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MATHS

BOOKS - CHHAYA PUBLICATION MATHS (BENGALI ENGLISH)

TRIGONOMETRIC RATIOS OF MULTIPLE ANGLES

Iiiustrative Examples

1. Express $\cos 4\theta$ in terms of $\cos \theta$,

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2. Prove that, $\sin^6 x + \cos^6 x = 1 - \frac{3}{4}\sin^2 2x$.

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3. If $\sin A = \frac{3}{5}$,find the values of sin2 A and cos 2 A.

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4. If $\cos A = \frac{12}{13}$, find the value of sin 3A.

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5. If $\sin 2A = \frac{4}{5}$ find the value of $\tan A\left(0 \leq A \leq \frac{\pi}{4}\right)$

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6. Prove that, $2\text{cosec}4\theta - \sec 2\theta = \frac{1 - \tan\theta}{1 + \tan\theta}\text{cosec}2\theta$

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7. Express $u = \sin^6 x + \cos^6 x$ in the form A + B cos 4x, where A and B are constants. Find A and B. Hence, obtain the maximum and minimum values of u.

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8. If $\tan x = \frac{b}{a}$, then the value of $(a \cos 2x + b \sin 2x)$ is equal to-

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9. $If \tan\left(\frac{\pi}{4} - \theta\right) = \frac{1}{2}$ find the value of $\sin 2\theta$

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10. Prove that:$\cot\theta \cot 2\theta + \cot 2\theta \cot 3\theta + 2 = \cot\theta(\cot\theta - \cot 3\theta)$

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11. If $x + \frac{1}{x} = 2\cos\theta$, then $\left(x^3 + \frac{1}{x^3}\right)$ is equal to-

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12. If α and β are positive acute angles and $\cos 2\alpha = \frac{3\cos 2\beta - 1}{3 - \cos 2\beta}$, show that, $\tan\alpha = \sqrt{2}\tan\beta$

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13. $If \tan(\alpha - \beta) = \frac{\sin 2\beta}{5 - \cos 2\beta}$, find the value of $\tan\alpha : \tan\beta$.

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14. Find the value of k from the following relations : $3(\cos 2\phi - \cos 2\theta) = 1 - \cos 2\theta\cos\phi$, $\tan\theta = k\tan\phi$whereθ and ϕ are acu

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15. Show that: $\sin^3\alpha + \sin^3(120^\circ + \alpha) + \sin^3(240^\circ + \alpha) = -\frac{3}{4}\sin 3\alpha$

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16.

If $\frac{n\tan\theta}{\cos^2(\alpha-\theta)} = \frac{m\tan(\alpha-\theta)}{\cos^2\theta}$ then show that $\tan(\alpha-2\theta) = \frac{n-m}{n+m}\tan$

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17. Show that, $\frac{1}{\sin 10^\circ} - \frac{\sqrt{3}}{\cos 10^\circ} = 4$

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18. Show that, $32\sin^6\theta = 10 - 15\cos 2\theta + 6\cos 4\theta - \cos 6\theta$

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19.

$$If \quad a\cos\theta + b\sin\theta = c \quad \text{and} \quad b\cos ec\theta - a\sec\theta = c, \quad \text{prove that } \cot 2\theta =$$

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20. Prove that,$16\cos\frac{2\pi}{15}\cos\frac{4\pi}{15}\cos\frac{8\pi}{15}\cos\frac{16\pi}{15} = 1$

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21. Show that the value of $\sin^2(x+a) + \sin^2(x+\beta) - 2\cos(\alpha-\beta)\sin(x+\alpha)\sin(x+\beta)$ is independent of x.

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22. Prove that,$\text{cosec}\frac{2\pi}{7} + \text{cosec}\frac{3\pi}{7} = \text{cosec}\frac{\pi}{7}$

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23. Prove that ,

$$(1+\sec 2\theta)\left(1+\sec 2^2\theta\right)\left(1+\sec 2^3\theta\right)\ldots\left(1+\sec 2^2\theta\right)=\frac{\tan 2^n\theta}{\tan\theta}$$

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24.

$$If\tan(A+B)=3\tan A, \text{show that } \sin(2A+2B)+\sin 2A=2\sin 2B$$

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25. $If 13\theta=\pi,\quad \text{prove that}\quad \cos\theta\cos 2\theta\cos 3\theta\cos 4\theta\cos 5\theta\cos 6\theta=\frac{1}{2^6}$

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26. Prove that $\cot A+\cot(60^\circ+A)+\cot(120^\circ+A)=3\cot 3A.$

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27. $If \tan\theta = \dfrac{\tan\alpha + \tan\beta}{1 + \tan\alpha\tan\beta}$, show that $\sin 2\theta = \dfrac{\sin 2\alpha + \sin 2\beta}{1 + \sin 2\alpha \sin 2\beta}$

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28. Prove that,

$$\left(1 + \cos\frac{\pi}{8}\right)\left(1 + \cos\frac{3\pi}{8}\right)\left(1 + \cos\frac{5\pi}{8}\right)\left(1 + \cos\frac{7\pi}{8}\right) = \frac{1}{8}$$

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29. Show that, $\dfrac{\sin\theta}{\cos 3\theta} + \dfrac{\sin 3\theta}{\cos 9\theta} + \dfrac{\sin 9\theta}{\cos 27\theta} = \dfrac{1}{2}(\tan 27\theta - \tan\theta)$.

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30. If $\dfrac{\tan 3A}{\tan A} = k$, show that $\dfrac{\sin 3A}{\sin A} = \dfrac{2k}{k-1}$, also show that the value of k cannot lie between $\dfrac{1}{3}$ and 3

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31.

$If \quad \alpha \text{ and } \beta \text{ satisfy the equation } a\cos 2\theta + b\sin 2\theta = c \text{ then show th}$

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32. $If \quad 0 < \theta < \frac{\pi}{2}, \quad \text{then show that} \quad \sin\theta \sin 2\theta \sin 3\theta \leq \frac{9}{16}$

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33. Show that : $\cos\frac{\pi}{11} + \cos\frac{3\pi}{11} + \cos\frac{5\pi}{11} + \cos\frac{7\pi}{11} + \cos\frac{9\pi}{11} = \frac{1}{2}.$

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Multiple Choice Questions

1. $1 - \cos 2\theta =$

A. $2\sin^2\theta$

B. $2\cos^2\theta$

C. $\sin^2\theta$

D. $2\cos^2\theta$

Answer: A

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2. $1-\cos 2\theta =$

A. $2\sin^2\theta$

B. $2\cos^2\theta$

C. $\sin 2\theta$

D. $2\cos 2\theta$

Answer: D

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3. $\dfrac{1-\cos 2\theta}{\sin 2\theta} =$

A. $\sin\theta$

B. $\cos\theta$

C. $\tan\theta$

D. none of these

Answer: C

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4. $\dfrac{1+\tan^2\theta}{1-\tan^2\theta} =$

A. $\cos^2\theta$

B. $\cos 2\theta$

C. $\sec^2\theta$

D. $\sec 2\theta$

Answer: D

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5. $\cot 2\theta + \tan\theta =$

A. sin 2 A

B. cosec 2 A

C. cos 2 A

D. sec2 A

Answer: B

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6. State which of the following statement is not true?

A. $4\cos^3 A = 3\cos 3A + \cos A$

B. The formula of cos 3 A can be deduced from the formula

$\sin 3A = 3\sin A - 4\sin^3 A \text{replacing} A by (90^\circ - A)$

C. $\cos 2\theta = 2\sin\left(\frac{\pi}{4} + \theta\right)\cos\left(\frac{\pi}{4} + \theta\right)$

D. The formula of $\sin 2\theta$ can be obtained replacing

$\theta \text{by} \left(\frac{\pi}{4} + \theta\right)$ in the formula $\cos 2\theta = 2\cos^2\theta - 1$

Answer: A

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7. If $2\cos\theta = x + \frac{1}{x}$ state which of the following is the value of $\cos 2\theta$?

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

B. $\frac{1}{2}\left(x^2 + \frac{1}{x^2}\right)$

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

D. $x^3 + \frac{1}{x^3}$

Answer: B

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8. $If \sin\theta = \frac{3}{5}$ state which of the following is the value of $\cos 2\theta$?

A. $\frac{7}{15}$

B. $\frac{8}{25}$

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

D. $\frac{7}{25}$

Answer: D

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9. If tan A = 3, state which of the following is the value of tan 2 A ?

A. $-\frac{3}{4}$

B. $-\frac{4}{3}$

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

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

Answer: A

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10. If $\sin A = \frac{3}{5}$, state which of the following is the value of sin3 A?

A. $\frac{17}{25}$

B. $\frac{117}{125}$

C. $\frac{24}{25}$

D. $\frac{119}{125}$

Answer: B

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11. $If \cos A = \frac{\sqrt{3}}{2}$ state which of the following is the value of cos 3 A?

A. $\frac{3\sqrt{3}}{8}$

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

C. 0

D. -1

Answer: C

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12. If $\tan x = \frac{b}{a}$, state which of the following is the value of $(a^2 + b^2)\sin 2x$

A. ab

B. 2ab

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

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

Answer: B

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Very Short Answer Type Questions

1. $If \frac{\pi}{2} < \theta < \pi \text{and} \sin\theta = \frac{3}{5} \text{find the value of} \sin 2\theta$

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2. $If \tan 2A = \frac{3}{4}, \text{find the value of} \tan A \left(\frac{\pi}{2} < A < \frac{3\pi}{4}\right)$

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3. $If \cos 2\theta = -\frac{1}{2}, \text{find the value of} \cos\theta$

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4. If $\sin 2A = \frac{4}{5}$, find the value of $\sin A\left(0 \leq A \leq \frac{\pi}{4}\right)$

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5. Prove that, $\cot\theta - \tan\theta = 2\cot 2\theta$

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6. Prove that, $\frac{\cos\alpha + \sin\alpha}{\cos\alpha - \sin\alpha} - \frac{\cos\alpha - \sin\alpha}{\cos\alpha + \sin\alpha} = 2\tan 2\alpha$

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7. Prove that, $\frac{\sin 3\theta}{\sin\theta} - \frac{\cos 3\theta}{\cos\theta} = 2$

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8. Prove that, $\frac{\cot\theta - \tan\theta}{1 - 2\sin^2\theta} = \sec\theta \operatorname{cosec}\theta$

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9. Prove that, $\sin^4 x + \cos^4 x = 1 - \frac{1}{2}\sin^2 2x$

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10. Prove that, $\cos^4 x + \sin^4 x = \frac{1}{2}\left(1 + 2a^2 - a^4\right)$ Where a = sin x + cos x

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11. Prove that, $\frac{\sin\alpha + \cos\alpha}{\cos\alpha - \sin\alpha} = \tan 2\alpha + \sec 2\alpha$

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12. Evaluate: $\frac{96\sin 65^\circ \sin 35^\circ \sin 80^\circ}{\sin 20^\circ + 2\sin 80^\circ \cos 30^\circ}$

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Short Answer Type Questions

1. Prove that, $\cos^2(\theta+\phi)-\sin^2(\theta-\phi)=\cos 2\theta\cos 2\phi$

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2. Prove that, $\dfrac{1+\cos 2\alpha+\sin 2\alpha}{1-\cos 2\alpha+\sin 2\alpha}=\cot\alpha$

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3. Prove that, $\cos^6 A+\sin^6 A=\dfrac{1}{4}\left(1-3\cos^2 2A\right)$

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4. Prove that, $\dfrac{1+\sin 2\theta-\cos 2\theta}{\sin\theta+\cos\theta}=2\sin\theta$

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5. Prove that, $\cot x \cos^2 x - \tan x \sin^2 x = 2 \cot 2x$

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6. Prove that, $\dfrac{\sec 8\alpha - 1}{\sec 4\alpha - 1} = \dfrac{\tan 8\alpha}{\tan 2\alpha}$

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7. Prove that,

$\cos 4x - \cos 4y = 8(\cos x - \cos y)(\cos x + \cos y)(\cos x - \sin x)(\cos x + \sin$

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8. Prove that, $\dfrac{1 + \cos A + \cos 2A}{\sin A + \sin 2A} = \cot A$

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9. Prove that, $\frac{\tan 5A + \tan 3A}{\tan 5 - \tan 3A} = 4\cos 4A \cos 2A$

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10. Prove that, $\frac{\cos 30^\circ - \sin 20^\circ}{\cos 40^\circ + \cos 20^\circ} = \frac{4}{\sqrt{3}}\cos 40^\circ \cos 80^\circ$

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11. Prove that, $4\left(\cos^3 10^\circ + \sin^3 20^\circ\right) = 3(\cos 10^\circ + \sin 20^\circ)$

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12. Prove that, $\frac{\sqrt{3}}{\sin 20^\circ} - \frac{1}{\cos 20^\circ} = 4$

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13. Prove that,$16\cos\frac{\pi}{15}\cos\frac{2\pi}{15}\cos\frac{4\pi}{15}\cos\frac{8\pi}{15} = -1$

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14. Prove that, $\frac{1}{3}\left(\cos^3\alpha\sin 3\alpha+\sin^3\alpha\cos 3\alpha\right)=\frac{1}{4}\sin 4\alpha$

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15. $If\tan^2\alpha=1+2\tan^2\beta$, prove that , $\cos 2\beta=1+2\cos 2\alpha$

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16. $If\sin\alpha+\cos\alpha=\sqrt{2}\cos\alpha$, show that, $\tan 2\alpha=1$

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17. $If\quad 2\cos(\alpha+\beta)\cos(\alpha-\beta)=1$, show that, $\tan^2\alpha=\frac{1-\tan^2\beta}{1+3\tan^2\beta}$

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18. $If \quad \tan\theta = \frac{1}{7} \quad \text{and} \quad \tan\phi = \frac{1}{3} \quad \text{show that,} \cos 2\theta = \sin 4\phi$

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19. $If \quad \tan\theta = \frac{\sin\alpha - \cos\alpha}{\sin\alpha + \cos\alpha}, \text{prove that,} 2\cos^2\theta = 1 + \sin 2\alpha.$

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20. $If \quad \tan^2\theta = 1 + 2\tan^2\phi, \text{show that,} \cos 2\theta + \sin^2\phi = 0.$

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21. $If \quad \tan x = \frac{b}{a}, \text{find the value of} \quad a^2 \cos ec2x + b^2 \sec 2x.$

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22. $If \quad 2\tan\alpha = 3\tan\beta, \quad \text{show that,} \tan(\alpha - \beta) = \frac{\sin 2\beta}{5 - \cos 2\beta}.$

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23. If $\frac{\pi}{2} < \theta < \pi$ and $5\sin^2\theta + 3\cos^2\theta = 4$, find the values of $\sin 2\theta$ and $\cos 3\theta$.

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24. $If \quad x^2 + y^2 = 1$, show that, $\left(3x - 4x^3\right)^2 + \left(3y - 4y^3\right)^2 = 1.$

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25. Express $\sin 5\theta$ in terms of $\sin\theta$

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26. Express $\cos 6\theta$ in terms of $\cos\theta$

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27. Express $\tan 4\theta$ in terms of $\tan\theta$

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28. Express $\cos 4A$ in terms of $\tan A$

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29. Show that, $\sec x = \dfrac{2}{\sqrt{2+\sqrt{2}+2\cos 4x}}$

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30. $If\ \tan x, \tan y, \tan z,$ are in G.P., show that, $\cos 2y = \dfrac{\cos(x+z)}{\cos(x-z)}$

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31. Using the formula $\tan A = \dfrac{\sin 2A}{1 + \cos 2A}$, find the values of $\tan 75^\circ$ and $\cot 22^\circ 30$

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32.

$If \quad 32 \sin^6 \theta = 10 - 15 \cos 2\theta + b \cos 4\theta + \alpha \cos 6\theta$, show that, $\tan \theta \tan 5$

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33.

$If \tan(\alpha + \beta) = a + b$ and $\tan(\alpha - \beta) = a - b$, then show that, $a \tan$

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34.

Show that :$2 \sin^2 \beta + 4 \cos(\alpha + \beta) \sin \alpha \sin \beta + \cos 2(\alpha + \beta) = \cos 2\alpha$

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35.

$If x = \sin\theta + \cos\theta \sin 2\theta$ and $y = \cos\theta + \sin\theta \sin 2\theta$, prove that $(x + y$

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Long Answer Type Questions

1. Prove that, $\cot(\theta + 15^\circ) - \tan(\theta - 15^\circ) = \dfrac{4\cos 2\theta}{1 + 2\sin 2\theta}$

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2. Prove that, $\tan\left(\dfrac{\pi}{4} + \theta\right) + \tan\left(\dfrac{\pi}{4} - \theta\right) = 2\sec 2\theta$

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3. Prove that, $\cos^3\theta\cos 3\theta + \sin^3\theta\sin 3\theta = \cos^3 2\theta$

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4. Prove that, $\cos^3\alpha + \cos^3(120^\circ + \alpha) + \cos^3(240^\circ + \alpha) = \frac{3}{4}\cos 3\alpha$

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5. Prove that, $\tan 70^\circ - \tan 50^\circ + \tan 10^\circ = \sqrt{3}$

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6. Prove that, $\tan\theta\tan\left(\frac{\pi}{3} + \theta\right)\tan\left(\frac{\pi}{3} - \theta\right) = \tan 3\theta$

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7. Prove that, $\tan\theta + 2\tan 2\theta + 4\tan 4\theta + 8\cot 8\theta = \cot\theta$

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8. Prove that, $\cos\frac{\pi}{11}\cos\frac{2\pi}{11}\cos\frac{3\pi}{11}\cos\frac{4\pi}{11}\cos\frac{5\pi}{11} = \frac{1}{32}$

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9. Prove that, $If \quad \theta = \frac{2\pi}{7}, \quad \text{show that}, \sec\theta + \sec 2\theta + \sec 4\theta = -4.$

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10. Prove that,

$If \quad 15\theta = \pi, \text{show that}, \cos\theta\cos 2\theta\cos 3\theta\cos 4\theta\cos 5\theta\cos 6\theta\cos 7\theta = \frac{1}{2^7}$

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11.

$If \quad n\tan\alpha = (n+1)\tan\beta \quad \text{then show that}, \tan(\alpha - \beta) = \frac{\sin 2\beta}{2n + 1 - \cos}$

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12. If $\tan\theta = \cos 2\alpha \tan\phi$, prove that $\tan(\phi - \theta) = \dfrac{\tan^2\alpha \sin 2\phi}{1 + \tan^2\alpha \cos 2\phi}$

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13. $If \tan\theta = \sec 2\alpha$, show that, $\sin 2\theta = \dfrac{1 - \tan^4\alpha}{1 + \tan^4\alpha}$.

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14. Prove that,$8\cos^4\theta = 3 + 4\cos 2\theta + \cos 4\theta$

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15. Prove that,$8\sin^4\theta = 3 - 4\cos 2\theta + \cos 4\theta$

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16. Prove that,$64\cos^3\theta\sin^4\theta = \cos 7\theta - \cos 5\theta - 3\cos 3\theta + 3\cos\theta$

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17. Prove that,

$$\sin^2 A\cos^4 A = \frac{1}{16} + \frac{1}{32}\cos 2A - \frac{1}{16}\cos 4A - \frac{1}{32}\cos 6A$$

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18. $If\tan\theta = \frac{\tan\alpha - \tan\beta}{1 - \tan\alpha\tan\beta}$, show that, $\sin 2\theta = \frac{\sin 2\alpha - \sin 2\beta}{1 - \sin 2\alpha\sin 2\beta}$.

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19.

$If \quad \alpha \quad \text{and} \quad \beta \quad \text{are positive acute angles and} \quad \cos 2\alpha = \frac{n\cos 2\beta - 1}{n - \cos 2\beta}(n >$

show that $\sqrt{n-1}\tan\alpha = \sqrt{n+1}\tan\beta$.

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20. If $\frac{\tan x}{\tan y} = \frac{1+\cos^2 x}{1+\sin^2 x}$ show that $\sin(3x+y) = 7\sin(x-y)$.

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21. $If \sin\theta + \sin 2\theta = a$ and $\cos\theta + \cos 2\theta = b$,

show that, $\left(a^2+b^2\right)\left(a^2+b^2-3\right) = 2b$

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22.

$If \theta = \frac{\pi}{2^n+1}$, show that, $2^n \cos\theta \cos 2\theta \cos 2^2\theta \cos 2^3\theta \ldots \cos 2^{n-1}\theta = 1.$

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23. Prove that,

$(2\cos\theta - 1)(2\cos 2\theta - 1)\left(2\cos 2^2\theta - 1\right)\ldots\left(2\cos 2^{n-1}\theta - 1\right) = \frac{2\cos 2^n\theta + 1}{2\cos\theta + 1}$

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24. $If x - \frac{1}{x} = 2i\sin\theta$, show that, $x^4 - \frac{1}{x^4} = 2i\sin 4\theta$.

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25. Show that,

$(x\tan\alpha + y\cot\alpha)(x\cot\alpha + y\tan\alpha) = (x+y)^2 + 4xy\cot^2 2\alpha$.

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26. $If u = (1+\cos\theta)(1+\cos 2\theta) - \sin\theta\sin 2\theta$,

$v = \sin\theta(1+\cos 2\theta) + \sin 2\theta(1+\cos\theta)$, show that

$u^2 + v^2 = 4(1+\cos\theta)(1+\cos 2\theta)$.

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27. Eliminate $\theta: x = a(\cos\theta + \cos 2\theta), y = b(\sin\theta + \sin 2\theta)$.

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28. If $a\sin\theta + b\cos\theta = c$ and $a\cos ec\theta + b\sec\theta = c$

show that , $\sin 2\theta = \dfrac{2ab}{c^2 - a^2 - b^2}$

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29. If $0 < \alpha < \dfrac{\pi}{2}$ and

$\sin\alpha + \cos\alpha + \tan\alpha + \cot\alpha + \sec\alpha + \cos ec\alpha = 7$ then

show that $\sin 2\alpha$ is a root of $x^2 - 44x - 36 = 0$

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30. $If \sin(x + y) = \dfrac{p}{\sqrt{1 + p^2}}$ and $\cos(x - y) = \dfrac{1}{\sqrt{1 + q^2}}$

then show that $\tan x$ is a root of the equation

$(p+q)z^2 + 2(1-pq)z - (p+q) = 0$

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Multiple Correct Answere Type

1. If in the interval $[0, \pi]$ the value of $5\sin^2\alpha + 3\cos^2\alpha$ be equal to 4, then what will be the value of $\sin 2\alpha$

A. 0

B. -1

C. 2

D. 1

Answer: B::D

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2.

$If 3(\cos 2\phi - \cos 2\theta) = 1 - \cos 2\theta \cos 2\phi \text{and} \tan\theta = k\tan\phi, \quad \text{then the valu}$

A. $\sqrt{2}$

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

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

D. $-\sqrt{2}$

Answer: A::D

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3. If $\sin A = \frac{3}{5}$, then the value of tan 2 A will be-

A. $\frac{24}{7}$

B. $-\frac{24}{7}$

C. $\frac{7}{24}$

D. $-\frac{7}{24}$

Answer: A::B

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4. $If 0 < 4\theta < \pi$, then the value of $\cot\theta - \cot 4\theta$ will be $-$

A. 6

B. 3

C. 4

D. 5

Answer: A::B::C::D

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5.

$If \tan^2 x + 2\tan x.\tan 2y = \tan^2 y + 2\tan y.\tan 2x$, then the value of each

A. 1

B. tan x = tan y

C. tan x = - tan y

D. 0

Answer: A::B::C

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Integer Answer Type

1. The value of the reciprocal of $\sin\frac{\pi}{18}\sin\frac{5}{18}\sin\frac{7\pi}{18}$ is equal to $-$

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2. $If\cos x+\cos y=2,$ then the value of $\sin(x+y) is -$

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3. $\tan^6 20^\circ - 33\tan^4 20^\circ + 27\tan^2 20^\circ =$

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4. Tne value of $\frac{1 - 4\sin 70^\circ . \sin 10^\circ}{2\sin 10^\circ} is -$

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5.

$If \tan(A+B) = 3\tan A and \sin 2(A+B) + \sin 2B = K\sin 2B$, then K is

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Comprehension Type

1. $If \sin 2\alpha = A\sin 2(\alpha+\beta), A \neq 0$, then

$\tan 2\alpha =$

A. $\dfrac{A\sin 2\beta}{1-A\cos 2\beta}$

B. $\dfrac{A\sin 2\beta}{1+A\cos 2\beta}$

C. $\dfrac{A\cos 2\beta}{1-A\sin 2\beta}$

D. $\dfrac{A\sin 2\beta}{1+A\cos 2\beta}$

Answer: A

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2. If $\sin 2\alpha = A\sin 2(\alpha+\beta), A \neq 0,$

then $\tan 2\beta =$

A. $\dfrac{\sin 2\alpha(1+A\cos 2\beta)}{A\cos 2\alpha\cos 2\beta}$

B. $\dfrac{\sin 2\alpha(1-A\cos 2\beta)}{A\cos 2\alpha.\cos 2\beta}$

C. $\dfrac{\cos 2\alpha(1-A\sin\beta)}{A\cos 2\alpha\cos 2\beta}$

D. $\dfrac{\cos 2\alpha(1+A\sin 2\beta)}{A\cos 2\alpha\cos 2\beta}$

Answer: B

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3. $If \sin 2\alpha = A \sin 2(\alpha + \beta), A \neq 0, \text{then}$

Which values of the following are not equal to $\tan 2(\alpha + \beta)$?

A. $\dfrac{\sin 2\beta}{\cos 2\beta - A}$

B. $\dfrac{\sin 2\alpha \cos 2\alpha}{A \cos 2\beta - \sin^2 2\alpha}$

C. $\dfrac{\sin 2\alpha \cos 2\alpha}{A \cos 2\beta + \sin^2 2\alpha}$

D. none of these

Answer: C

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4. $If \sin 2\alpha + \sin 2\beta = 3 \text{and} \cos 2\alpha + \cos 2\beta = 4, \text{then} -$

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

A. $\dfrac{24}{25}$

B. $\frac{13}{25}$

C. $\frac{12}{13}$

D. none of these

Answer: A

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5. $If \sin 2\alpha + \sin 2\beta = 3 \text{and} \cos 2\alpha + \cos 2\beta = 4, \text{then} -$

$\cos 2(\alpha + \beta) =$

A. $\frac{12}{25}$

B. $\frac{7}{25}$

C. $\frac{12}{13}$

D. none of these

Answer: B

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6. $If \sin 2\alpha + \sin 2\beta = 3 \text{and} \cos 2\alpha + \cos 2\beta = 4, \text{then} -$

$\tan 2(\alpha + \beta) =$

A. $\frac{25}{7}$

B. $\frac{25}{12}$

C. $\frac{25}{13}$

D. $\frac{24}{7}$

Answer: D

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