

IITJEE Foundation Practice paper

INTRODUCTION TO TRIGONOMETRY

class-10th-Mathematics Number of Questions: 59

For Answers and Solutions, Go to www.micromerits.com

1

If $3 \sin \theta = \sqrt{3} \cos \theta$ then value of $\tan 2\theta$ is

- $\sqrt{2}$ $\sqrt{3}$ $\frac{1}{\sqrt{3}}$ 1

2

Find the value of

$\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 80^\circ + \sin^2 85^\circ$ is

- 0 1 2 3

3

Find the value of $\cos 255^\circ + \sin 165^\circ$

- 2 0 1 $\sqrt{\frac{3}{2}}$

4

If $\operatorname{cosec} A + \cot A = \frac{2}{3}$ then find $\cos A$

- $\frac{5}{13}$ $\frac{13}{5}$ $\frac{-5}{13}$ $\frac{-13}{5}$

5

If $5 \sin x + 4 \cos x = 3$ then find

$4 \sin x - 5 \cos x$ is

- 4 $4\sqrt{2}$ $3\sqrt{2}$ $\sqrt{2}$

6

If $\sin x + \sin^2 x = 1$ then
 $\cos^8 x + 2 \cos^6 x + \cos^4 x =$

- 0 -1 1 2

7

If $x \sin(90^\circ - \theta) \cot(90^\circ - \theta) = \cos(90^\circ - \theta)$ then $x =$

- 0 1 -1 2

8

If $\frac{\cos^3 A + \sin^3 A}{\cos A + \sin A} + \frac{\cos^3 A - \sin^3 A}{\cos A - \sin A} = k$ then find k

- 0 1 2 -1

9

If $\tan 25^\circ = p$, then find $\frac{\tan 245^\circ + \tan 335^\circ}{\tan 205^\circ - \tan 115^\circ} =$

- $\frac{p^2 - 1}{1 + p^2}$ $\frac{1 + p^2}{p^2 - 1}$ $\frac{1 - p^2}{1 + p^2}$ $\frac{1 + p^2}{1 - p^2}$

10

If angles A, B, C of a $\triangle ABC$ forms an increasing A, P , then $\sin B =$

- $\frac{1}{2}$ $\frac{\sqrt{3}}{2}$ 1 $\frac{1}{\sqrt{2}}$

11

If $\sin \theta - \cos \theta = 0$, then the value of $\sin^4 \theta + \cos^4 \theta$ is

- $\frac{1}{4}$ $\frac{\sqrt{3}}{2}$ $\frac{1}{2}$ $\frac{1}{\sqrt{2}}$

12

Simplify $\sqrt{\frac{1 - \sin \theta}{1 + \sin \theta}} =$

- $\sec \theta - \tan \theta$ $\tan \theta - \sec \theta$ $\sec \theta + \tan \theta$ $\operatorname{cosec} \theta - \tan \theta$

13

If $\sin \theta = \frac{3}{5}$, find $(\tan \theta + \sec \theta)^2$

- 6 4 2 3

14

Simplify $\frac{\cos \theta}{1 - \sin \theta} + \frac{\cos \theta}{1 + \sin \theta} =$

- $2 \cdot \cot \theta$ $2 \cdot \tan \theta$ $2 \cdot \sec \theta$ $2 \cdot \sin \theta$

15

Find the value of $\sin 75^\circ$

- $\frac{\sqrt{3} + 1}{2\sqrt{2}}$ $\frac{\sqrt{3} - 1}{2\sqrt{2}}$ $\frac{\sqrt{3} - 1}{4}$ $\frac{\sqrt{3} + 1}{4}$

16

If $\tan 2A = \cot (A - 18^\circ)$, where $2A$ is an acute angle, then the value of $A =$

- 18° 36° 54° 9°

17

In a $\triangle ABC$ right angled at C , If $\tan A = \frac{1}{\sqrt{3}}$,
find the value of $\sin A \cos B + \cos A \sin B =$

3 2 1 0

18

If $\tan \theta + \frac{1}{\tan \theta} = 2$, find the value of $\tan^2 \theta + \frac{1}{\tan^2 \theta} =$

1 3 2 4

19

If A and B are supplementary angles then $\cos^2 A + \cos^2 B =$

0 $2\sin^2 B$ $2\cos^2 A$ $\cos^2 B$

20

If $\tan A = \frac{1}{3}$, $\tan B = \frac{2}{7}$ find $\cot (A - B) =$

23 32 $\frac{1}{23}$ $\frac{1}{32}$

21

If $A + C = B$ then find $\tan A \cdot \tan B \cdot \tan C$

$\tan B + \tan A + \tan C$ $\tan B - \tan A + \tan C$
 $\tan B + \tan A - \tan C$ $\tan B - \tan A - \tan C$

22

If $\sqrt{\sin x} + \cos x = 0$ then find $\sin x$

0 $\frac{\sqrt{5}-1}{2}$ $\frac{\sqrt{5}+1}{2}$ $\frac{1-\sqrt{5}}{2}$

23

If ABCD is a cyclic quadrilateral, the $\cos A + \cos B + \cos C + \cos D =$

0 -1 1 2

24

If $(\sin \alpha + \operatorname{cosec} \alpha)^2 + (\cos \alpha + \sec \alpha)^2 = k + \tan^2 \alpha + \cot^2 \alpha$
find the value of $k =$

25

If $9\cos^2 x + 4\sin^2 x = 5$ then find the value of $\tan x =$

- ± 1 ± 2 ± 3 ± 4

26

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

- 1 0 -1 2

27

The value of $\tan 10^\circ \cdot \tan 15^\circ \cdot \tan 75^\circ \cdot \tan 80^\circ$ is

- 1 0 1 2

28

Find the value of $\tan\left(\frac{\pi}{4} + \theta\right) \tan\left(\frac{3\pi}{4} + \theta\right)$

- 0 1 -1 $\frac{1}{\sqrt{3}}$

29

If θ does not lie in fourth quadrant, $\tan \theta = \frac{-4}{3}$, find

$5\sin \theta + 10\cos \theta + 9\sec \theta + 16\operatorname{cosec} \theta + 4\cot \theta =$

- 1 $\frac{2}{5}$ $\frac{4}{5}$ 0

30

If n is even

$\sin \theta + \sin (\pi + \theta) + \sin (2\pi + \theta) + \sin (3\pi + \theta) + \dots + (n \text{ terms}) =$

- 0 $-\sin \theta$ $\sin \theta$ $\cos \theta$

31

The co-tangents of the angles $\frac{\pi}{3}, \frac{\pi}{4}, \frac{\pi}{6}$ are in

- G.P. A.P H.P none

32

$$\sin^6 \theta + \cos^6 \theta =$$

- $1 - 3\sin^2 \theta \cdot \cos^2 \theta$ $1 + 2\sin^2 \theta \cdot \cos^2 \theta$ $1 + 4\sin^2 \theta \cdot \cos^2 \theta$
 $1 - \sin^2 \theta \cdot \cos^2 \theta$

33

If $x = a \sec^n \theta$; $y = b \tan^n \theta$ then $\left(\frac{x}{a}\right)^{\frac{2}{n}} - \left(\frac{y}{b}\right)^{\frac{2}{n}} =$

- 3 1 -1 4

34

$$\sqrt{1 - \sin^2 100^\circ} \sec 100^\circ =$$

- 1 -1 2 3

35

Find the value of

$$\log \tan 1^\circ \cdot \log \tan 2^\circ \cdot \log \tan 3^\circ \dots \dots \log \tan 89^\circ$$

- 1 0 1 $\frac{1}{2}$

36

Find the value of $1 - \frac{\sin^2 \theta}{1 + \cot \theta} - \frac{\cos^2 \theta}{1 + \tan \theta}$

- $\sin 3\theta$ $\sin \theta$ $\frac{1}{2} \sin 2\theta$ $\sin 2\theta$

37

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

- 0 $\pm\sqrt{2} \sin \theta$ $\pm\sqrt{2} \cos \theta$ 1

38

In a right angle $\triangle ABC$, right angle at B, the ratio of AB to AC is

$1 : \sqrt{2}$. Find the value of $\frac{2 \tan A}{1 + \tan^2 A}$

- 4 1 2 0

39

$$\sin^2 26^\circ + \sin^2 64^\circ =$$

- 2 0 1 -1

40

Find the value of $\tan 690^\circ$

- 1 $-\frac{1}{\sqrt{3}}$ $\frac{2}{\sqrt{3}}$ 0

41

Find the value of x , if $\sqrt{3} \tan 2x = \cos 60^\circ + \sin 45^\circ \cdot \cos 45^\circ$

- 15° 35° 25° 18°

42

$\frac{\tan \theta - \cot \theta}{\sin \theta \cdot \cos \theta}$ is equal to

- $\tan^2 \theta - \cot^2 \theta$ $\tan^2 \theta - \operatorname{cosec}^2 \theta$ $\sec^2 \theta + \operatorname{cosec}^2 \theta$ $\sec^2 \theta - \cot^2 \theta$

43

If θ is an acute angle and $\tan \theta + \cot \theta = 2$, find the value of $\tan^7 \theta + \cot^7 \theta$

- 4 0 2 5

44

ABC is a right angle triangle at C, if $\angle A = 30^\circ$ and $AB=40$ units, find the remaining two sides

- 20 units, 20 units $20\sqrt{3}$ units, 40 units $20\sqrt{3}$ units, 20 units
 20 units, 40 units

45

$\frac{1 + \sec \theta - \tan \theta}{1 + \sec \theta + \tan \theta}$ is equal to

- $\frac{1 + \cos \theta}{\sin \theta}$ $\frac{1 - \cos \theta}{\sin \theta}$ $\frac{1 + \sin \theta}{\cos \theta}$ $\frac{1 - \sin \theta}{\cos \theta}$

46

The altitude AD of a $\triangle ABC$ in which $\angle A$ obtuse and $AD = 10$ cm, if $BD = 10$ cm and $CD = 10\sqrt{3}$ cm, determine $\angle A$

- 125° 115° 135° 105°

47

If $x = y \cos \frac{2\pi}{3} = z \cos \frac{4\pi}{3}$ then $xy + yz + zx =$

- 0 2 4 3

48

If $\frac{2\sin \theta}{1 + \cos \theta + \sin \theta} = p$ then find $\frac{1 - \cos \theta + \sin \theta}{1 + \sin \theta}$

- $\frac{1}{p}$ p $2p$ $\frac{2}{p}$

49

If in a $\triangle ABC$, the angles A, B, C are in A.P. then

$$\frac{\sin A - \sin C}{\cos C - \cos A}$$

- $\cot B$ $\tan B$ $\cos B$ $\sin B$

50

$\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^\circ + \dots \dots \dots \sin^2 90^\circ =$

- $7\frac{1}{2}$ $8\frac{1}{2}$ $10\frac{1}{2}$ $9\frac{1}{2}$

51

If $0 < \alpha, \beta < \frac{\pi}{4}$,

$$\cos(\alpha + \beta) = \frac{4}{5}, \sin(\alpha - \beta) = \frac{5}{13}$$

then find $\tan 2\alpha$

- $\frac{33}{56}$ $\frac{56}{33}$ $\frac{16}{63}$ $\frac{63}{16}$

52

If $x = \tan A - \tan B, y = \cot B - \cot A$ then $\frac{1}{x} + \frac{1}{y}$

- $\cot (B - A)$ $\cot (A - B)$ $\tan (A - B)$ $\tan (B - A)$

53

If $A + B = 45^\circ$ then $(1 + \tan A)(1 + \tan B) =$

- 1 0 2 -1

54

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

- $\cos 2\alpha$ $\cos 2\beta$ $\cos \alpha$ $\sin \alpha$

55

If $\sin \theta + \cos \theta = p, \sin^3 \theta + \cos^3 \theta = q$ then $p(p^2 - 3) =$

- q 2q -q -2q

56

$\tan 5x - \tan 3x - \tan 2x =$

- $\tan 5x \cdot \tan 3x \cdot \tan 2x$ $\sin 5x \cdot \sin 3x \cdot \sin 2x$ $\cos 5x \cdot \cos 3x \cdot \cos 2x$
 $\cot 5x \cdot \cot 3x \cdot \cot 2x$

57

If $\sin \theta_1 + \sin \theta_2 + \sin \theta_3 = 3$ then

$\cos \theta_1 + \cos \theta_2 + \cos \theta_3 =$

- 3 2 1 0

58

If $x = a(\sec \theta + \tan \theta)^2, y = b(\sec \theta - \tan \theta)^2$

find $x^2 y^2$

- $ab \sec \theta$ $a^2 b^2 \tan \theta$ $a^2 b^4$ $a^2 b^2$

59

In a $\triangle ABC,$

$$\cos\left(\frac{B+2C+3A}{2}\right) + \cos\left(\frac{A-B}{2}\right) =$$

- 1 0 1 2

MicroMerits.com is an innovative practice and assessment platform. The methodical practice sharpens your talent.

We provide Practice worksheets and Practice papers based on CBSE syllabus. These printable Worksheets and Practice Papers are available for FREE download

Helps students to score very good marks in their board exams. Also useful for students taking part in various competitions like NTSE, Olympiads, KVPY and for future JEE/NEET exams

Micromerits.com