



Maths By Gagan Pratap

# Trigonometry Sheet-1

## BASIC SHEET

Maths Special Batch

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1. If  $\sin B = \frac{9}{41}$ , then what is the value of  $\cot B$ , where  $0^\circ < B < 90^\circ$  ?

यदि  $\sin B = \frac{9}{41}$  है, तो  $\cot B$  का मान क्या होगा, जहाँ  $0^\circ < B < 90^\circ$  है?

- (a)  $\frac{41}{9}$   
 (b)  $\frac{40}{9}$   
 (c)  $\frac{9}{41}$   
 (d)  $\frac{9}{40}$

2. If  $\cos \theta = 9/13$ , then what is the value of  $\operatorname{cosec} \theta$  ?

- (a)  $\frac{13}{\sqrt{22}}$   
 (b)  $\frac{13\sqrt{22}}{44}$   
 (c)  $\frac{2\sqrt{22}}{13}$   
 (d)  $\frac{\sqrt{22}}{13}$

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3. If  $\theta$  is an acute angle and  $\sin \theta = \frac{43}{47}$ , what is the value of  $\cos \theta$ ?

यदि  $\theta$  एक न्यूनकोण है और  $\sin \theta = \frac{43}{47}$ , तो  $\cos \theta$  का मान क्या है?

- (a)  $\frac{43}{6\sqrt{10}}$  (b)  $\frac{47}{6\sqrt{10}}$  (c)  $\frac{6\sqrt{10}}{43}$  (d)  $\frac{6\sqrt{10}}{47}$

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4. If  $5\cos\theta=4\sin\theta, 0^\circ \leq \theta \leq 90^\circ$ , then what will be the value of  $\sec\theta$ .

यदि  $5\cos\theta=4\sin\theta, 0^\circ \leq \theta \leq 90^\circ$  है, तो  $\sec\theta$  का मान ज्ञात करें।

- (a)  $\frac{\sqrt{41}}{5}$   
 (b)  $\frac{3}{5}$   
 (c)  $\frac{\sqrt{41}}{16}$   
 (d)  $\frac{\sqrt{41}}{4}$

5. If  $\sin A = \frac{8}{17}$ , then what is the value of

**Cot A + Sec A?**

यदि  $\sin A = \frac{8}{17}$  है, तो  $\cot A + \sec A$  का मान क्या है?

- (a)  $4\frac{1}{120}$   
 (b)  $2\frac{1}{120}$



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(c)  $5\frac{1}{120}$

(d)  $3\frac{1}{120}$

6. If  $\tan\theta = \frac{8}{15}$ , then the value of  $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}$  is:

यदि  $\tan\theta = \frac{8}{15}$ , तो  $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}$  का मान क्या है?

(a)  $\frac{1}{5}$

(b)  $\frac{3}{5}$

(c)  $\frac{2}{5}$

(d)  $\frac{4}{5}$

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7. If  $4\cot A = 5$ , then what is the value of  $6 \sec A \tan A$ ?

यदि  $4\cot A = 5$ , तो  $6 \sec A \tan A$  का मान क्या है?

(a)  $\frac{20\sqrt{41}}{21}$

(b)  $\frac{25\sqrt{41}}{24}$

(c)  $\frac{24\sqrt{41}}{25}$

(d)  $3/2$

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8. If  $\cos\theta = \frac{7}{3\sqrt{6}}$  and  $\theta$  is an acute angle, then the value of  $27 \sin^2\theta - \frac{3}{2}$  is:

यदि  $\cos\theta = \frac{7}{3\sqrt{6}}$  है और  $\theta$  न्यून कोण है, तो  $27 \sin^2\theta - \frac{3}{2}$  का मान ज्ञात करें।

(a) 12

(b) 15

(c) 1

(d) 9

9. If  $\operatorname{cosec} A = 10$ , then what is the value of  $20 \sin A + 9\sqrt{11} \sec A$ ?

यदि  $\operatorname{cosec} A = 10$  है, तो  $20 \sin A + 9\sqrt{11} \sec A$  का मान ज्ञात करें।

Given that A is an acute angle.

दिया गया है कि, A न्यून कोण है।

(a) 23

(b) 34

(c) 32

(d) 30

10.

If  $\sin A = \frac{2}{3}$ , then find the value of  $(7 - \tan A)(3 + \cos A)$ .

यदि  $\sin A = \frac{2}{3}$  है तो,  $(7 - \tan A)(3 + \cos A)$  का मान ज्ञात कीजिए।

(a)  $\frac{61}{3} + \frac{17}{\sqrt{5}}$

(b)  $\frac{61}{3} - \frac{17}{3\sqrt{5}}$

(c)  $\frac{61}{3} + \frac{17}{3\sqrt{5}}$  (d)  $\frac{61}{3\sqrt{5}} + \frac{17}{3}$

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11.

If  $\sin\theta = \frac{5}{6}$ , the value of  $\cot\theta \cdot \sin\theta \cdot \cos\theta$  is \_\_\_\_\_.यदि  $\sin\theta = \frac{5}{6}$ , तो  $\cot\theta \cdot \sin\theta \cdot \cos\theta$  का मान ..... है।

(a)  $\frac{6}{5}$

(b)  $\frac{25}{36}$

(c)  $\frac{5}{6}$

(d)  $\frac{11}{36}$

**SSC CHSL 2023 PRE**12. If  $6 \sec\theta = 10$ , then find the value of  $(5 \operatorname{cosec}\theta - 3 \cot\theta)/(4 \cos\theta + 3 \sin\theta)$ .यदि  $6 \sec\theta = 10$  है, तो  $(5 \operatorname{cosec}\theta - 3 \cot\theta)/(4 \cos\theta + 3 \sin\theta)$  का मान ज्ञात कीजिए।

(a)  $\frac{2}{3}$

(b)  $\frac{3}{2}$

(c)  $\frac{5}{6}$

(d)  $\frac{6}{5}$

**SSC CHSL TIER - I 2022**13. If  $\operatorname{cosec}\theta = 1.25$ , then  $\frac{4\tan\theta - 5\cos\theta + 1}{\sec\theta + 4\cot\theta - 1} = ?$ यदि  $\operatorname{cosec}\theta = 1.25$  है, तो  $\frac{4\tan\theta - 5\cos\theta + 1}{\sec\theta + 4\cot\theta - 1} = ?$ 

(a) 2

(b)  $\frac{10}{11}$

(c)  $\frac{9}{10}$

(d)  $\frac{1}{2}$

14. If  $\cos\theta = \frac{12}{13}$ , then the value of  $\frac{\sin\theta(1-\tan\theta)}{\tan\theta(1+\operatorname{cosec}\theta)}$  is:यदि  $\cos\theta = \frac{12}{13}$  है तो  $\frac{\sin\theta(1-\tan\theta)}{\tan\theta(1+\operatorname{cosec}\theta)}$  का मान क्या होगा?

(a)  $\frac{25}{78}$

(b)  $\frac{35}{234}$

(c)  $\frac{35}{108}$

(d)  $\frac{25}{156}$

15. If  $\cot\theta = \frac{15}{8}$ ,  $\theta$  is an acute angle, then find the value of  $\frac{(1-\cos\theta)(2+2\cos\theta)}{(2-2\sin\theta)(1+\sin\theta)}$ .यदि  $\cot\theta = \frac{15}{8}$  है,  $\theta$  न्यून कोण है, तो  $\frac{(1-\cos\theta)(2+2\cos\theta)}{(2-2\sin\theta)(1+\sin\theta)}$  का मान ज्ञात करें।

(a)  $\frac{16}{15}$

(b)  $\frac{64}{225}$

(c)  $\frac{225}{64}$

(d)  $\frac{8}{15}$

16. If  $\sec\left(90^\circ - \frac{3\theta}{2}\right) = \sqrt{2}$ ,  $0^\circ < \theta < 90^\circ$ , then the value of  $2 \sin\theta + 4 \cos 2\theta$  will be :यदि  $\sec\left(90^\circ - \frac{3\theta}{2}\right) = \sqrt{2}$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $2 \sin\theta + 4 \cos 2\theta$  का मान ज्ञात करें।

(a) 4

(b) 2

(c) 3



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(d)

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17. If  $\operatorname{cosec} \theta = 1 \frac{7}{22}$ , find the value of  $\cot^2 \theta$ .

यदि  $\operatorname{cosec} \theta = 1 \frac{7}{22}$ , तो  $\cot^2 \theta$  का मान ज्ञात कीजिए।

(a)  $\frac{357}{484}$

(b)  $\frac{49}{484}$

(c)  $\frac{225}{484}$

(d)  $\frac{7}{22}$

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18. If  $\tan \theta = \frac{8}{19}$ , find the value of  $\sec^2 \theta$ .

यदि  $\tan \theta = \frac{8}{19}$ , तो  $\sec^2 \theta$  का मान ज्ञात कीजिए।

(a)  $\frac{297}{361}$

(b)  $\frac{11}{19}$

(c)  $1 \frac{8}{19}$

(d)  $1 \frac{64}{361}$

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19. If  $\sec \theta = 2 \frac{4}{23}$ , find the value of  $\tan^2 \theta$ .

यदि  $\sec \theta = 2 \frac{4}{23}$ , तो  $\tan^2 \theta$  का मान ज्ञात कीजिए।

(a)  $3 \frac{177}{529}$

(b)  $2 \frac{16}{529}$

(c)  $1 \frac{200}{529}$

(d)  $3 \frac{384}{529}$

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20. If  $\tan A = \frac{2}{5}$ , then find  $\frac{\sec^2 A}{\operatorname{cosec}^2 A}$ ?

यदि  $\tan A = \frac{2}{5}$ , तो  $\frac{\sec^2 A}{\operatorname{cosec}^2 A}$  ज्ञात कीजिए? (CPO 2023)

a)  $3/5$

b)  $4/25$

c)  $2/5$

d)  $9/25$

21. If  $\cos A = \frac{\sqrt{10}}{\sqrt{15}}$ , then the value of  $\frac{\operatorname{cosec}^2 A + \tan^2 A}{\sin^2 A + \cot^2 A}$  is:

अगर  $\cos A = \frac{\sqrt{10}}{\sqrt{15}}$  है, तो  $\frac{\operatorname{cosec}^2 A + \tan^2 A}{\sin^2 A + \cot^2 A}$  का मान ज्ञात कीजिए।

(a)  $\frac{9}{4}$

(b)  $\frac{4}{9}$

(c)  $\frac{3}{2}$

(d)  $\frac{2}{3}$

22. IF  $\cos A = \frac{63}{65}$ , then find the value of  $\tan A + \cot A$  (up to two places of decimal).

यदि  $\cos A = \frac{63}{65}$ , तो  $\tan A + \cot A$  का मान ज्ञात कीजिए (दो स्थानों तक)।

(a) 3.19

(b) 5.23

(c) 4.19

(d) 2.76

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23. If  $\cot \theta = \sqrt{2} + 1$ , then  $\operatorname{cosec} \theta \sec \theta = ?$

यदि  $\cot \theta = \sqrt{2} + 1$  है, तो  $\operatorname{cosec} \theta \sec \theta$  का मान ज्ञात करें।



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

24. If  $\cos\theta - \sin\theta = 0$ , then  $(\sin^8\theta + \cos^8\theta)$  is:

यदि  $\cos\theta - \sin\theta = 0$  है, तो  $(\sin^8\theta + \cos^8\theta)$  होगा।

- (a)  $\frac{1}{8}$  (b)  $\frac{1}{6}$  (c)  $\frac{1}{2}$  (d)  $\frac{1}{4}$

25. If  $\sin\theta + \cos\theta = \sqrt{2}$ , then find the value of  $\operatorname{cosec}\theta + \cot\theta$ .

यदि  $\sin\theta + \cos\theta = \sqrt{2}$  है, तो  $\operatorname{cosec}\theta + \cot\theta$  का मान ज्ञात कीजिए।

- (a)  $\sqrt{2} - 1$
- (b)  $\sqrt{2} + 5$
- (c)  $\sqrt{3} - 1$
- (d)  $\sqrt{2} + 1$

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26. If  $(\cos\theta + \sin\theta) : (\cos\theta - \sin\theta) = (\sqrt{3} + 1) : (\sqrt{3} - 1)$ ,  $0 < \theta < 90^\circ$ , then what is the value of  $\sec\theta$ ?

यदि  $(\cos\theta + \sin\theta) : (\cos\theta - \sin\theta) = (\sqrt{3} + 1) : (\sqrt{3} - 1)$ ,  $0 < \theta < 90^\circ$  है, तो  $\sec\theta$  का मान क्या होगा?

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

27. If  $\sin\theta = \sqrt{3} \cos\theta$ , then what is the value of  $\frac{3\sin^2\theta + \cos^2\theta}{2\cos\theta + 5}$ ?

यदि  $\sin\theta = \sqrt{3} \cos\theta$ , तो  $\frac{3\sin^2\theta + \cos^2\theta}{2\cos\theta + 5}$  का मान क्या है?

- (a) 19/25
- (b) 18/5
- (c) 11/24
- (d) 3/2

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28. If  $3\tan\theta = 2\sqrt{3} \sin\theta$ ,  $0^\circ < \theta < 90^\circ$ , then the value of  $\frac{3}{4} \left( \frac{\operatorname{cosec}^2 2\theta + \cot^2 2\theta}{\sin^2 \theta + \tan^2 2\theta} \right)$

यदि  $3\tan\theta = 2\sqrt{3} \sin\theta$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $\frac{3}{4} \left( \frac{\operatorname{cosec}^2 2\theta + \cot^2 2\theta}{\sin^2 \theta + \tan^2 2\theta} \right)$  का मान ज्ञात करें।

- (a)  $\frac{5}{13}$
- (b)  $\frac{3}{13}$
- (c)  $\frac{7}{13}$
- (d)  $\frac{1}{13}$

29. If  $A = 22.5^\circ$ , then what is the value of  $10\sqrt{2}\sin 2A - 7\sqrt{2}\cos 2A + 9 \tan 2A$ ?

यदि  $A = 22.5^\circ$  है, तो  $10\sqrt{2}\sin 2A - 7\sqrt{2}\cos 2A + 9 \tan 2A$  का मान क्या है?



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- A) 12  
B) 15  
C) 10  
D) 6

30. If  $\sin \theta = \frac{a}{\sqrt{a^2+b^2}}$ ,  $0^\circ < \theta < 90^\circ$ , then the value of  $\sec \theta + \tan \theta$  is:

यदि  $\sin \theta = \frac{a}{\sqrt{a^2+b^2}}$ ,  $0^\circ < \theta < 90^\circ$ , तो  $\sec \theta + \tan \theta$  का मान है—

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

31. If  $\cos \theta = \frac{4x}{1+4x^2}$  then what is the value of  $\sin \theta$ ?

यदि  $\cos \theta = \frac{4x}{1+4x^2}$  तो  $\sin \theta$  का मान क्या होगा?

- (a)  $\frac{1+4x^2}{1-4x^2}$   
(b)  $\frac{1+4x^2}{4x^2}$   
(c)  $\frac{1-4x^2}{1+4x^2}$   
(d)  $\frac{1-4x^2}{4x}$

32. If  $\sin \theta = \frac{2\sqrt{ab}}{a+b}$ ,  $a > b > 0$ , then the value of  $\frac{\cos \theta + 1}{\cos \theta - 1}$  will be:

यदि  $\sin \theta = \frac{2\sqrt{ab}}{a+b}$  है,  $a > b > 0$  है, तो  $\frac{\cos \theta + 1}{\cos \theta - 1}$  का मान ज्ञात करें।

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

33. If  $b \sin \theta = a$ , then  $\sec \theta + \tan \theta = ?$

यदि  $b \sin \theta = a$  है, तो  $\sec \theta + \tan \theta = ?$

- (a)  $\sqrt{\frac{b+a}{b-a}}$



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(b)  $\sqrt{\frac{1}{b+a}}$

(c)  $\sqrt{\frac{1}{b-a}}$

(d)  $\sqrt{\frac{b-a}{b+a}}$

(SSC CGL 2022)

34. If  $\operatorname{cosec} \theta = b/a$ , then  $\frac{\sqrt{3}\cot\theta+1}{\tan\theta+\sqrt{3}}$  is equal to:

यदि  $\operatorname{cosec} \theta = b/a$  है, तो  $\frac{\sqrt{3}\cot\theta+1}{\tan\theta+\sqrt{3}}$  के बराबर है।

(a)  $\frac{\sqrt{b^2-a^2}}{a}$

(b)  $\frac{\sqrt{b^2+a^2}}{a}$

(c)  $\frac{\sqrt{a^2+b^2}}{b}$

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

35. The value of which of the following is different from the other options?

निम्नलिखित में से किसका मान अन्य विकल्पों से भिन्न है?

1.  $\sin 90^\circ$

2.  $\sec 60^\circ$

3.  $\cos 0^\circ$

4.  $\tan 45^\circ$

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36. In  $\triangle ABC$ ,  $\angle C=90^\circ$  and  $AB=c$ ,  $BC=a$ ,  $CA=b$ , then find the value of  $(\operatorname{cosec} B - \cos A)$ ?

a)  $\frac{c^2}{ab}$

b)  $\frac{b^2}{ca}$

c)  $\frac{a^2}{bc}$

d)  $\frac{bc}{a^2}$

37. In  $\triangle ABC$ ,  $AB = 20$  cm,  $BC = 21$  cm and  $AC = 29$  cm. What is the value of  $\cot C + \operatorname{cosec} C - 2 \tan A$ ?

$\triangle ABC$  में,  $AB = 20$  cm,  $BC = 21$  cm और  $AC = 29$  cm है।  $\cot C + \operatorname{cosec} C - 2 \tan A$  का मान ज्ञात करें।

(a)  $\frac{9}{20}$

(b)  $\frac{7}{20}$

(c)  $\frac{2}{5}$

(d)  $\frac{3}{5}$

38. If  $\sqrt{13} \sin \theta = 2$ , then the value of  $\frac{3 \tan \theta + \sqrt{13} \sin \theta}{\sqrt{13} \cos \theta - 3 \tan \theta}$  is:

यदि  $\sqrt{13} \sin \theta = 2$  है, तो  $\frac{3 \tan \theta + \sqrt{13} \sin \theta}{\sqrt{13} \cos \theta - 3 \tan \theta}$  का मान क्या होगा?

(a) 5

(b) 4

(c) 3

(d)  $\frac{1}{2}$

39. If  $\tan x = 7/5$ , then the value of  $\frac{9 \sin x - \frac{42}{5} \cos x}{15 \sin x + 21 \cos x}$  is?

यदि  $\tan x = 7/5$  है, तो  $\frac{9 \sin x - \frac{42}{5} \cos x}{15 \sin x + 21 \cos x}$  का मान क्या है?

A) 0



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- B) 0.1  
C) 1  
D) 0.5

40. If  $\sec\theta = \frac{a}{b}$ ,  $b \neq 0$ , then  $\frac{1-\tan^2\theta}{2-\sin^2\theta} = ?$

यदि  $\sec\theta = \frac{a}{b}$ ,  $b \neq 0$  है, तो  $\frac{1-\tan^2\theta}{2-\sin^2\theta} = ?$

- (a)  $\frac{a^2(2b^2+a^2)}{b^2(a^2-b^2)}$  (b)  $\frac{a^2(2b^2+a^2)}{b^2(a^2+b^2)}$   
(c)  $\frac{a^2(2b^2-a^2)}{b^2(a^2+b^2)}$  (d)  $\frac{b^2(2b^2-a^2)}{a^2(a^2+b^2)}$

41. If  $\sin\theta = \sqrt{\frac{1}{6} \sqrt{\frac{1}{6} \sqrt{\frac{1}{6}}}}$  -----  $\infty$  Then,  $\tan\theta + \cot\theta = ?$

- a)  $\frac{36}{\sqrt{35}}$  b)  $\frac{36}{35}$  c)  $\frac{\sqrt{35}}{36}$  d)  $\sqrt{\frac{35}{36}}$

42.  $\sin\theta = \frac{8}{17}$ ,  $\tan\alpha = \frac{15}{8}$ , then find  $\cos(\theta+\alpha) = ?$

- a) 0 b) 1 c)  $\frac{23}{17}$  d)  $\frac{15}{17}$

43. If  $4\sin^2(2x-10)^\circ = 3$ ,  $0 \leq (2x-10) \leq 90$ , then find the value of  $\frac{\sin^4(x-5)^\circ + \cos^4(x-5)^\circ}{1-2\sin^2(3x-15)^\circ \cos^2(3x-15)^\circ}$ .

यदि  $4\sin^2(2x-10)^\circ = 3$ ,  $0 \leq (2x-10) \leq 90$  है, तो  $\frac{\sin^4(x-5)^\circ + \cos^4(x-5)^\circ}{1-2\sin^2(3x-15)^\circ \cos^2(3x-15)^\circ}$  का मान ज्ञात करें।

- (a) 1  
(b)  $\frac{5}{8}$   
(c)  $-\frac{5}{8}$   
(d) -1

44. If  $5\sin\theta - 4\cos\theta = 0$ ,  $0^\circ < \theta < 90^\circ$ , then the value of  $\frac{5\sin\theta - 2\cos\theta}{5\sin\theta + 3\cos\theta}$  is:

यदि  $5\sin\theta - 4\cos\theta = 0$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $\frac{5\sin\theta - 2\cos\theta}{5\sin\theta + 3\cos\theta}$  का मान है:

- a)  $\frac{3}{7}$  b)  $\frac{2}{7}$  c)  $\frac{5}{8}$  d)  $\frac{3}{8}$

45. If  $\tan\theta = \frac{5}{9}$ , then  $\frac{18\sin\theta - 7\cos\theta}{9\sin\theta + 11\cos\theta}$  is equal to:

यदि  $\tan\theta = \frac{5}{9}$ , हो तो  $\frac{18\sin\theta - 7\cos\theta}{9\sin\theta + 11\cos\theta}$  का मान होगा?

- a)  $\frac{5}{14}$  b)  $\frac{3}{16}$  c)  $\frac{2}{5}$  d)  $\frac{4}{11}$

46. If  $\cot\theta = \sqrt{6}$ , then the value of  $\frac{\operatorname{cosec}^2\theta + \sec^2\theta}{\operatorname{cosec}^2\theta - \sec^2\theta}$  is:

यदि  $\cot\theta = \sqrt{6}$  है तो  $\frac{\operatorname{cosec}^2\theta + \sec^2\theta}{\operatorname{cosec}^2\theta - \sec^2\theta}$  का मान :

- a)  $\frac{49}{36}$  b)  $\frac{43}{36}$  c)  $\frac{7}{5}$  d)  $\frac{48}{35}$

47. If  $\tan\theta = \frac{2}{\sqrt{13}}$ , then the value of  $\frac{3\operatorname{cosec}^2\theta + 2\sec^2\theta}{5\operatorname{cosec}^2\theta - 4\sec^2\theta}$  will be:

यदि  $\tan\theta = \frac{2}{\sqrt{13}}$ , तो  $\frac{3\operatorname{cosec}^2\theta + 2\sec^2\theta}{5\operatorname{cosec}^2\theta - 4\sec^2\theta}$  का मान होगा:

- (a)  $\frac{41}{45}$  (b)  $\frac{47}{49}$





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(c)  $\frac{46}{53}$

(d)  $\frac{5}{7}$

48. If  $\frac{\sin\theta - \cos\theta}{\sin\theta + \cos\theta} = \frac{4}{5}$ , then find  $\frac{\operatorname{cosec}^2\theta}{2 - \operatorname{cosec}^2\theta}$ ?

यदि  $\frac{\sin\theta - \cos\theta}{\sin\theta + \cos\theta} = \frac{4}{5}$ , तो  $\frac{\operatorname{cosec}^2\theta}{2 - \operatorname{cosec}^2\theta}$  ज्ञात कीजिए?

- A) 16/25  
B) 40/41  
C) 41/40  
D) 31/30

49. If  $\frac{\operatorname{cosec}\theta + \cot\theta}{\operatorname{cosec}\theta - \cot\theta} = 7$ , then the value of  $\frac{4\sin^2\theta + 5}{4\sin^2\theta - 1}$  is:

यदि  $\frac{\operatorname{cosec}\theta + \cot\theta}{\operatorname{cosec}\theta - \cot\theta} = 7$  है, तो  $\frac{4\sin^2\theta + 5}{4\sin^2\theta - 1}$  का मान ज्ञात करें।

- (a) 15  
(b) 3  
(c) 9  
(d) 12

50. If  $\frac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta} = 2\frac{51}{79}$  then the value of  $\sin\theta$  is equal to:

यदि  $\frac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta} = 2\frac{51}{79}$  है, तो  $\sin\theta$  का मान ज्ञात कीजिए।

- (a)  $\frac{65}{144}$   
(b)  $\frac{35}{72}$   
(c)  $\frac{91}{144}$   
(d)  $\frac{39}{72}$

51. If  $\frac{\sec\theta - \tan\theta}{\sec\theta + \tan\theta} = \frac{3}{5}$ , then the value of  $\frac{\operatorname{cosec}\theta + \cot\theta}{\operatorname{cosec}\theta - \cot\theta}$  is: -

यदि  $\frac{\sec\theta - \tan\theta}{\sec\theta + \tan\theta} = \frac{3}{5}$  है, तो  $\frac{\operatorname{cosec}\theta + \cot\theta}{\operatorname{cosec}\theta - \cot\theta}$  का मान बताइए।

- a)  $31 + 8\sqrt{15}$   
b)  $33 + 4\sqrt{15}$   
c)  $27 + \sqrt{15}$   
d)  $24 + \sqrt{15}$

52. The given expression is equal to:  $\frac{\sin^4 A + \cos^4 A}{1 - 2\sin^2 A \cos^2 A}$

दिया गया व्यंजक  $\frac{\sin^4 A + \cos^4 A}{1 - 2\sin^2 A \cos^2 A}$  के बराबर है।

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

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53. If  $\sin\theta \cos\theta = \frac{1}{\sqrt{5}}$  then the value of  $(\sin^4\theta + \cos^4\theta)$

यदि  $\sin\theta \cos\theta = \frac{1}{\sqrt{5}}$  है, तो  $(\sin^4\theta + \cos^4\theta)$  का मान क्या है?

- (a)  $\frac{5}{3}$   
(b) 1  
(c) 0.6  
(d) 0.4

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54. If  $\sin\theta \cos\theta = \frac{\sqrt{2}}{3}$ , then the value of  $(\sin^6\theta + \cos^6\theta)$

यदि  $\sin\theta \cos\theta = \frac{\sqrt{2}}{3}$ , तो  $(\sin^6\theta + \cos^6\theta)$  का मान क्या है?

- (a)  $\frac{1}{3}$   
(b)  $\frac{2}{3}$   
(c)  $\frac{5}{3}$   
(d)  $\frac{4}{3}$

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## BASIC SHEET

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55. If  $\sin\theta + \cos\theta = \frac{\sqrt{7}}{2}$ , then what is  $\sin^6\theta + \cos^6\theta + 6\sin^2\theta\cos^2\theta$  equal to?

यदि  $\sin\theta + \cos\theta = \frac{\sqrt{7}}{2}$  है तो  $\sin^6\theta + \cos^6\theta + 6\sin^2\theta\cos^2\theta$  किसके बराबर है?

- (a)  $\frac{21}{16}$  (b)  $\frac{103}{64}$  (c) 1 (d)  $\frac{91}{64}$

56. In a triangle ABC, right angled at B, AB= 7 and (AC-BC)= 1cm. The value of (secA+cotC) is:

ΔABC में B पर समकोण है, AB=7cm और (AC-BC)=1cm है। (secA+cotC) का मान है:

- a)  $\frac{4}{3}$  b)  $\frac{3}{4}$  c)  $\frac{175}{24}$  d) 7

57. In a right ΔABC, ∠B=90°, AC-BC=2, AB=4√2, Then secA+cotC?

- a) 2√2 b) 4√2 c) 3√2 d) 5√2

58. If  $\sec x + \cos x = 3$ , then  $\tan^2 x - \sin^2 x = ?$

- a) 5 b) 13 c) 9 d) 4

59. If  $\sin\theta + \operatorname{cosec}\theta = k$ , then what is the value of  $\cos^2\theta - \cot^2\theta$ ?

यदि  $\sin\theta + \operatorname{cosec}\theta = k$  है तो  $\cos^2\theta - \cot^2\theta$  का मान क्या है?

- (a)  $3 - k^2$  (b)  $4 - k^2$  (c)  $k^2 - 4$  (d)  $k^2 + 2$

60. If  $\sin\theta + \operatorname{cosec}\theta = 7$ , then what is the value of  $\sin^3\theta + \operatorname{cosec}^3\theta$ ?

यदि  $\sin\theta + \operatorname{cosec}\theta = 7$  है, तो  $\sin^3\theta + \operatorname{cosec}^3\theta$  का मान ज्ञात कीजिए।

- (a) 350  
(b) 382  
(c) 322  
(d) 367

61. If  $\cos\theta + \sec\theta = \sqrt{3}$ , then the value of  $\cos^3\theta + \sec^3\theta$  is:

यदि  $\cos\theta + \sec\theta = \sqrt{3}$ , तो  $\cos^3\theta + \sec^3\theta$  का मान ज्ञात कीजिए।

- (a)  $\frac{1}{\sqrt{3}}$  (b)  $2\sqrt{3}$  (c) 0 (d)  $\sqrt{3}$

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62. What is the simplified value of  $\frac{\cot A + \tan B}{\cot B + \tan A} = ?$

- a)  $\tan B \cot A$  b)  $\tan A \cot B$   
c)  $\tan A \tan B$  d)  $\cot A \cot B$

63. If  $7\sin^2\theta + 4\cos^2\theta = 5$  and  $\theta$  lies in the first quadrant, then what is the value of  $\frac{\sqrt{3}\sec\theta + \tan\theta}{\sqrt{2}\cot\theta - \sqrt{3}\cos\theta}$ ?

यदि  $7\sin^2\theta + 4\cos^2\theta = 5$  और  $\theta$  पहले चतुर्थांश में स्थित है, तो  $\frac{\sqrt{3}\sec\theta + \tan\theta}{\sqrt{2}\cot\theta - \sqrt{3}\cos\theta}$  का मान क्या है?

- (a)  $2(1 + \sqrt{2})$  (b)  $3\sqrt{2}$  (c)  $2(\sqrt{2} - 1)$  (d)  $4\sqrt{2}$

64. If  $\frac{\sin^2\theta}{\tan^2\theta - \sin^2\theta} = 5$ ,  $\theta$  is an acute angle, then the value of  $\frac{24\sin^2\theta - 15\sec^2\theta}{6\operatorname{cosec}^2\theta - 7\cot^2\theta}$  is:

यदि  $\frac{\sin^2\theta}{\tan^2\theta - \sin^2\theta} = 5$  है,  $\theta$  न्यून कोण है, तो  $\frac{24\sin^2\theta - 15\sec^2\theta}{6\operatorname{cosec}^2\theta - 7\cot^2\theta}$  का मान ज्ञात करें।

- (a) 2  
(b) -14  
(c) 14  
(d) -2



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65. If  $\frac{\cos^2\theta}{\cot^2\theta + \sin^2\theta - 1} = 3$ ,  $0^\circ < \theta < 90^\circ$ , then the value of  $(\tan \theta + \operatorname{cosec} \theta)$  is:

यदि  $\frac{\cos^2\theta}{\cot^2\theta + \sin^2\theta - 1} = 3$  है,  $0^\circ < \theta < 90^\circ$  है, तो  $(\tan \theta + \operatorname{cosec} \theta)$  का मान ज्ञात करें।

(a)  $2\sqrt{3}$

(b)  $\frac{5\sqrt{3}}{3}$

(c)  $3\sqrt{3}$

(d)  $\frac{4\sqrt{3}}{3}$

66. If  $3\cos\theta = 2\sin^2\theta$ ,  $0^\circ < \theta < 90^\circ$ , then what is the value of  $(\tan^2\theta + \sec^2\theta - \operatorname{cosec}^2\theta)$

यदि  $3\cos\theta = 2\sin^2\theta$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $(\tan^2\theta + \sec^2\theta - \operatorname{cosec}^2\theta)$  का मान ज्ञात करें।

(a)  $\frac{17}{3}$

(b)  $-\frac{7}{3}$

(c)  $-\frac{17}{3}$

(d)  $\frac{7}{3}$

67. If  $5\sin^2\theta = 3(1 + \cos\theta)$ ,  $0^\circ < \theta < 90^\circ$ , then the value of  $\operatorname{cosec}\theta + \cot\theta$  is:

यदि  $5\sin^2\theta = 3(1 + \cos\theta)$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $\operatorname{cosec}\theta + \cot\theta$  का मान ज्ञात करें।

(a)  $\sqrt{\frac{7}{3}}$

(b)  $\frac{5}{\sqrt{21}}$

(c)  $\frac{4}{\sqrt{21}}$

(d)  $\sqrt{\frac{3}{7}}$

68. Solve the following equation/निम्न समीकरण का मान ज्ञात करें।

$\theta : 2\sqrt{3} \sin^2\theta + \cos\theta - \sqrt{3} = 0$  where  $\theta$  is an acute angle /जहाँ  $\theta$  न्यून कोण है।

(a)  $30^\circ$

(b)  $45^\circ$

(c)  $60^\circ$

(d)  $15^\circ$



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69. If  $5 \sin^2 \theta + 14 \cos \theta = 13$ ,  $0^\circ < \theta < 90^\circ$ , then what is the value of  $\frac{\sec \theta + \cot \theta}{\operatorname{cosec} \theta + \tan \theta}$ ?

यदि  $5 \sin^2 \theta + 14 \cos \theta = 13$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $\frac{\sec \theta + \cot \theta}{\operatorname{cosec} \theta + \tan \theta}$  का मान क्या होगा?

- a)  $\frac{9}{8}$       b)  $\frac{31}{29}$       c)  $\frac{21}{28}$       d)  $\frac{32}{27}$

70. If  $2 \sin \theta + 15 \cos^2 \theta = 7$ ,  $0^\circ < \theta < 90^\circ$ , then  $\tan \theta + \cos \theta + \sec \theta = ?$

यदि  $2 \sin \theta + 15 \cos^2 \theta = 7$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $\tan \theta + \cos \theta + \sec \theta$  का मान ज्ञात कीजिए।

- a)  $3\frac{4}{5}$       b) 3      c)  $3\frac{3}{5}$       d) 4

71. If  $7 \sin^2 \theta - \cos^2 \theta + 2 \sin \theta = 2$ ,  $0^\circ < \theta < 90^\circ$ , then the value of  $\frac{\sec 2\theta + \cot 2\theta}{\operatorname{cosec} 2\theta + \tan 2\theta}$  is?

यदि  $7 \sin^2 \theta - \cos^2 \theta + 2 \sin \theta = 2$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $\frac{\sec 2\theta + \cot 2\theta}{\operatorname{cosec} 2\theta + \tan 2\theta}$  का मान क्या है?

- a)  $\frac{2\sqrt{3}+1}{3}$       b) 1      c)  $\frac{1(1+2\sqrt{3})}{5}$       d)  $\frac{2}{5}(1+\sqrt{3})$

72. If  $3 - 2 \sin^2 \theta - 3 \cos \theta = 0$ ,  $0^\circ \leq \theta \leq 90^\circ$ , then the value of  $(2 \operatorname{cosec} \theta + \tan \theta)$ :

यदि  $3 - 2 \sin^2 \theta - 3 \cos \theta = 0$ ,  $0^\circ \leq \theta \leq 90^\circ$  है तो  $(2 \operatorname{cosec} \theta + \tan \theta)$  का मान है:

- a)  $7\sqrt{3}$       b)  $5\sqrt{3}$       c)  $\frac{5\sqrt{3}}{3}$       d)  $\frac{7\sqrt{3}}{3}$

73. If  $\frac{\sin^2 \theta}{\cos^2 \theta - 3 \cos \theta + 2} = 1$ ,  $\theta$  lies in the first quadrant, then the value of  $\frac{\tan^2 \frac{\theta}{2} + \sin^2 \frac{\theta}{2}}{\tan \theta + \sin \theta}$  is

यदि  $\frac{\sin^2 \theta}{\cos^2 \theta - 3 \cos \theta + 2} = 1$ ,  $\theta$  पहले चतुर्थांश में है, तो  $\frac{\tan^2 \frac{\theta}{2} + \sin^2 \frac{\theta}{2}}{\tan \theta + \sin \theta}$  का मान है?

- (a)  $\frac{2\sqrt{3}}{27}$       (b)  $\frac{5\sqrt{3}}{27}$       (c)  $\frac{2\sqrt{3}}{9}$       (d)  $\frac{7\sqrt{3}}{54}$

74. If  $4 - 6 \cos^2 \theta - \sin \theta = 0$ ,  $0^\circ < \theta < 90^\circ$ , then the value of  $\cot \theta + \tan \theta$ :

यदि  $4 - 6 \cos^2 \theta - \sin \theta = 0$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $\cot \theta + \tan \theta$  का मान है:

- a)  $9\sqrt{2}/5$       b)  $9/2\sqrt{5}$       c)  $3\sqrt{2}/5$       d)  $3/2\sqrt{5}$

75. If  $8 \cos^2 \theta - 2 \cos \theta - 3 = 0$ ,  $0^\circ < \theta < 90^\circ$ , then what is the value of  $3 \tan \theta + \operatorname{cosec} \theta + \cot \theta$ ?

यदि  $8 \cos^2 \theta - 2 \cos \theta - 3 = 0$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $3 \tan \theta + \operatorname{cosec} \theta + \cot \theta$  का मान क्या है?

- (a)  $2\sqrt{7}$

- (b)  $\frac{4}{3}\sqrt{7}$

- (c)  $\frac{3}{4}\sqrt{7}$

- (d)  $4\sqrt{7}$

76. If  $11 \sin^2 \theta - \cos^2 \theta + 4 \sin \theta - 4 = 0$ ,  $0^\circ < \theta < 90^\circ$ , then what is the value of  $\frac{\cot 2\theta + \cos 2\theta}{\sec 2\theta - \tan 2\theta}$ ?

यदि  $11 \sin^2 \theta - \cos^2 \theta + 4 \sin \theta - 4 = 0$ ,  $0^\circ < \theta < 90^\circ$ , तो  $\frac{\cot 2\theta + \cos 2\theta}{\sec 2\theta - \tan 2\theta}$  का मान क्या है?

- a)  $\frac{12+7\sqrt{3}}{6}$       b)  $\frac{12+5\sqrt{3}}{3}$       c)  $\frac{10+5\sqrt{3}}{3}$       d)  $\frac{10+7\sqrt{3}}{6}$

77. If  $\theta$  is an acute angle and  $\sin \theta \cos \theta = 2 \cos^3 \theta - \frac{1}{4} \cos \theta$ , then the value of  $\sin \theta$  is?

यदि  $\theta$  एक न्यूनकोण है और  $\sin \theta \cos \theta = 2 \cos^3 \theta - \frac{1}{4} \cos \theta$  है, तो  $\sin \theta$  का मान क्या है?

- A)  $\frac{\sqrt{15}-1}{8}$

- B)  $\frac{\sqrt{15}+1}{4}$

- C)  $\frac{\sqrt{15}-1}{4}$

- D)  $\frac{\sqrt{15}-1}{2}$



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# Trigonometry Sheet-1

## BASIC SHEET

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78. If  $\frac{1}{1+\tan\theta} + \frac{1}{1-\tan\theta} = 4$ ,  $0^\circ < \theta < 90^\circ$ , then what is the value of  $\operatorname{cosec}\theta + \sec\theta + \sin\theta$  ?

यदि  $\frac{1}{1+\tan\theta} + \frac{1}{1-\tan\theta} = 4$ ,  $0^\circ < \theta < 90^\circ$ , तो  $\operatorname{cosec}\theta + \sec\theta + \sin\theta$  का मान क्या है?

(a)  $\frac{3+4\sqrt{2}}{\sqrt{6}}$

(b)  $\frac{8\sqrt{3}}{3}$

(c)  $\frac{3\sqrt{3}}{2}$

(d)  $\frac{4+3\sqrt{2}}{\sqrt{6}}$

79. If  $\tan^2\theta - 3\sec\theta + 3 = 0$ ,  $0^\circ < \theta < 90^\circ$ , then the value of  $\sin\theta + \cot\theta$  is:

यदि  $\tan^2\theta - 3\sec\theta + 3 = 0$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $\sin\theta + \cot\theta$  का मान होगा—

a)  $\frac{5\sqrt{3}}{6}$

b)  $2\sqrt{3}$

c)  $\frac{5\sqrt{3}}{3}$

d)  $3\sqrt{3}$

80. If  $\tan\theta - \cot\theta = \operatorname{cosec}\theta$ ,  $0^\circ < \theta < 90^\circ$ , then what is the value of  $\frac{2\tan\theta - \cos\theta}{\sqrt{3}\cot\theta + \sec\theta}$  ?

यदि  $\tan\theta - \cot\theta = \operatorname{cosec}\theta$ ,  $0^\circ < \theta < 90^\circ$ , तो  $\frac{2\tan\theta - \cos\theta}{\sqrt{3}\cot\theta + \sec\theta}$  का मान क्या है?

a)  $\frac{2(2\sqrt{3}-1)}{3}$

b)  $\frac{4\sqrt{3}-1}{6}$

c)  $\frac{3\sqrt{3}-1}{6}$

d)  $\frac{2\sqrt{3}-1}{6}$

81. For  $\theta : 0^\circ < \theta < 90^\circ$

$3 \sec \theta + 4 \cos \theta = 4\sqrt{3}$ , find the value of  $(1 - \sin \theta + \cos \theta)$ .

$\theta$  के लिए :  $0^\circ < \theta < 90^\circ$  है।

$3 \sec \theta + 4 \cos \theta = 4\sqrt{3}$  है, तो  $(1 - \sin \theta + \cos \theta)$  का मान ज्ञात करें।

(a)  $\frac{1+2\sqrt{3}}{2}$

(b)  $\frac{1+\sqrt{3}}{2}$

(c)  $\frac{1-\sqrt{3}}{2}$

(d)  $\frac{1-2\sqrt{3}}{2}$

82. Find the value of  $\theta$ , if  $\sec^2\theta + (1 - \sqrt{3}) \tan \theta - (1 + \sqrt{3}) = 0$ , where  $\theta$  is an acute angle.

$\theta$  का मान ज्ञात करें, यदि  $\sec^2\theta + (1 - \sqrt{3}) \tan \theta - (1 + \sqrt{3}) = 0$ , जहाँ  $\theta$  न्यून कोण है।

(a)  $60^\circ$

(b)  $30^\circ$

(c)  $45^\circ$

(d)  $15^\circ$

83. If  $12\cot^2\theta - 31\operatorname{cosec}\theta + 32 = 0$ ,  $0^\circ < \theta < 90^\circ$ , then the values of  $\sin\theta$  will be:

यदि  $12\cot^2\theta - 31\operatorname{cosec}\theta + 32 = 0$ ,  $0^\circ < \theta < 90^\circ$  है तो  $\sin\theta$  का मान होगा?



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## BASIC SHEET

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a)  $\frac{5}{4}, \frac{4}{3}$     b)  $\frac{2}{3}, \frac{1}{4}$     c)  $\frac{4}{5}, \frac{3}{4}$     d)  $\frac{1}{3}, \frac{3}{2}$

84. What is the value of  $\sin\theta + \cos\theta$ , if  $\theta$  satisfies the equation

$$\cot^2\theta - (\sqrt{3} + 1)\cot\theta + \sqrt{3} = 0; 0 < \theta < \frac{\pi}{4}$$

यदि  $\theta$  समीकरण  $\cot^2\theta - (\sqrt{3} + 1)\cot\theta + \sqrt{3} = 0; 0 < \theta < \frac{\pi}{4}$  को संतुष्ट करता है, तो  $\sin\theta + \cos\theta$  का मान क्या है? (CDS 2023)

- A)  $\sqrt{2}$   
B) 2  
C)  $\frac{\sqrt{3}+1}{2}$   
D)  $\frac{\sqrt{3}-1}{2}$

85. If  $6 \tan \theta - 5\sqrt{3} \sec \theta + 12 \cot \theta = 0, 0^\circ < \theta < 90^\circ$ , then the value of  $(\operatorname{cosec} \theta + \sec \theta)$  is

यदि  $6 \tan \theta - 5\sqrt{3} \sec \theta + 12 \cot \theta = 0, 0^\circ < \theta < 90^\circ$  है, तो  $(\operatorname{cosec} \theta + \sec \theta)$  का मान ज्ञात कीजिए।

- (A)  $\frac{3+2\sqrt{3}}{2}$     (B)  $\frac{3+\sqrt{3}}{2}$   
(C)  $\frac{2(3+2\sqrt{3})}{3}$     (D)  $\frac{2}{3}(3 + \sqrt{3})$

86. Which of the following is/are identity/identities?

निम्नलिखित में से कौन सी सर्वसमिका /सर्वसमिकाएँ है/हैं?

- I.  $\frac{\sin^3\theta + \cos^3\theta}{\sin\theta + \cos\theta} + \sin\theta \cos\theta = 1; 0 < \theta < \frac{\pi}{2}$   
II.  $1 - \sin^6\theta = \cos^2\theta(\cos^4\theta + 3\sin^2\theta)$

Select the correct answer using the code given below:-

नीचे दिए गए कोड का उपयोग करके सही उत्तर चुनें:- (CDS 2023)

- A) I only  
B) II only  
C) Both I and II  
D) Neither I nor II

87. If  $7\sin^4\theta + 9\cos^4\theta + 42\sin^2\theta = 16, 0 < \theta < \frac{\pi}{2}$ , then find  $\tan\theta$ ?

यदि  $7\sin^4\theta + 9\cos^4\theta + 42\sin^2\theta = 16, 0 < \theta < \frac{\pi}{2}$ , तो  $\tan\theta$  ज्ञात करें? (CDS 2023)

- A) 1  
B)  $\sqrt{2}$   
C)  $\sqrt{3}$   
D)  $\frac{1}{\sqrt{3}}$

88. If  $\cot\theta = \frac{4}{3}, 0 < \theta < \frac{\pi}{2}$  &  $5p\cos^2\theta\sin\theta = \cot^2\theta$ , then find the value of p?

यदि  $\cot\theta = \frac{4}{3}, 0 < \theta < \frac{\pi}{2}$  &  $5p\cos^2\theta\sin\theta = \cot^2\theta$ , तो p का मान ज्ञात कीजिए? (CPO 2023)

- A) 7/27  
B) 5/27  
C) 25/27  
D) 125/27

89. If  $\frac{\cos\theta}{1-\sin\theta} + \frac{\cos\theta}{1+\sin\theta} = 4, 0^\circ < \theta < 90^\circ$ , then the value of  $(\tan\theta + \operatorname{cosec}\theta)$  is:

यदि  $\frac{\cos\theta}{1-\sin\theta} + \frac{\cos\theta}{1+\sin\theta} = 4, 0^\circ < \theta < 90^\circ$  है, तो  $(\tan\theta + \operatorname{cosec}\theta)$  का मान होगा—

- (a)  $5\frac{\sqrt{2}}{2}$     (b)  $5\frac{\sqrt{3}}{3}$     (c)  $4\frac{\sqrt{3}}{3}$     (d)  $5\frac{\sqrt{2}}{3}$



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90. If  $\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = \frac{4}{\sqrt{3}}$ ,  $0^\circ < \theta < 90^\circ$ , then the value of  $(\tan\theta + \sec\theta)^{-1}$  is :

यदि  $\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = \frac{4}{\sqrt{3}}$ ,  $0^\circ < \theta < 90^\circ$ , तो  $(\tan\theta + \sec\theta)^{-1}$  का मान है :

- a)  $2 + \sqrt{3}$  b)  $2 - \sqrt{3}$  c)  $3 - \sqrt{2}$  d)  $3 + \sqrt{2}$

91. If  $(\frac{1}{1+\csc\theta} - \frac{1}{1-\csc\theta}) \cos\theta = 2$ ,  $0^\circ < \theta < 90^\circ$ , then the value of  $\sin^2\theta + \cot^2\theta + \sec^2\theta$  is:

यदि  $(\frac{1}{1+\csc\theta} - \frac{1}{1-\csc\theta}) \cos\theta = 2$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $\sin^2\theta + \cot^2\theta + \sec^2\theta$  का मान है:

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

92. If  $(\cos^2\theta - 1)(2\sec^2\theta) + \sec^2\theta + 2\tan^2\theta = 2$ ,  $0^\circ < \theta < 90^\circ$ , then the value of

$\frac{(\sec\theta + \sin\theta)}{(\csc\theta - \cos\theta)}$  will be:

यदि  $(\cos^2\theta - 1)(2\sec^2\theta) + \sec^2\theta + 2\tan^2\theta = 2$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $\frac{(\sec\theta + \sin\theta)}{(\csc\theta - \cos\theta)}$  का मान ज्ञात करें।

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

93. The value of  $\frac{32}{\sec^2\theta} - \frac{20}{1+\tan^2\theta} + 12\sin^2\theta$  is:

$\frac{32}{\sec^2\theta} - \frac{20}{1+\tan^2\theta} + 12\sin^2\theta$  का मान है:

1. 20 2. 32 3. 24 4. 12

(SSC SELECTION POST XI 2023)

94.  $\frac{6}{1+\tan^2\alpha} + \frac{2}{1+\cot^2\alpha} + 4\sin^2\alpha - 1 = ?$

- a) 2 b) 3 c) 4 d) 5

95. Simplify  $\sec^2\alpha \left(1 + \frac{1}{\csc\alpha}\right) \left(1 - \frac{1}{\csc\alpha}\right)$ .

$\sec^2\alpha \left(1 + \frac{1}{\csc\alpha}\right) \left(1 - \frac{1}{\csc\alpha}\right)$  का मान ज्ञात करें।

- (a)  $\tan^4\alpha$   
(b) -1  
(c) 1  
(d)  $\sin^2\alpha$

96.

The value of  $(1 + \sin^4 A - \cos^4 A) \csc^2 A$  is:

$(1 + \sin^4 A - \cos^4 A) \csc^2 A$  का मान क्या होगा?

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

(SSC CPO 2023)

97.  $\left(\frac{1}{\cos\theta} - \frac{1}{\sin\theta}\right) + \frac{1}{\csc\theta - \cot\theta} - \frac{1}{\sec\theta + \tan\theta} = ?$

- (a)  $\sec\theta \csc\theta$  (b)  $\sin\theta \tan\theta$   
(c)  $\csc\theta \cot\theta$  (d)  $\sin\theta \cos\theta$

98. A simplified value of  $\left(\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta}\right) \left(\frac{1}{\tan\theta + \cot\theta}\right)$  is:



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$\left(\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta}\right)\left(\frac{1}{\tan\theta+\cot\theta}\right)$  का सरलीकृत मान है:

- a)  $\cos\theta$  b)  $2\sin\theta$  c)  $\sin\theta$  d)  $2\cos\theta$

99. The value of  $\frac{(\sin\theta - \cos\theta)(1 + \tan\theta + \cot\theta)}{(1 + \sin\theta\cos\theta)} = ?$

$\frac{(\sin\theta - \cos\theta)(1 + \tan\theta + \cot\theta)}{1 + \sin\theta\cos\theta}$  का मान है :

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

100. If  $\frac{(\sin\theta - \operatorname{cosec}\theta)(\cos\theta - \sec\theta)}{\tan^2\theta - \sin^2\theta} = r^3$ , then  $r = ?$

यदि  $\frac{(\sin\theta - \operatorname{cosec}\theta)(\cos\theta - \sec\theta)}{\tan^2\theta - \sin^2\theta} = r^3$  है तो  $r$  बराबर है:

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

101. Simplify the given expression.  $\sqrt{\frac{1+\cos P}{1-\cos P}}$

दिए गए व्यंजक को सरल कीजिए।

$$\sqrt{\frac{1+\cos P}{1-\cos P}}$$

- (a)  $\operatorname{cosec} P + \cot P$  (b)  $\tan P + \tan P$   
(c)  $\sec P - \tan P$  (d)  $\operatorname{cosec} P - \cot P$

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102. If  $(1 + \tan^2\theta) + (1 + (\tan^2\theta)^{-1}) = k$ , then  $\sqrt{k} = ?$

यदि  $(1 + \tan^2\theta) + (1 + (\tan^2\theta)^{-1}) = k$  है, तो  $\sqrt{k} = ?$

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

103. The value of  $\tan^2\theta + \cot^2\theta - \sec^2\theta \operatorname{cosec}^2\theta$  is equal to:

$\tan^2\theta + \cot^2\theta - \sec^2\theta \operatorname{cosec}^2\theta$  का मान बराबर है :

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

104.

The value of  $\frac{\sec^2\theta}{\operatorname{cosec}^2\theta} + \frac{\operatorname{cosec}^2\theta}{\sec^2\theta} - (\sec^2\theta + \operatorname{cosec}^2\theta)$  is:

$\frac{\sec^2\theta}{\operatorname{cosec}^2\theta} + \frac{\operatorname{cosec}^2\theta}{\sec^2\theta} - (\sec^2\theta + \operatorname{cosec}^2\theta)$  का मान बराबर है:

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

105. If  $0^\circ < \theta < 90^\circ$ ,  $\sqrt{\frac{\sec^2\theta + \operatorname{cosec}^2\theta}{\tan^2\theta - \sin^2\theta}}$  is equal to:

यदि  $0^\circ < \theta < 90^\circ$  है, तो  $\sqrt{\frac{\sec^2\theta + \operatorname{cosec}^2\theta}{\tan^2\theta - \sin^2\theta}}$  का मान ज्ञात करें।

- (a)  $\sec^3\theta$   
(b)  $\sin^2\theta$   
(c)  $\operatorname{cosec}^3\theta$   
(d)  $\sec^2\theta$

106. The value of  $\frac{\sec\theta \operatorname{cosec}\theta}{2 + \tan^2\theta + \cot^2\theta}$  is equal to:





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$\frac{\sec \theta \cos \theta}{2 + \tan^2 \theta + \cot^2 \theta}$  का मान ज्ञात करें।

- (a)  $\sec \theta \csc \theta$   
 (b)  $\sec \theta \sin \theta$   
 (c)  $\sin \theta \cos \theta$   
 (d)  $\cos \theta \csc \theta$

107.  $\frac{1 + \cos \theta - \sin^2 \theta}{\sin \theta (1 + \cos \theta)} \times \frac{\sqrt{\sec^2 \theta + \csc^2 \theta}}{\tan \theta + \cot \theta}$ ,  $0^\circ < \theta < 90^\circ$ , is equal to:

$\frac{1 + \cos \theta - \sin^2 \theta}{\sin \theta (1 + \cos \theta)} \times \frac{\sqrt{\sec^2 \theta + \csc^2 \theta}}{\tan \theta + \cot \theta} = ?$ ,  $0^\circ < \theta < 90^\circ$

- (a)  $\tan \theta$  (b)  $\sec \theta$  (c)  $\csc \theta$  (d)  $\cot \theta$

108. What will be the value of  $\cos x \csc x - \sin x \sec x$ ?

$\cos x \csc x - \sin x \sec x$  का मान क्या होगा?

- A)  $\cot \frac{2x}{2}$   
 B)  $\tan 2x$   
 C)  $\cot 2x$   
 D)  $2 \cot 2x$

109. Evaluate:  $8 \sec^2 45^\circ + 20 \sin^2 30^\circ + 15 \tan 45^\circ$

$8 \sec^2 45^\circ + 20 \sin^2 30^\circ + 15 \tan 45^\circ$  का मान ज्ञात कीजिए।

- (a) 43 (b) 28 (c) 36 (d) 42

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110. If  $\cos \theta = \frac{\sqrt{3}}{2}$ , then the value of  $\frac{2 - \sin^2 \theta}{1 - \cot^2 \theta} + (\sec^2 \theta + \csc \theta)$  is:

यदि  $\cos \theta = \frac{\sqrt{3}}{2}$  है, तो  $\frac{2 - \sin^2 \theta}{1 - \cot^2 \theta} + (\sec^2 \theta + \csc \theta)$  का मान ज्ञात करें।

- (a)  $\frac{25}{12}$   
 (b)  $\frac{59}{24}$   
 (c)  $-\frac{25}{12}$   
 (d)  $-\frac{59}{24}$

111. The value of  $\frac{4 \tan^2 30^\circ + \frac{1}{4} \sin^2 90^\circ + \frac{1}{8} \cot^2 60^\circ + \sin^2 30^\circ \cos^2 45^\circ}{\sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ}$  is :

$\frac{4 \tan^2 30^\circ + \frac{1}{4} \sin^2 90^\circ + \frac{1}{8} \cot^2 60^\circ + \sin^2 30^\circ \cos^2 45^\circ}{\sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ}$  का मान है:

- a)  $1 \frac{3}{4}$  b) 4 c)  $2 \frac{1}{2}$  d)  $3 \frac{1}{2}$

112. The value of  $\frac{\csc^2 30^\circ \sin^2 45^\circ + \sec^2 60^\circ}{\tan 60^\circ \csc^2 45^\circ - \sec^2 60^\circ \tan 45^\circ}$  is:



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$\frac{\csc^2 30^\circ \sin^2 45^\circ + \sec^2 60^\circ}{\tan 60^\circ \csc^2 45^\circ - \sec^2 60^\circ \tan 45^\circ}$  का मान ज्ञात कीजिए।

(a)  $3(2 + \sqrt{3})$

(b)  $2(\sqrt{3} - 2)$

(c)  $-2\sqrt{3} - 2$

(d)  $-3(2 + \sqrt{3})$

113. Find the value of  $\frac{\tan^2 30^\circ}{\sec^2 30^\circ} + \frac{\csc^2 45^\circ}{\cot^2 45^\circ} - \frac{\sec^2 60^\circ}{\csc^2 60^\circ}$ .

$\frac{\tan^2 30^\circ}{\sec^2 30^\circ} + \frac{\csc^2 45^\circ}{\cot^2 45^\circ} - \frac{\sec^2 60^\circ}{\csc^2 60^\circ}$  का मान ज्ञात करें।

(a)  $-\frac{3}{4}$

(b)  $\frac{5}{4}$

(c)  $\frac{13}{4}$

(d)  $\frac{23}{12}$

114. The value of  $\frac{\tan^2 30^\circ + \sin^2 90^\circ + \cot^2 60^\circ + \sin^2 30^\circ \cos^2 45^\circ}{\sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ}$  is:

$\frac{\tan^2 30^\circ + \sin^2 90^\circ + \cot^2 60^\circ + \sin^2 30^\circ \cos^2 45^\circ}{\sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ}$  का मान ज्ञात करें।

(a)  $\frac{25}{12}$

(b)  $\frac{43}{12}$

(c)  $\frac{37}{12}$

(d)  $\frac{47}{12}$

115. What number should be subtracted from

$4(\sin^4 60^\circ + \cos^4 30^\circ) - (\tan^2 45^\circ - \cot^2 30^\circ) + \cos^2 45^\circ - \csc^2 45^\circ + \sec^2 60^\circ$  to get 2?

2 प्राप्त करने के लिए किस संख्या को  $4(\sin^4 60^\circ + \cos^4 30^\circ) - (\tan^2 45^\circ - \cot^2 30^\circ) + \cos^2 45^\circ - \csc^2 45^\circ + \sec^2 60^\circ$  से घटाया जाना चाहिए?

(a) 5

(b) 4

(c) 7

(d) 3

116. If  $\frac{k - k \cot^2 30^\circ}{1 + \cot^2 30^\circ} = \sin^2 60^\circ + 4 \tan^2 45^\circ - \csc^2 60^\circ$ , then the value of k (correct to two decimal places) is?

यदि  $\frac{k - k \cot^2 30^\circ}{1 + \cot^2 30^\circ} = \sin^2 60^\circ + 4 \tan^2 45^\circ - \csc^2 60^\circ$  है, तो k का मान (दो दशमलव स्थानों तक सही) है?

A) 5.55

B) -6.83

C) -5.58

D) 6.83



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117. The value of  $m[\sin\theta + 2\cos^2\theta + 3\sin\theta + 4\cos^2\theta + \dots + 18\cos^2\theta]$  is a perfect square of an integer,  $\theta = 30^\circ$ ,  $\theta = 45^\circ$  and  $150 \leq m \leq 180$ . Find the value of  $m$ .

यदि  $m[\sin\theta + 2\cos^2\theta + 3\sin\theta + 4\cos^2\theta + \dots + 18\cos^2\theta]$  का मान एक पूर्णांक का एक पूर्ण वर्ग है,  $\theta = 30^\circ$ ,  $\theta = 45^\circ$  और  $150 \leq m \leq 180$ , तो  $m$  का मान ज्ञात करें।

(a) 161

(b) 152

(c) 168

(d) 176

118. If  $A$  is an acute angle, the simplified form of

$$\frac{\cos(\pi-A) \cdot \cot\left(\frac{\pi}{2}+A\right) \cos(-A)}{\tan(\pi+A) \tan\left(\frac{3\pi}{2}+A\right) \sin(2\pi-A)} \text{ is}$$

यदि  $A$  एक न्यून कोण है, तो निम्न का सरलीकृत रूप क्या होगा?

(a)  $\cos^2 A$

(b)  $\sin A$

(c)  $\sin^2 A$

(d)  $\cos A$

119.  $\frac{4}{3} \cot^2 \frac{\pi}{6} + 3 \cos^2 150^\circ - 4 \operatorname{cosec}^2 45^\circ + 8 \sin^2 \frac{\pi}{2} = ?$

a)  $\frac{25}{4}$

b)  $\frac{13}{2}$

c) -1

d)  $-\frac{7}{2}$

120.  $\sin(630^\circ + A) + \cos A = ?$

a)  $\frac{\sqrt{3}}{2}$

b)  $\frac{1}{2}$

c) 0

d) 1

121. If  $A$  is an acute angle, then the simplified form of  $\frac{\cos(\pi-A) \cdot \cot\left(\frac{\pi}{2}+A\right) \cos(-A)}{\tan(\pi+A) \tan\left(\frac{3\pi}{2}+A\right) \sin(2\pi-A)}$  is?

यदि  $A$  एक न्यून कोण है, तो इसका  $\frac{\cos(\pi-A) \cdot \cot\left(\frac{\pi}{2}+A\right) \cos(-A)}{\tan(\pi+A) \tan\left(\frac{3\pi}{2}+A\right) \sin(2\pi-A)}$  सरलीकृत रूप (है)?

A)  $\cos^2 A$

B)  $\sin A$

C)  $\sin^2 A$

D)  $\cos A$

122.  $\operatorname{cosec} 2910^\circ + \sec 4260^\circ + \tan 2565^\circ + \cot 1755^\circ = ?$

A) 3

B) 1

C) 4

D) 0

123.  $\tan 4384^\circ + \cot 6814^\circ = ?$

A) -1

B) 0

C) 2

D) 1



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**Trigonometry Sheet-1****BASIC SHEET****Maths Special Batch****By Gagan Pratap****124. Find the value of  $\cos 47^\circ \sec 133^\circ + \sin 144^\circ \operatorname{cosec} 136^\circ$ .** $\cos 47^\circ \sec 133^\circ + \sin 144^\circ \operatorname{cosec} 136^\circ$  का मान ज्ञात कीजिए।(a)  $1/2$  (b) 1

(c) 0

(d) -1

**SSC CGL 2023 PRE****125. If  $\tan 40^\circ = \alpha$ , then find  $\frac{\tan 320^\circ - \tan 310^\circ}{1 + \tan 320^\circ \tan 310^\circ}$ ?**यदि  $\tan 40^\circ = \alpha$  है, तो  $\frac{\tan 320^\circ - \tan 310^\circ}{1 + \tan 320^\circ \tan 310^\circ}$  का मान ज्ञात कीजिए?A)  $\frac{1-\alpha^2}{\alpha}$ B)  $\frac{1+\alpha^2}{2\alpha}$ C)  $\frac{1-\alpha^2}{2\alpha}$ D)  $\frac{1+\alpha^2}{\alpha}$ **126. If A lies between  $45^\circ$  and  $540^\circ$ , and  $\sin A = 0.5$ , what is the value of  $A/3$  in degrees?**यदि A का मान  $45^\circ$  और  $540^\circ$  के मध्य है, और  $\sin A = 0.5$  है, तो  $A/3$  का मान अंश में कितना होगा?(a)  $170^\circ$ (b)  $175^\circ$ (c)  $165^\circ$ (d)  $160^\circ$ **127. If  $\cos 27^\circ = x$ , then the value of  $\tan 63^\circ$  is:**यदि  $\cos 27^\circ = x$  है, तो  $\tan 63^\circ$  का मान है:(a)  $\frac{\sqrt{1+x^2}}{x}$ (b)  $\frac{x}{\sqrt{1+x^2}}$ (c)  $\frac{\sqrt{1+x^2}}{x}$ (d)  $\frac{x}{\sqrt{1-x^2}}$ **128.  $\frac{2 \sin 22^\circ}{\cos 68^\circ} - \frac{2 \cot 75^\circ}{5 \tan 15^\circ} - \frac{8 \tan 45^\circ \tan 20^\circ \tan 40^\circ \tan 50^\circ \tan 70^\circ}{5}$** 

निम्नलिखित को हल करें।

$$\frac{2 \sin 22^\circ}{\cos 68^\circ} - \frac{2 \cot 75^\circ}{5 \tan 15^\circ} - \frac{8 \tan 45^\circ \tan 20^\circ \tan 40^\circ \tan 50^\circ \tan 70^\circ}{5}$$

(A) 2

(B) 1

(C) 3

(D) 0

**129. If A, B and C be the angles of a triangle, then out of the following, the incorrect relation is:**

a)  $\cos \frac{A+B}{2} = \sin \frac{C}{2}$

b)  $\tan \frac{A+B}{2} = \sec \frac{C}{2}$

c)  $\cot \frac{A+B}{2} = \tan \frac{C}{2}$

d)  $\sin \frac{A+B}{2} = \cos \frac{C}{2}$

**130. The value of the expression  $\cos^2 45^\circ + \cos^2 135^\circ + \cos^2 225^\circ + \cos^2 315^\circ$  is:**व्यंजक  $\cos^2 45^\circ + \cos^2 135^\circ + \cos^2 225^\circ + \cos^2 315^\circ$  का मान है—

(a) 2

(b)  $1/2$ (c)  $3/2$ 

(d) 1

**131. If  $\cos 48^\circ = \frac{m}{n}$ , then  $\sec 48^\circ - \cot 42^\circ$  is equal to:**यदि  $\cos 48^\circ = \frac{m}{n}$  है, तो  $\sec 48^\circ - \cot 42^\circ$  \_\_\_\_\_ के बराबर है।



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(a)  $\frac{m-\sqrt{n^2-m^2}}{m}$

(b)  $\frac{m-\sqrt{n^2-m^2}}{n}$

(c)  $\frac{n-\sqrt{n^2-m^2}}{n}$

(d)  $\frac{n-\sqrt{n^2-m^2}}{m}$

132.  $\cos 19^\circ = \frac{a}{b}$  then  $\operatorname{cosec} 19^\circ - \cos 71^\circ = ?$

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

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

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

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

133.  $\Delta PQR$  is a right angled triangle.  $\angle Q = 90^\circ$ ,  $PQ = 12$  cm,  $QR = 5$  cm.

What is the value of  $\cot P - \tan R$ ?

$\Delta PQR$  एक समकोण त्रिभुज है।  $\angle Q = 90^\circ$  डिग्री,  $PQ = 12$  cm,  $QR = 5$  cm है।  $\cot P - \tan R$  का मान क्या है?

(a)  $5/24$

(b)  $5/6$

(c)  $5/13$

(d)  $0$

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134. Triangle ABC is a right-angle triangle at B. If  $\tan A = \frac{5}{12}$ , then  $\sin A + \sin B + \sin C$  will be equal to?

त्रिभुज ABC, B पर एक समकोण त्रिभुज है। यदि  $\tan A = 5/12$ , तो  $\sin A + \sin B + \sin C$  किसके बराबर होगा?

A)  $2\frac{1}{13}$

B)  $1\frac{5}{13}$

C)  $3\frac{1}{13}$

D)  $2\frac{4}{13}$

135. In  $\Delta ABC$ , right angled at B, if  $\tan A = \frac{1}{2}$ , then the value of  $\frac{\sin A(\cos C + \cos A)}{\cos C(\sin C - \sin A)}$  is:

$\Delta ABC$  में, जो B पर समकोण है, यदि  $\tan A = \frac{1}{2}$  है, तो  $\frac{\sin A(\cos C + \cos A)}{\cos C(\sin C - \sin A)}$  का मान ज्ञात कीजिए।

(a)  $2\sqrt{5}$

(b)  $3$

(c)  $2$

(d)  $1$

136. In  $\Delta PQR$ ,  $\angle Q = 90^\circ$ . If  $\tan R = \frac{1}{3}$ , then what is the value of  $\frac{\sec P(\cos R + \sin P)}{\operatorname{cosec} R(\sin R - \operatorname{cosec} P)}$ ?

$\Delta PQR$  में,  $\angle Q = 90^\circ$  है। यदि  $\tan R = \frac{1}{3}$  है, तो  $\frac{\sec P(\cos R + \sin P)}{\operatorname{cosec} R(\sin R - \operatorname{cosec} P)}$  का मान ज्ञात करें।

(a)  $-\frac{2}{7}$

(b)  $\frac{18}{7}$

(c)  $\frac{2}{7}$

(d)  $-\frac{18}{7}$

137. What is the value of  $\frac{4}{3}(\sin^2 35^\circ + \sin^2 55^\circ)$ ?



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**Trigonometry Sheet-1****BASIC SHEET****Maths Special Batch****By Gagan Pratap** $\frac{4}{3} (\sin^2 35^\circ + \sin^2 55^\circ)$  का मान क्या है?

- (a)  $\frac{8}{9}$   
**(b)  $\frac{4}{3}$**   
 (c)  $\frac{3}{4}$   
 (d)  $\frac{2}{3}$

**SSC CHSL TIER - I 2022**138. What is the value of  $\frac{3 \operatorname{cosec} 42^\circ}{\sec 48^\circ} - \frac{5 \cos 32^\circ}{\sin 58^\circ}$  $\frac{3 \operatorname{cosec} 42^\circ}{\sec 48^\circ} - \frac{5 \cos 32^\circ}{\sin 58^\circ}$  का मान क्या है?

- (a)  $-1$   
 (b)  $5$   
 (c)  $0$   
**(d)  $-2$**

**SSC CHSL TIER - I 2022**139. What is the value of  $\frac{5}{2} \left\{ \frac{\cos 37^\circ}{\sin 53^\circ} \right\} - \frac{1}{2} (\sin^2 39^\circ + \sin^2 51^\circ)$ ? $\frac{5}{2} \left\{ \frac{\cos 37^\circ}{\sin 53^\circ} \right\} - \frac{1}{2} (\sin^2 39^\circ + \sin^2 51^\circ)$  का मान क्या है?

- (a)  $\sin^2 51^\circ - \sin 53^\circ$   
 (b)  $\sin 53^\circ + \tan 51^\circ$   
**(c)  $2$**   
 (d)  $1$

140. The value of  $\frac{\sin^2 52^\circ + 2 + \sin^2 38^\circ}{4 \cos^2 43^\circ - 5 + 4 \cos^2 47^\circ}$  is: $\frac{\sin^2 52^\circ + 2 + \sin^2 38^\circ}{4 \cos^2 43^\circ - 5 + 4 \cos^2 47^\circ}$  का मान ज्ञात करें।

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

141.

Find the value of  $\frac{\cos 65^\circ}{\sin 25^\circ} + \frac{5 \sin 19^\circ}{\cos 71^\circ} - \frac{3 \cos 28^\circ}{\sin 62^\circ}$  का मान ज्ञात कीजिए।

- (a)  $3$  (b)  $2$   
**(c)  $1$**  (d)  $0$

**(SSC CPO 2023)**142. The value of  $\left[ \frac{\sin^2 27^\circ + \sin^2 63^\circ}{\cos^2 24^\circ + \cos^2 66^\circ} - \sin^2 69^\circ - \cos 69^\circ \sin 21^\circ \right]$  is: $\left[ \frac{\sin^2 27^\circ + \sin^2 63^\circ}{\cos^2 24^\circ + \cos^2 66^\circ} - \sin^2 69^\circ - \cos 69^\circ \sin 21^\circ \right]$  का मान ज्ञात करें।

- (a)  $3$   
 (b)  $2$   
**(c)  $0$**



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(d) 1

143. The value of  $\frac{3\cos^2 27^\circ - 5 + 3\cos^2 63^\circ}{\tan^2 32^\circ + 4 - \operatorname{cosec}^2 58^\circ} + \sin 35^\circ \cos 55^\circ + \cos 35^\circ \sin 55^\circ$  is:

$\frac{3\cos^2 27^\circ - 5 + 3\cos^2 63^\circ}{\tan^2 32^\circ + 4 - \operatorname{cosec}^2 58^\circ} + \sin 35^\circ \cos 55^\circ + \cos 35^\circ \sin 55^\circ$  is: का मान ज्ञात करें।

(a)  $-\frac{1}{4}$

(b)  $-\frac{1}{3}$

(c)  $\frac{1}{3}$

(d)  $1\frac{2}{3}$

144. What is the value of  $\frac{\tan^2 60^\circ - 2\sin^2 45^\circ}{\cos 24^\circ \cos 37^\circ \operatorname{cosec} 53^\circ \cos 60^\circ \operatorname{cosec} 66^\circ + \sin^2 60^\circ}$

$\frac{\tan^2 60^\circ - 2\sin^2 45^\circ}{\cos 24^\circ \cos 37^\circ \operatorname{cosec} 53^\circ \cos 60^\circ \operatorname{cosec} 66^\circ + \sin^2 60^\circ}$  का मान ज्ञात करें।

(a)  $1\frac{4}{5}$

(b) 1

(c) 2

(d)  $1\frac{3}{5}$

145. What is the value of  $\frac{\sin 33^\circ \cos 57^\circ + \sec 62^\circ \sin 28^\circ + \cos 33^\circ \sin 57^\circ + \operatorname{cosec} 62^\circ \cos 28^\circ}{\tan 15^\circ \tan 35^\circ \tan 60^\circ \tan 55^\circ \tan 75^\circ}$ ?

$\frac{\sin 33^\circ \cos 57^\circ + \sec 62^\circ \sin 28^\circ + \cos 33^\circ \sin 57^\circ + \operatorname{cosec} 62^\circ \cos 28^\circ}{\tan 15^\circ \tan 35^\circ \tan 60^\circ \tan 55^\circ \tan 75^\circ}$  का मान ज्ञात करें।

(a)  $\frac{\sqrt{3}}{3}$

(b) 2

(c)  $2\sqrt{3}$

(d)  $\sqrt{3}$

146. Find the value of  $2\operatorname{cosec}^2 23^\circ \cot^2 67^\circ - \sin^2 23^\circ - \sin^2 67^\circ - \cot^2 67^\circ$ .

$2\operatorname{cosec}^2 23^\circ \cot^2 67^\circ - \sin^2 23^\circ - \sin^2 67^\circ - \cot^2 67^\circ$  का मान ज्ञात कीजिए।

(a)  $\sec^2 23^\circ$

(b) 1

(c)  $\tan^2 23^\circ$

(d) 0

147. The value of  $\tan^2 48^\circ - \operatorname{cosec}^2 42^\circ + \operatorname{cosec} (67^\circ + \theta) - \sec(23^\circ - \theta)$  is:

$\tan^2 48^\circ - \operatorname{cosec}^2 42^\circ + \operatorname{cosec} (67^\circ + \theta) - \sec(23^\circ - \theta)$  का मान ज्ञात कीजिए।

(a) -1

(b) 0

(c) 1

(d) -2



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148. The value of  $\operatorname{cosec}(58^\circ + \theta) - \sec(32^\circ - \theta) + \sin 15^\circ \sin 35^\circ \sec 55^\circ \sin 30^\circ \sec 75^\circ$  is:

$\operatorname{cosec}(58^\circ + \theta) - \sec(32^\circ - \theta) + \sin 15^\circ \sin 35^\circ \sec 55^\circ \sin 30^\circ \sec 75^\circ$  का मान ज्ञात करें।

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

149. If  $\operatorname{cosec} 31^\circ = x$ , then  $\sin^2 59^\circ + \frac{1}{\operatorname{cosec}^2 31^\circ} + \tan^2 59^\circ - \frac{1}{\sin^2 59^\circ \operatorname{cosec}^2 59^\circ}$  is equal to:

अगर  $\operatorname{cosec} 31^\circ = x$ , है, तो  $\sin^2 59^\circ + \frac{1}{\operatorname{cosec}^2 31^\circ} + \tan^2 59^\circ - \frac{1}{\sin^2 59^\circ \operatorname{cosec}^2 59^\circ}$  बराबर है:

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

150. If  $x = \sec 57^\circ$ , then  $\cot^2 33^\circ + \sin^2 57^\circ + \sin^2 33^\circ + \operatorname{cosec}^2 57^\circ \cos^2 33^\circ + \sec^2 33^\circ \sin^2 57^\circ$  is equal to:

यदि  $x = \sec 57^\circ$  है, तो  $\cot^2 33^\circ + \sin^2 57^\circ + \sin^2 33^\circ + \operatorname{cosec}^2 57^\circ \cos^2 33^\circ + \sec^2 33^\circ \sin^2 57^\circ$  बराबर है।

- (a)  $x^2 + 2$  (b)  $2x^2 + 1$  (c)  $x^2 + 1$  (d)  $\frac{1}{x^2+1}$

151. IF  $\sin 20^\circ = a$ , then find  $\frac{\sin 110^\circ - \cos 160^\circ}{\tan 200^\circ}$ ?

यदि  $\sin 20^\circ = a$  है, तो  $\frac{\sin 110^\circ - \cos 160^\circ}{\tan 200^\circ}$  ज्ञात कीजिये ?

- A)  $\frac{2(1-a)}{a}$  C)  $\frac{2(1+a)}{a}$   
B)  $\frac{2(1-a^2)}{a}$  D)  $\frac{2(1+a^2)}{a}$

152.  $\sin^2 \frac{\pi}{32} + \sin^2 \frac{7\pi}{32} + \sin^2 \frac{9\pi}{32} + \sin^2 \frac{15\pi}{32}$

- a)  $\frac{8}{3}$  b) 2 c)  $\frac{7}{4}$  d)  $\frac{5}{16}$

153.  $\cos^2 \frac{\pi}{40} + \cos^2 \frac{3\pi}{40} + \cos^2 \frac{7\pi}{40} + \cos^2 \frac{10\pi}{40} + \cos^2 \frac{13\pi}{40} + \cos^2 \frac{17\pi}{40} + \cos^2 \frac{19\pi}{40} = ?$

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

154. The value of  $\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^\circ + \dots + \sin^2 85^\circ + \sin^2 90^\circ$  is equal to:

$\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^\circ + \dots + \sin^2 85^\circ + \sin^2 90^\circ$  का मान ..... के बराबर है।

- (a)  $9\frac{1}{2}$  (b) 9 (c)  $8\frac{1}{2}$  (d) 8

155. The value of  $(\tan 29^\circ \cot 61^\circ - \operatorname{cosec}^2 61^\circ) + \cot^2 54^\circ - \sec^2 36^\circ +$

$(\sin^2 1^\circ + \sin^2 3^\circ + \sin^2 5^\circ + \dots + \sin^2 89^\circ)$  is:

$(\tan 29^\circ \cot 61^\circ - \operatorname{cosec}^2 61^\circ) + \cot^2 54^\circ - \sec^2 36^\circ + (\sin^2 1^\circ + \sin^2 3^\circ + \sin^2 5^\circ + \dots + \sin^2 89^\circ)$  का मान है :

- a)  $22\frac{1}{2}$  b) 21 c)  $20\frac{1}{2}$  d) 22

156. The value of  $\frac{(\tan 25^\circ \cot 65^\circ - \operatorname{cosec}^2 65^\circ) + \cot^2 61^\circ - \sec^2 29^\circ}{\sin^2 5^\circ + \sin^2 7^\circ + \sin^2 9^\circ + \dots + \sin^2 85^\circ}$  is:

$\frac{(\tan 25^\circ \cot 65^\circ - \operatorname{cosec}^2 65^\circ) + \cot^2 61^\circ - \sec^2 29^\circ}{\sin^2 5^\circ + \sin^2 7^\circ + \sin^2 9^\circ + \dots + \sin^2 85^\circ}$  का मान ज्ञात करें।

- (a)  $\frac{2}{45}$   
(b)  $\frac{4}{45}$   
(c)  $\frac{-2}{41}$





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(d)  $\frac{-4}{41}$

157.  $\cos^2 1^\circ + \cos^2 2^\circ + \cos^2 3^\circ + \dots \cos^2 90^\circ = ?$

158. Find the value of  $\frac{\tan 1^\circ}{1+\tan 1^\circ} + \frac{\tan 2^\circ}{1+\tan 2^\circ} + \dots + \frac{\tan 89^\circ}{1+\tan 89^\circ} = ?$

- a) 44.5      b) 45      c) 44      d) 89

159.  $\tan 7^\circ \cdot \tan 11^\circ \cdot \tan 23^\circ \cdot \tan 30^\circ \cdot \tan 45^\circ \cdot \tan 67^\circ \cdot \tan 79^\circ \cdot \tan 83^\circ = ?$

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

160. The value of  $\cot 13^\circ \cot 27^\circ \cot 60^\circ \cot 63^\circ \cot 77^\circ$  is:

$\cot 13^\circ \cot 27^\circ \cot 60^\circ \cot 63^\circ \cot 77^\circ$  का मान ज्ञात कीजिए।

- (a)  $\sqrt{3}$       (b) 1      (c) 0      (d)  $\frac{1}{\sqrt{3}}$

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161. What is the value of  $\cos 1^\circ \cdot \cos 2^\circ \cdot \cos 3^\circ \dots \cos 177^\circ \cdot \cos 178^\circ \cdot \cos 179^\circ$

$\cos 1^\circ \cos 2^\circ \cdot \cos 3^\circ \dots \cos 177^\circ \cdot \cos 178^\circ \cdot \cos 179^\circ$  का मान क्या है?

1. 0      2. 1      3.  $\frac{1}{\sqrt{2}}$       4.  $\frac{1}{2}$

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162.  $\frac{\sin 37^\circ}{\cos 53^\circ} + \frac{2 \tan 49^\circ}{\cot 41^\circ} - 5(\cot 11^\circ \cdot \cot 31^\circ \cdot \cot 45^\circ \cdot \cot 59^\circ \cdot \cot 79^\circ) + 3(\sin^2 76.5^\circ + \sin^2 \frac{3\pi}{40})$

- a) 1      b) 0      c) -1      d) 2

163. The value of  $\frac{(\cos 9^\circ + \sin 81^\circ)(\sec 9^\circ + \operatorname{cosec} 81^\circ)}{\sin 56^\circ \sec 34^\circ + \cos 25^\circ \operatorname{cosec} 65^\circ}$  is:

$\frac{(\cos 9^\circ + \sin 81^\circ)(\sec 9^\circ + \operatorname{cosec} 81^\circ)}{\sin 56^\circ \sec 34^\circ + \cos 25^\circ \operatorname{cosec} 65^\circ}$  का मान है:

- a)  $\frac{1}{2}$       b) 4      b) 2      d) 1

164. The value of  $\frac{(\sin 17^\circ + \cos 73^\circ)(\sec 73^\circ + \operatorname{cosec} 17^\circ)}{\operatorname{cosec}^2 71^\circ + \cos^2 15^\circ - \tan^2 19^\circ + \cos^2 75^\circ}$  is:

$\frac{(\sin 17^\circ + \cos 77^\circ)(\sec 73^\circ + \operatorname{cosec} 17^\circ)}{\operatorname{cosec}^2 71^\circ + \cos^2 15^\circ - \tan^2 19^\circ + \cos^2 75^\circ} = ?$

- (a) 1      (b) 4      (c) -3      (d) 2

165. The value of  $\frac{\tan(45^\circ - \alpha)}{\cot(45^\circ + \alpha)} \cdot \frac{(\cos 19^\circ + \sin 71^\circ)(\sec 19^\circ + \operatorname{cosec} 71^\circ)}{\tan 12^\circ \tan 24^\circ \tan 66^\circ \tan 78^\circ}$  is:

$\frac{\tan(45^\circ - \alpha)}{\cot(45^\circ + \alpha)} \cdot \frac{(\cos 19^\circ + \sin 71^\circ)(\sec 19^\circ + \operatorname{cosec} 71^\circ)}{\tan 12^\circ \tan 24^\circ \tan 66^\circ \tan 78^\circ}$  का मान ज्ञात करें।

(a) -3

(b) 0

(c) -2

(d) 2

166. The value of  $\frac{\tan 13^\circ \tan 36^\circ \tan 45^\circ \tan 54^\circ \tan 77^\circ}{2 \sec^2 60^\circ (\sin^2 60^\circ - 3 \cos 60^\circ + 2)}$  is:

$\frac{\tan 13^\circ \tan 36^\circ \tan 45^\circ \tan 54^\circ \tan 77^\circ}{2 \sec^2 60^\circ (\sin^2 60^\circ - 3 \cos 60^\circ + 2)}$  का मान ज्ञात करें।

(a)  $-\frac{1}{4}$



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(b)  $-\frac{1}{10}$

(c)  $\frac{1}{10}$

(d)  $\frac{1}{4}$

167.

$2(\sin 1^\circ \times \sec 89^\circ) + 3(\cos 11^\circ \times \operatorname{cosec} 79^\circ) + 5(\tan 21^\circ \times \tan 69^\circ) = ?$

(a) 20

(b) 12

(c) 11

(d) 10

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168.

If  $A+B = 90^\circ$ , then the expression  $\frac{\cot A}{\cot B} + \cos^2 A + \cos^2 B$  is equal to:

यदि  $A + B = 90^\circ$  है, तो व्यंजक  $\frac{\cot A}{\cot B} + \cos^2 A + \cos^2 B$  किसके बराबर है?

(a)  $\cot^2 B$

(b)  $\operatorname{cosec}^2 A$

(c)  $\operatorname{cosec}^2 B$

(d)  $\cot^2 A$

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169.

The value of  $\frac{\sqrt{2}\tan(60^\circ-\theta)\tan(30^\circ+\theta)}{\sin^2(45^\circ+\theta)+\sin^2(45^\circ-\theta)}$  is

$\frac{\sqrt{2}\tan(60^\circ-\theta)\tan(30^\circ+\theta)}{\sin^2(45^\circ+\theta)+\sin^2(45^\circ-\theta)}$  का मान ज्ञात करें।

(a)  $\frac{1}{\sqrt{2}}$

(b) 1

(c) 2

(d)  $\sqrt{2}$

170.

The value of  $\frac{\cos 8^\circ \cos 24^\circ \cos 60^\circ \cos 66^\circ \cos 82^\circ}{\sin 82^\circ \sin 66^\circ \sin 60^\circ \sin 8^\circ \sin 24^\circ}$  is:

$\frac{\cos 8^\circ \cos 24^\circ \cos 60^\circ \cos 66^\circ \cos 82^\circ}{\sin 82^\circ \sin 66^\circ \sin 60^\circ \sin 8^\circ \sin 24^\circ}$  का मान कितना होगा?

(a) 1

(b)  $\frac{1}{\sqrt{2}}$

(c)  $\frac{1}{\sqrt{3}}$

(d) 0

171.

Evaluate the following expression.

दिए गए व्यंजक का मान ज्ञात करें।

$\frac{3(\cot^2 46^\circ - \sec^2 44^\circ)}{2(\sin^2 28^\circ + \sin^2 62^\circ)} + \frac{2 \cos^2 60^\circ \tan^2 33^\circ \tan^2 57^\circ}{\sin^2(90^\circ - \theta) - \cot^2 \theta}$

(a) -1

(b) 1

(c) -2

(d) 2



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172. The value of  $\frac{4\tan^2 30^\circ + \sin^2 30^\circ \cos^2 45^\circ + \sec^2 48^\circ - \cot^2 42^\circ}{\cos 37^\circ \sin 53^\circ + \sin 37^\circ \cos 53^\circ + \tan 18^\circ \tan 72^\circ}$  is:

$\frac{4\tan^2 30^\circ + \sin^2 30^\circ \cos^2 45^\circ + \sec^2 48^\circ - \cot^2 42^\circ}{\cos 37^\circ \sin 53^\circ + \sin 37^\circ \cos 53^\circ + \tan 18^\circ \tan 72^\circ}$  का मान ज्ञात करें।  
 (a)  $\frac{35}{48}$  (b)  $\frac{59}{48}$  (c)  $\frac{49}{24}$  (d)  $\frac{35}{24}$

173. The value of  $\frac{3(\csc^2 26^\circ - \tan^2 64^\circ) + (\cot^2 42^\circ - \sec^2 48^\circ)}{\cot(22^\circ - \theta) - \csc^2(62^\circ + \theta) - \tan(\theta + 68^\circ) + \tan^2(28^\circ - \theta)}$  is:

$\frac{3(\csc^2 26^\circ - \tan^2 64^\circ) + (\cot^2 42^\circ - \sec^2 48^\circ)}{\cot(22^\circ - \theta) - \csc^2(62^\circ + \theta) - \tan(\theta + 68^\circ) + \tan^2(28^\circ - \theta)}$  का मान है।  
 (a) 3 (b) 4 (c) -1 (d) -2

174. What is the value of  $\frac{\csc(78^\circ + \theta) - \sec(12^\circ - \theta) - \tan(67^\circ + \theta) + \cot(23^\circ - \theta)}{\tan 13^\circ \tan 37^\circ \tan 45^\circ \tan 53^\circ \tan 77^\circ}$  ?

$\frac{\csc(78^\circ + \theta) - \sec(12^\circ - \theta) - \tan(67^\circ + \theta) + \cot(23^\circ - \theta)}{\tan 13^\circ \tan 37^\circ \tan 45^\circ \tan 53^\circ \tan 77^\circ}$  का मान क्या है ?  
 a) 1 (b) 0 (c) 2 (d) -1

175. The value of  $\frac{2\sin^2 38^\circ \sec^2 52^\circ + \cos 64^\circ \sin 26^\circ + \sin^2 64^\circ}{\tan^2 23^\circ + \cot^2 23^\circ - \sec^2 67^\circ - \csc^2 67^\circ}$  is:

$\frac{2\sin^2 38^\circ \sec^2 52^\circ + \cos 64^\circ \sin 26^\circ + \sin^2 64^\circ}{\tan^2 23^\circ + \cot^2 23^\circ - \sec^2 67^\circ - \csc^2 67^\circ}$  का मान ज्ञात कीजिए।  
 (a) -2 (b)  $\frac{3}{2}$   
 (c) 2 (d)  $\frac{-3}{2}$

176. If  $\cos \theta - \sin \theta = \sqrt{3} \cos(90^\circ - \theta)$ ,  $0^\circ < \theta < 90^\circ$  then find the value of  $\tan \theta - \cot \theta$ .

यदि  $\cos \theta - \sin \theta = \sqrt{3} \cos(90^\circ - \theta)$ ,  $0^\circ < \theta < 90^\circ$  है, तो  $\tan \theta - \cot \theta$  का मान ज्ञात करें।

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

177. If  $6(\sec^2 59^\circ - \cot^2 31^\circ) - \frac{2}{3} \sin^2 90^\circ - 3 \tan^2 56^\circ \tan^2 34^\circ = \frac{y}{3}$ , then the value of y is:

यदि  $6(\sec^2 59^\circ - \cot^2 31^\circ) - \frac{2}{3} \sin^2 90^\circ - 3 \tan^2 56^\circ \tan^2 34^\circ = \frac{y}{3}$  है तो y का मान है:

a)  $\frac{8}{5}$  (b)  $-\frac{8}{5}$  (c)  $\frac{2}{3}$  (d)  $\frac{-2}{3}$

178. If  $\sin 3A = \cos(A + 10^\circ)$ , where  $3A$  is an acute angle, then what is the value of  $2\csc \frac{3A}{2} + 6\sin^2 3A - \frac{3}{2} \tan^2 3A$ ?

यदि  $\sin 3A = \cos(A + 10^\circ)$  है, जहाँ  $3A$  न्यून कोण है, तो  $2\csc \frac{3A}{2} + 6\sin^2 3A - \frac{3}{2} \tan^2 3A$  का मान ज्ञात कीजिए?

(a)  $\frac{7}{4}$  (b) 4 (c)  $\frac{17}{2}$  (d) 5

179. If  $\cos(2\theta + 54^\circ) = \sin \theta$ ,  $0^\circ < (2\theta + 54^\circ) < 90^\circ$ , then what is the value of  $\frac{1}{\tan 5\theta + \csc \frac{5\theta}{2}}$ ?



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यदि  $\cos(2\theta + 54^\circ) = \sin\theta$ ,  $0^\circ < (2\theta + 54^\circ) < 90^\circ$  है, तो  $\frac{1}{\tan 5\theta + \operatorname{cosec} \frac{5\theta}{2}}$  का मान ज्ञात कीजिए।

- (a)  $2 + \sqrt{3}$  (b)  $3\sqrt{2}$  (c)  $2\sqrt{3}$  (d)  $2 - \sqrt{3}$

180.  $\tan(80-11^\circ) \cdot \tan(110-13^\circ) = 1$ , then find the value of  $\sin 100 + \cos 50^\circ$

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

181. If  $\tan x = \cot(48^\circ + 2x)$ , and  $0^\circ < x < 90^\circ$ , then what is the value of  $x$ ?

यदि  $\tan x = \cot(48^\circ + 2x)$ , और  $0^\circ < x < 90^\circ$  है, तो  $x$  का मान ज्ञात करें?

- (a)  $12^\circ$   
(b)  $14^\circ$   
(c)  $16^\circ$   
(d)  $21^\circ$

182. If  $\tan(5\theta - 10^\circ) = \cot(5\phi + 20^\circ)$ , then the value of  $\theta + \phi$  is:

यदि  $\tan(5\theta - 10^\circ) = \cot(5\phi + 20^\circ)$  है, तो  $\theta + \phi$  का मान क्या है?

- (a)  $16^\circ$  (b)  $20^\circ$  (c)  $18^\circ$  (d)  $15^\circ$

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183. If  $\tan 2\theta = \cot(\theta - 36^\circ)$ , where  $2\theta$  is an acute angle,

then the value of  $\theta$  is:

यदि  $\tan 2\theta = \cot(\theta - 36^\circ)$ , जहाँ  $2\theta$  एक कोण है, तो  $\theta$  का मान ज्ञात कीजिए।

- (a)  $18^\circ$  (b)  $30^\circ$   
(c)  $36^\circ$  (d)  $42^\circ$

184. If  $\tan(70^\circ - 3\theta) = \cot(9\theta - 280^\circ)$  then  $\tan \frac{6\theta}{5} + \cos(\theta - 20^\circ) = ?$

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

185. If  $\tan(11\theta) = \cot(7\theta)$ , then what is the value of  $\sin^2(6\theta) + \sec^2(9\theta) + \operatorname{cosec}^2(12\theta)$ ?

यदि  $\tan(11\theta) = \cot(7\theta)$  है, तो  $\sin^2(6\theta) + \sec^2(9\theta) + \operatorname{cosec}^2(12\theta)$  का मान ज्ञात कीजिए।

- (a)  $\frac{35}{12}$  (b)  $\frac{23}{6}$  (c)  $\frac{31}{12}$  (d)  $\frac{43}{12}$

186. If  $\sin(3x - 23^\circ) \cdot \sec(5x - 37^\circ) = 1$  then  $x$ ?

- a)  $16^\circ$  b)  $15.25^\circ$  c)  $12.25^\circ$  d)  $18.75^\circ$

187. If  $\sin 3\theta \cdot \sec 2\theta = 1$ , then what is the value of  $[3\tan^2(5\theta/2) - 1]$ ?

यदि  $\sin 3\theta \cdot \sec 2\theta = 1$ , तो  $[3\tan^2(5\theta/2) - 1]$  का मान क्या होगा?

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

188. If  $\operatorname{cosec} 2\theta = \sec(3\theta - 15^\circ)$ , then  $\theta$  is equal to:

यदि  $\operatorname{cosec} 2\theta = \sec(3\theta - 15^\circ)$  है, तो  $\theta$  बराबर है

- (a)  $22^\circ$  (b)  $20^\circ$  (c)  $25^\circ$  (d)  $21^\circ$

189. If  $\sec(5\alpha - 15^\circ) = \operatorname{cosec}(15^\circ - 2\alpha)$ , then the value of  $\cos \alpha + \sin 2\alpha + \tan(1.5\alpha)$  is:

यदि  $\sec(5\alpha - 15^\circ) = \operatorname{cosec}(15^\circ - 2\alpha)$  है, तो  $\cos \alpha + \sin 2\alpha + \tan(1.5\alpha)$  का मान ज्ञात करें।

- (a)  $\sqrt{2} + 1$



Maths By Gagan Pratap

# Trigonometry Sheet-1

## BASIC SHEET

Maths Special Batch

By Gagan Pratap

(b)  $\sqrt{2} - 1$

(c)  $\sqrt{3} - 1$

(d)  $\sqrt{3} + 1$

190. If  $2\sec 2\theta = \tan \phi + \cot \phi$ , then one of the values of  $\theta + \phi = ?$

यदि  $2\sec 2\theta = \tan \phi + \cot \phi$ , तो  $\theta + \phi$  का एक मान होना चाहिए = ?

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

191. If  $0 < \theta < \frac{\pi}{2}$ ,  $0 < \phi < \frac{\pi}{2}$  and  $\cos \theta < \cos \phi$ , then which of the following is correct?

- a)  $\theta < \phi$  b)  $\theta > \phi$  c)  $\theta + \phi = 90^\circ$  d) none

192. Which of the following is true for  $0^\circ < \theta < 90^\circ$ ?

- a)  $\cos \theta \leq \cos^2 \theta$  b)  $\cos \theta > \cos^2 \theta$  c)  $\cos \theta < \cos^2 \theta$  d)  $\cos \theta \geq \cos^2 \theta$

193. If  $0 < x < \frac{\pi}{2}$  then  $(\sin x + \operatorname{cosec} x)$  is

- a)  $> 2$  b)  $< 2$  c)  $\leq 2$  d)  $\geq 2$

194.  $\sec^2 \theta = \frac{4xy}{(x+y)^2}$  is possible when

- a)  $x = -y$  b)  $x < y$   
c)  $x > y$  d)  $x = y$

195. For what relation between a and b is the equation  $\sin \theta = \frac{a+b}{2\sqrt{ab}}$  possible?

a और b के बीच किस संबंध के लिए समीकरण  $\sin \theta = \frac{a+b}{2\sqrt{ab}}$  संभव है? (CDS 2023)

- A)  $a=b$   
B)  $a>b$   
C)  $a \leq b$   
D)  $a \geq b$

196. If the sum and difference of two angles are  $135^\circ$  and  $\frac{\pi}{12}$  respectively, then the value of the largest angles in radian measure is:

दो कोणों का योग और अंतर क्रमश  $135^\circ$  और  $\frac{\pi}{12}$  है, तब बड़े कोण का मान रेडियन में ज्ञात करे ?

- a)  $\frac{2\pi}{3}$  b)  $\frac{3\pi}{5}$  c)  $\frac{5\pi}{12}$  d)  $\frac{\pi}{2}$

197. If the sum and difference of two angles are  $22/9$  radian and  $36^\circ$  respectively, then the value of the smallest angles in degree measure is?

दो कोणों का योग और अंतर क्रमश  $22/9$  रेडियन और  $36^\circ$  है, तब छोटे कोण का मान रेडियन में ज्ञात करे ?

- a)  $52^\circ$  b)  $60^\circ$  c)  $56^\circ$  d)  $48^\circ$

198. Consider the following statements:

$\sin 1^\circ > \sin 1$

$\cos 1^\circ < \cos 1$

Which of the following statements is /are correct?

- a) 1 only b) 2 only c) both 1 & 2 d) none