



Maths By Gagan Pratap

Trigonometry Sheet-4

Maths Special Batch
By Gagan Pratap

1. Find the value of the following expression.

निम्नलिखित व्यंजक का मान ज्ञात कीजिए।

$$5(\sin^4\theta + \cos^4\theta) + 3(\sin^6\theta + \cos^6\theta) + 19 \sin^2\theta \cos^2\theta$$

- (a) 8
(b) 5
(c) 6
(d) 7

2. $3(\sin x - \cos x)^4 + 6(\sin x + \cos x)^2 + 4(\sin^6 x + \cos^6 x) = ?$ (CDS 2023)

- a) 11 b) 14 c) 13 d) 12
3. $\left(\frac{1}{\cos\theta} - \frac{1}{\sin\theta}\right) + \frac{1}{\operatorname{cosec}\theta - \cot\theta} - \frac{1}{\sec\theta + \tan\theta} = ?$
(a) $\sec\theta \operatorname{cosec}\theta$ (b) $\sin\theta \tan\theta$
(c) $\operatorname{cosec}\theta \cot\theta$ (d) $\sin\theta \cos\theta$

4. $(\sec\theta + \tan\theta)^2 + \frac{1 + \operatorname{cosec}\theta}{1 - \operatorname{cosec}\theta}$, $0^\circ < \theta < 90^\circ$ is:

$$(\sec\theta + \tan\theta)^2 + \frac{1 + \operatorname{cosec}\theta}{1 - \operatorname{cosec}\theta}, 0^\circ < \theta < 90^\circ \text{ का मान ज्ञात करें।}$$

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

5. If $A + B + C = 90^\circ$, then $\sin \frac{A}{2} \cdot \sin \left(\frac{180-B-C}{2}\right) + \cos \frac{A}{2} \cdot \sin \frac{B+C}{2} = ?$
a) $\frac{1}{2}$ b) $\frac{1}{\sqrt{2}}$ c) 0 d) $\frac{3}{\sqrt{2}}$

6. The expression $(\cos^6\theta + \sin^6\theta - 1)(\tan^2\theta + \cot^2\theta + 2) + 3$ is equal to :

व्यंजक $(\cos^6\theta + \sin^6\theta - 1)(\tan^2\theta + \cot^2\theta + 2) + 3$ का मान ज्ञात कीजिए।

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

7. $(\operatorname{cosec}A - \sin A)^2 + (\sec A - \cos A)^2 - (\cot A - \tan A)^2$ is equal to:

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

8. What is simplified value of $1 + \tan A \cdot \tan\left(\frac{A}{2}\right)$?

- a) $\cos A$ b) $\sin A$ c) $\sec A$ d) $\cot A$

9. Find the value of $\left(\cot \frac{\alpha}{2} \cdot \tan \alpha - 1\right)(2 - \tan \alpha \cdot \sin 2\alpha) = ?$

- a) $2\sec \alpha$ b) $2\sin \alpha$ c) $2\cos \alpha$ d) $2\tan \alpha$



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10. The expression $\sqrt{\sin^4 x + 4\cos^2 x} - \sqrt{\cos^4 x + 4\sin^2 x}$ is equal to:

$\sqrt{\sin^4 x + 4\cos^2 x} - \sqrt{\cos^4 x + 4\sin^2 x}$ का मान ज्ञात करें?

- (a) $\sin 2x$ (b) 1 (c) $\cos 2x$ (d) $-\cos 2x$

11. $\frac{(2\sin A)(1+\sin A)}{1+\sin A+\cos A}$ is equal to:

$\frac{(2\sin A)(1+\sin A)}{1+\sin A+\cos A}$ बराबर है:

- a) $1 - \sin A \cos A$ b) $1 + \sin A - \cos A$
c) $1 + \cos A - \sin A$ d) $1 + \sin A \cos A$

12. $\frac{(\operatorname{cosec} \theta - \sec \theta)(\cot \theta - \tan \theta)}{(\operatorname{cosec} \theta + \sec \theta)(\sec \theta \operatorname{cosec} \theta - 2)} = ?$

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

13. $\cos^2 \theta + \cos^2 (\alpha + \theta) - 2\cos \alpha \cdot \cos \theta \cos (\theta + \alpha) = ?$

- a) $\sin^2 \alpha$ b) $\cos^2 \alpha$ c) $\tan^2 \alpha$ d) $\sec^2 \alpha$

14. $\cos^2 (A - B) + \cos^2 B - 2\cos(A - B) \cdot \cos A \cdot \cos B = ?$

- a) $\cos^2 A$ b) $\sin^2 A$ c) $\tan^2 A$ d) $\cot^2 A$

15. Simplify $\frac{1+\sin t}{4-4\sin t} - \frac{1-\sin t}{4+4\sin t}$?

$\frac{1+\sin t}{4-4\sin t} - \frac{1-\sin t}{4+4\sin t}$ को सरल कीजिए?

- A) $4\tan t \cdot \sin t$
B) $\tan t \cdot \sec t$
C) $\tan t - \sin t$
D) $\tan t + \sin t$

16. $\frac{\sin \theta \cdot \tan \theta}{1-\cos \theta} + (\tan^2 \theta - \sec^2 \theta)$

- a) $\sin \theta \cdot \cos \theta$ b) $\sec \theta$
c) $\tan \theta$ d) $\operatorname{cosec} \theta$

17. $\frac{1-\sin A \cos A}{\cos A (\sec A - \operatorname{cosec} A)} \cdot \frac{\sin^2 A - \cos^2 A}{\sin^3 A + \cos^3 A} = ?$

- a) $\sin A$ b) $\cos A$ c) $\tan A$ d) $\operatorname{cosec} A$

18. What is the value of

$$(1 + \cot A + \tan A)(\sin A - \cos A) \frac{\sin A \cos A}{\sin^3 A - \cos^3 A}$$

$(1 + \cot A + \tan A)(\sin A - \cos A) \frac{\sin A \cos A}{\sin^3 A - \cos^3 A}$ का मान क्या है-

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

19. $1 - \frac{\sin^2 y}{1+\cos y} + \frac{1+\cos y}{\sin y} - \frac{\sin y}{1-\cos y} = ?$

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

20. $\left(\frac{2\sqrt{2}+3\sin A}{1-3\cos A}\right)^5 + \left(\frac{1+3\cos A}{2\sqrt{2}-3\sin A}\right)^5 = ?$

- a) $(2\sqrt{2})^5$ b) 243 c) 0 d) 1

21. The value of $\frac{\sin A}{\cot A + \operatorname{cosec} A} - \frac{\sin A}{\cot A - \operatorname{cosec} A} - 1$ is:

$\frac{\sin A}{\cot A + \operatorname{cosec} A} - \frac{\sin A}{\cot A - \operatorname{cosec} A} - 1$ का मान ज्ञात करें।

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

22. $\frac{\sin x - \cos x + 1}{\sin x + \cos x - 1}$ is equal to?



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a) $\frac{\sin x - 1}{\cos x}$ b) $\frac{\sin x + 1}{\cos x}$ c) $\frac{\sin x - 1}{\cos x + 1}$ d) $\frac{\sin x + 1}{\cos x + 1}$

23. If $\tan^2 \alpha \tan^2 \beta + \tan^2 \beta \tan^2 \gamma + \tan^2 \gamma \tan^2 \alpha + 2 \tan^2 \alpha \tan^2 \beta \tan^2 \gamma = 1$, then $\sin^2 \alpha + \sin^2 \beta + \sin^2 \gamma = ?$

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

24. $\frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A} - \frac{2}{\sin 2A} = ?$

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

25. $\sec \theta \left(\frac{1 + \sin \theta}{\cos \theta} + \frac{\cos \theta}{1 + \sin \theta} \right) - 2 \tan^2 \theta$ is equal to?

a) 4 b) 1 c) 2 d) 0

26. $[(\sec x \sec y + \tan x \tan y)^2 - (\sec x \tan y + \tan x \sec y)^2] = ?$

a) -1 b) 0 c) $\sec^2 x$ d) 1

27. Let $a = \frac{2 \sin x}{1 + \sin x + \cos x}$ and $b = \frac{c}{1 + \sin x}$, If $a = b$, then $c = ?$

माना $a = \frac{2 \sin x}{1 + \sin x + \cos x}$ और $b = \frac{c}{1 + \sin x}$ यदि $a = b$ है, तो $c = ?$

(a) $1 - \sin x \cos x$ (b) $1 + \sin x - \cos x$

(c) $1 + \sin x \cos x$ (d) $1 + \cos x - \sin x$

28. If $x = \frac{2 \sin \theta}{(1 + \cos \theta + \sin \theta)}$, then the value of $\frac{1 - \cos \theta + \sin \theta}{(1 + \sin \theta)}$ is:

यदि $x = \frac{2 \sin \theta}{(1 + \cos \theta + \sin \theta)}$ है, तो $\frac{1 - \cos \theta + \sin \theta}{(1 + \sin \theta)}$ का मान है: (CPO 2022)

(a) $\frac{x}{(1+x)}$ (b) x (c) $1/x$ (d) $(1+x)$

29. If $\operatorname{cosec} \theta - \sin \theta = p^3$ and $\sec \theta - \cos \theta = q^3$, then what is the value of $\tan \theta$?

यदि $\operatorname{cosec} \theta - \sin \theta = p^3$ और $\sec \theta - \cos \theta = q^3$ है तो $\tan \theta$ का मान क्या है?

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

30. $\frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A} = K + \tan A + \cot A$, then $K = ?$

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

31. If $(\sin \theta + \operatorname{cosec} \theta)^2 + (\cos \theta + \sec \theta)^2 = k + \tan^2 \theta + \cot^2 \theta$, then the value of k is equal to:

यदि $(\sin \theta + \operatorname{cosec} \theta)^2 + (\cos \theta + \sec \theta)^2 = k + \tan^2 \theta + \cot^2 \theta$ है, तो k का मान ज्ञात कीजिए।

(a) 7 (b) 2 (c) 9 (d) 5

32. If $2 \frac{\cos^2 x - \sec^2 x}{\tan^2 x} = a + b \cos 2x$, then find a, b?

यदि $\frac{2 \cos^2 x - \sec^2 x}{\tan^2 x} = a + b \cos 2x$ है, तो a, b ज्ञात कीजिये?

A) $-3/2, -1/2$

B) $3/2, 1/2$

C) -3, -1

D) 3, 1

33. If A, B and C are angles of a triangle, then $\sin^2 A + \sin^2 B + \sin^2 C - 2 \cos A \cos B \cos C = ?$

a) 0 b) 1 c) 2 d) 4

34. $\tan^2 \alpha = 1 + 2 \tan^2 \beta$ then find the value of $\sqrt{2} \cos \alpha - \cos \beta = ?$

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

35. If $\tan \theta - \cot \theta = a$ and $\cos \theta + \sin \theta = b$, then $(b^2 - 1)^2 (a^2 + 4) = ?$

a) 2 b) 1 c) 0 d) 4



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36. If $\operatorname{Cosec}\theta - \sin\theta = 1$ & $\sec\theta - \cos\theta = m$, then $1^2m^2(1^2+m^2+3) = ?$

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

37. If $\cos\theta + \sin\theta = m$, $\sec\theta + \operatorname{cosec}\theta = n$, then $n(m^2-1)$ is equal to?

- a) $2m$ b) mn c) $4mn$ d) $2n$

38. $a(\tan\theta + \cot\theta) = 1$, $\sin\theta + \cos\theta = b$ and $0 < \theta < 90^\circ$, then relation between a and b ?

- a) $b^2 = 2(a+1)$ b) $b^2 = 2(a-1)$ c) $2a = b^2 - 1$ d) $2a = b^2 + 1$

39. If $x\sin^3\theta + y\cos^3\theta = \sin\theta\cos\theta$ & $x\sin\theta - y\cos\theta = 0$ for every $\theta \in (0, \frac{\pi}{2})$, then what is $x^2 + y^2$ equal to?

यदि $x\sin^3\theta + y\cos^3\theta = \sin\theta\cos\theta$ & $x\sin\theta - y\cos\theta = 0$ प्रत्येक $\theta \in (0, \pi/2)$ के लिए, तो $x^2 + y^2$ किसके बराबर है? (CDS 2023)

- A) 0
B) 1
C) 2
D) 3

40. If $2y\cos\theta = x\sin\theta$ and $2x\sec\theta - y\operatorname{cosec}\theta = 3$, then $x^2 + 4y^2 = ?$

- a) 1 b) 2 c) 0 d) 4

41. If $\cos^2\theta - \sin^2\theta = \tan^2\phi$, then which of the following is true?

यदि $\cos^2\theta - \sin^2\theta = \tan^2\phi$ है, तो निम्नलिखित में से कौन सा विकल्प सही है?

- (a) $\cos\theta \cos\phi = 1$ (b) $\cos^2\phi - \sin^2\phi = \tan^2\theta$
(c) $\cos^2\phi - \sin^2\phi = \cot^2\theta$ (d) $\cos\theta \cos\phi = \sqrt{2}$

42. If $\tan A + \sin A = p$ and $\tan A - \sin A = q$, then which of the following is true?

- a) $p^2 + q^2 = 4\sqrt{pq}$ b) $p+q=pq$ c) $p-q=pq$ d) $p^2 - q^2 = 4\sqrt{pq}$

43. If $a = \cot A + \cos A$ & $b = \cot A - \cos A$, then find the value of

$$a^2 - b^2 - 4\sqrt{ab}?$$

यदि $a = \cot A + \cos A$ और $b = \cot A - \cos A$, तो $a^2 - b^2 - 4\sqrt{ab}$ का मान ज्ञात कीजिए?

- A) 0
B) -1
C) 1
D) -4