b > c$

B. $a < b < c$

C. $a > b$ and $b < c$

D. $a < b$ and $b > c$

Answer: A

Watch Video Solution

122. the sum of the radii of inscribed and circumscribed circules for an n sides regular polygon of side a, is

A. $\frac{a}{2}\cot\left(\frac{\pi}{2n}\right)$

B. $a\cot\left(\frac{\pi}{2n}\right)$

C. $\frac{a}{4}\cot\left(\frac{\pi}{2n}\right)$

D. $a\cot\left(\frac{\pi}{n}\right)$

Answer: A

Watch Video Solution

123. IF in triangle ABC $a\cos^2\left(\frac{C}{2}\right)c\cos^2\left(\frac{A}{2}\right) = \frac{3b}{2}$ then the sides a,b,and c

A. are in G.P

B. are in H.P

C. satisfy a+ b =c

D. are in A.P

Answer: D

Watch Video Solution

124. Let α, β be such $\pi < \alpha - \beta < 3\pi$ if $\sin\alpha + \sin\beta = \frac{-21}{65}$, and $\cos\alpha\cos\beta = \frac{-27}{65}$ then the value of $\frac{\cos(\alpha-\beta)}{2}$ is

A. $\frac{6}{65}$

B. $\frac{3}{\sqrt{130}}$

C. $-\frac{3}{\sqrt{130}}$

D. $\frac{-6}{65}$

Answer: C

Watch Video Solution

125. If $u = \sqrt{a^2 \cos^2 \theta + b^2 \sin^2 \theta} + \sqrt{a^2 \sin^2 \theta + b^2 \cos^2 \theta}$

then the difference between the maximum and manimum values of ` u^2

is given by

A. $(a + b)^2$

B. $2\sqrt{a^2 + b^2}$

C. $2\left(a^2 + b^2\right)$

D. $(a - b)^2$

Answer: D

Watch Video Solution

126. The sides of a triangle are $\sin \alpha, \cos \alpha$ and $\sqrt{1 + \sin \alpha \cos \alpha}$ for some$0 < \alpha < \frac{\pi}{2}$ then the greater angle of the triangle is

A. 120°

B. 90°

C. 60°

D. 150°

Answer: A

Watch Video Solution

127. A person standing on the bank of a river observes that the angle of elevation of top of a tree on the opposite bank of the river is 60° and when the retires 40 metres away from the tree the angle of elevation becomes 30° the breadth of the river is

A. 40 m

B. 30m

C. 20m

D. 60m

Answer: C

Watch Video Solution

128. In a triangle PQR if $\angle R = \frac{\pi}{2}$ if tan $\left(\frac{P}{2}\right)$ and $\tan\left(\frac{Q}{2}\right)$ are the roots of $ax^2 + bx + c = 0, a \neq 0$ then

A. $b = a + c$

B. $b = c$

C. $c = a + b$

D. $a = b + c$

Answer: C

Watch Video Solution

129. in a triangle ABC, let $\angle C = \frac{\pi}{2}$ if r the in radius and R is the circumradius of the triangle ABC , then 2(r+R) equals

A. $a + b$

B. $b + c$

C. $c + a$

D. $a + b + c$

Answer: A

Watch Video Solution

130. IF in a ΔABC , the altitudes from the vertices A,B,C on opposite sides are in H.P , then sin A , sin B , sin C are in

A. H.P

B. Arithmetic - Geometric propression

C. A.P

D. G.P

Answer: C

Watch Video Solution

131. The number of value of x in the interval $[0, 3\pi]$ satisfying the equation $2\sin^2 + 5\sin x - 3 = 0$ is

A. 4

B. 6

C. 1

D. 2

Answer: A

Watch Video Solution

132. If $0 < x < \pi$ and$\cos x + \sin x = \frac{1}{2}$, then tan x is

A. $\frac{\left(1 - \sqrt{7}\right)}{4}$

B. $\frac{\left(4 - \sqrt{7}\right)}{3}$

C. $-\frac{\left(4+\sqrt{7}\right)}{3}$

D. $\frac{\left(1+\sqrt{7}\right)}{4}$

Answer: C

Watch Video Solution

133. A tower stands at the centre of a circular park .A and B are two points on the boundary of the park such that AB = (=a) subtends an angle of 60° at the foot of the tower ,and the angle of elevation of the top of the tower from A or B is 30° the height of hte tower is

A. $\frac{a}{\sqrt{3}}$

B. $a\sqrt{3}$

C. $\frac{2a}{\sqrt{3}}$

D. $2a\sqrt{3}$

Answer: A

Watch Video Solution

134. AB is a vertical pole with B at the ground level and A at the top . A man finds that the angle of elevation of the point A from a certain point C on the ground is 60° . He moves away from the pole along the line BC to a point D such that CD = 7 m . from D the angle of elevation of the point A is 45 then the height of the pole is

A. $\frac{7\sqrt{3}}{2}\frac{1}{\sqrt{3}+1}m$

B. $\frac{7\sqrt{3}}{2}\frac{1}{\sqrt{3}-1}m$

C. $\frac{7\sqrt{3}}{2}(\sqrt{3}+1)m$

D. $\frac{7\sqrt{3}}{2}(\sqrt{3}-1)m$

Answer: C

Watch Video Solution