



## MATHS

### BOOKS - S CHAND MATHS (ENGLISH)

### TRIGONOMETRIC FUNCTION

#### Multiple Choice Questions

1. 1 radian is approximately equal to

A.  $57^{\circ} 16'$

B.  $47^{\circ} 18' 30''$

C.  $53^{\circ} 17' 45''$

D.  $43^{\circ} 16'$

**Answer: A**

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2.  $1^{\circ}$  is approximately equal is

- A. 0.001746 radians
- B. 0.01746 radians
- C. 0.0001746 radians
- D. 0.1746 radians

**Answer:**

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3. If  $\theta$  lies in second quadrant, then the quadrant in which  $-\frac{\theta}{2}$  lies is

A. I quadrant

B. II quadrant

C. III quadrant

D. IV quadrant

**Answer: D**



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4. The angle is degree measure between two hands of a clock at 8:30 p.m. is

A.  $55^\circ$

B.  $66^\circ$

C.  $75^\circ$

D.  $80^\circ$

**Answer: C**



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5. The angle subtended by an arc of length 20 cm at the centre of circle when radius is 14 cm is

A.  $\frac{5}{7}$  radians

B.  $\frac{10}{7}$  radians

C.  $\frac{5}{14}$  radians

D.  $\frac{7}{10}$  radians

**Answer: B**



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6. A wheel make 450 revolutions per hour. The number of radians through which its turn in one second is

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

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

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

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

**Answer: A**



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7. If  $\sin x = \frac{3}{5}$ , then  $\cos x$  is

A.  $\frac{4}{5}$  but not  $-\frac{4}{5}$

B.  $\frac{4}{5}$  or  $-\frac{4}{5}$

C.  $-\frac{4}{5}$  but not  $\frac{4}{5}$

D. none of these

**Answer: B**



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8. The value of  $\operatorname{cosec}(-750^\circ)$  is

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

B.  $-2$

C.  $2$

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

**Answer: B**



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9. The value of  $\tan\left(-\frac{15\pi}{4}\right)$  is

A. -1

B. 1

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

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

**Answer:**



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**10.** The range of  $4 + 5 \cos x$  is

A.  $[-1, 9]$

B.  $(-1, 9]$

C.  $(-1, 9)$



D.  $[-1, 9)$

**Answer: A**

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11. The domain of  $2 \sin x \cos x$  is

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12. If  $x$  lies in III quadrant and  $\tan x = \frac{5}{12}$ , then  $\sin x$  and  $\cos x$  respectively are

A.  $\frac{5}{13}, \frac{12}{13}$

B.  $-\frac{5}{13}, \frac{12}{13}$

C.  $\frac{5}{13}, -\frac{12}{13}$

D.  $-\frac{5}{13}, -\frac{12}{13}$

**Answer: A**

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13. The value of  $2\sin^2\frac{\pi}{6} + \operatorname{cosec}^2\frac{7\pi}{6} \cdot \cos^2\frac{\pi}{3}$  is equal to

A. 1

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

C. -1

D. 2

**Answer: B**



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14. The value of

$$\cos\left(\frac{3\pi}{2} + x\right) \cdot \cos(2\pi + x) \left[ \cot\left(\frac{3\pi}{2} - x\right) + \cot(2\pi + x) \right]$$

is

A. -1

B. 0

C. 1

D. 2

**Answer: D**



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15. If  $\sin \theta + \operatorname{cosec} \theta = 2$ , then  $\sin^2 \theta + \operatorname{cosec}^2 \theta$  is equal to

A. 1

B. 4

C. 2

D. 6

**Answer: C**



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16. If  $f(x) = \cos^2 x + \sec^2 x$ , then

(i)  $f(x) < 1$

(ii)  $f(x) = 1$

(iii)  $2 < f(x) < 1$

(iv)  $f(x) \geq 2$

A.  $f(x) < 1$

B.  $f(x) = 1$

C.  $2 < f(x) < 1$

D.  $f(x) \geq 2$

**Answer:**

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17. If  $\tan \theta = \frac{1}{2}$  and  $\tan \phi = \frac{1}{3}$ , then the value of  $(\theta + \phi)$

is

A. 1.  $\frac{\pi}{6}$

B. 2.  $\pi$

C. 3. 0

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

**Answer: D**



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**18. Which of the following is not correct ?**

A. 1.  $\sin\theta = -\frac{1}{5}$

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

C. 3.  $\sec\theta = \frac{1}{2}$

D.  $4.\tan\theta = 20$

**Answer: C**

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19. The value of  $\cos 1^\circ \cdot \cos 2^\circ \cdot \cos 3^\circ \dots \cos 179^\circ$  is

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

B. 0

C. 1

D. -1

**Answer: B**

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20. The value of  $\tan 1^\circ \cdot \tan 2^\circ \cdot \tan 3^\circ \dots \tan 89^\circ$  is

A. 0

B. 1

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

D. 2

**Answer: B**



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21. The value of  $\tan 75^\circ - \cot 75^\circ$  is equal to



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

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

C.  $2 - \sqrt{3}$

D. 1

**Answer: A**



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**22. Which of the following is correct ?**

A.  $\sin 1^\circ > \sin 1$

B.  $\sin 1^\circ < \sin 1$

C.  $\sin 1^\circ = \sin 1$

$$D. \sin 1^\circ = \frac{\pi}{180} \sin 1$$

**Answer: B**

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**23.** The value of  $\tan 5A - \tan 3A - \tan 2A$  is equal to

A.  $\tan 5A \cdot \tan 3A \cdot \tan 2A$

B.  $-\tan 5A \cdot \tan 3A \cdot \tan 2A$

C.  $\tan 3A \cdot \tan 2A - \tan 2A \cdot \tan 5A - \tan 5A \cdot \tan 2A$

D. none of these

**Answer:**

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24. The value of  $\sin(45^\circ + \theta) - \cos(45^\circ - \theta)$  is

A.  $2 \cos \theta$

B.  $2 \sin \theta$

C. 1

D. 0

**Answer: D**

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25. The value of  $\cot\left(\frac{\pi}{4} + \theta\right) \cdot \cot\left(\frac{\pi}{4} - \theta\right)$  is

(i) -1

(ii) 0

(iii) 1

(iv) not defined

A.  $-1$

B. 0

C. 1

D. not defined

**Answer: C**



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**26.**  $\cos 2\theta \cdot \cos 2\phi + \sin^2(\theta - \phi) - \sin^2(\theta + \phi)$  is equal to

(i)  $\sin 2(\theta + \phi)$

(ii)  $\cos 2(\theta + \phi)$

(iii)  $\sin 2(\theta - \phi)$

(iv)  $\cos 2(\theta - \phi)$

A.  $\sin 2(\theta + \phi)$

B.  $\cos 2(\theta + \phi)$

C.  $\sin 2(\theta - \phi)$

D.  $\cos 2(\theta - \phi)$

**Answer: B**



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27. If for real  $x$ ,  $\cos \theta = x + \frac{1}{x}$ , then

- A.  $\theta$  is an acute angle
- B.  $\theta$  is a right angle
- C.  $\theta$  is an obtuse angle
- D. no value of  $\theta$  is possible

**Answer: D**



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28. If  $\tan A = \frac{1}{2}$ ,  $\tan B = \frac{1}{3}$ , then  $\tan(2A + B)$  is equal to

- A. 1
- B. 2

C. 3

D. 4

**Answer: C**



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**29.** If  $\alpha + \beta = \frac{\pi}{4}$ , then  $(1 + \tan\alpha)(1 + \tan\beta)$  is

A. 1

B. 2

C. -1

D. -2

**Answer: B**



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30. If  $\sin\theta = -\frac{4}{5}$  and  $\theta$  lies in third quadrant, then the value of  $\cos\frac{\theta}{2}$  is

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

B.  $-\frac{1}{\sqrt{10}}$

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

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

**Answer: C**



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**31.** The greatest value of  $\sin x \cdot \cos x$  is

A. 1

B. 2

C.  $\sqrt{2}$

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

**Answer: D**



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**32.**  $a \cos x + b \sin x$  lies between

A. a and b

B.  $-(a^2 + b^2)$  and  $(a^2 + b^2)$

C.  $-\sqrt{a^2 + b^2}$  and  $\sqrt{a^2 + b^2}$

D.  $-\sqrt{a + b}$  and  $\sqrt{a + b}$

**Answer: C**



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**33.** Number of solution of the equation  $\tan x + \sec x = 2 \cos x$  lying in the interval  $[0, 2\pi]$  is

A. 0

B. 1

C. 2

D. 3

**Answer: D**

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**34.**

if

$\cos x = -\frac{3}{5}$  and  $\pi < x < \frac{3\pi}{2}$ , then  $\frac{\operatorname{cosec} x + \cot x}{\sec x - \tan x}$  is

equal to

A. (a)  $\frac{1}{6}$

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

C. (c)  $-\frac{1}{6}$

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

**Answer: A**



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**35.** The value of  $\sin(\pi + x) \cdot \sin(\pi - x) \cdot \operatorname{cosec}^2 x$  is

A. 0

B. 1

C.  $-1$

D. 2

**Answer: C**



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36. The value of  $3\sin\frac{\pi}{6} \cdot \sec\frac{\pi}{3} - 4\sin\frac{5\pi}{6} \cdot \cot\frac{\pi}{4}$  is

(i) -1

(ii) 0

(iii) 1

(iv) 2

A. -1

B. 0

C. 1

D. 2

**Answer: C**



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37. If  $\sin \alpha = k \sin \beta$  then  $\tan\left(\frac{\alpha - \beta}{2}\right) \cdot \cot\left(\frac{\alpha + \beta}{2}\right)$  is equal to

A. (a)  $\frac{k - 1}{k + 1}$

B. (b)  $\frac{k + 1}{k - 1}$

C. (c)  $\frac{1 + k}{1 - k}$

D. (d)  $\frac{1 - k}{1 + k}$

**Answer: A**



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38. If  $\sin x = \frac{1}{3}$ , then the value of  $\sin 3x$  is

A. 1

B. 0

C.  $\frac{23}{27}$

D.  $-\frac{23}{27}$

**Answer: C**



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**39.** The value of  $\cos^2 48^\circ - \sin^2 12^\circ$  is

A.  $\frac{\sqrt{5} + 1}{8}$

B.  $\frac{\sqrt{5} - 1}{8}$

C.  $\frac{\sqrt{5} + 1}{4}$

D.  $\frac{\sqrt{5} - 1}{4}$

**Answer: A**

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40. The value of  $\cos \frac{2\pi}{15} \cdot \cos \frac{4\pi}{15} \cdot \cos \frac{8\pi}{15} \cdot \cos \frac{16\pi}{15}$  is

A. (a)  $-\frac{1}{16}$

B. (b)  $-\frac{1}{8}$

C. (c)  $\frac{1}{8}$

D. (d)  $\frac{1}{16}$

**Answer: D**

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41. The general solution of the equation

$$\tan\left(2x + \frac{\pi}{12}\right) = 0 \text{ is}$$

A.  $\frac{n\pi}{2} - \frac{\pi}{24}$

B.  $n\pi + \frac{\pi}{12}$

C.  $n\pi - \frac{\pi}{12}$

D.  $\frac{n\pi}{2} + \frac{\pi}{24}$

**Answer: A**



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42. The general solution of the equation

$$\sin^2 x \cdot \sec x + \sqrt{3} \tan x = 0 \text{ is}$$

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

B.  $n\pi$

C.  $n\pi + \frac{\pi}{6}$

D.  $n\pi - \frac{\pi}{6}$

**Answer: B**



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43. If  $A$  lies in the second quadrant and  $3 \tan A + 4 = 0$ ,

then the value of  $2 \cot A - 5 \cos A + \sin A$  is

A. (a)  $-\frac{53}{10}$

B. (b)  $\frac{23}{10}$

C. (c)  $\frac{37}{10}$

D. (d)  $\frac{7}{10}$

**Answer: B**



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**44.** If  $\tan \theta = \frac{a}{b}$ , then  $b \cos 2\theta + a \sin 2\theta$  is equal to

A. (a)  $a$

B. (b)  $b$

C. (c)  $\frac{a}{b}$

D. (d)  $\frac{b}{a}$

**Answer: B**



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