

Question Bank

TRIGONOMETRY MCQS

Class 11 - Mathematics

- If $\sec \theta = \sqrt{2}$ and $\frac{3\pi}{2} < \theta < 2\pi$, then $\frac{(1+\tan \theta + \operatorname{cosec} \theta)}{(1+\cot \theta - \operatorname{cosec} \theta)} = ?$ [1]
 - $\frac{-3}{8}$
 - 1
 - $\frac{3}{4}$
 - $\frac{\sqrt{3}}{2}$
- A pendulum swings through an angle of 42° in describing an arc of length 55 cm. The length of the pendulum is [1]
 - 88 cm
 - 60 cm
 - 56 cm
 - 75 cm
- $\cos 40^\circ + \cos 80^\circ + \cos 160^\circ + \cos 240^\circ =$ [1]
 - $\frac{1}{2}$
 - $\frac{-1}{2}$
 - 1
 - 0
- 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 [1]
 - 10
 - 9.5
 - 8
 - 7
- Mark the Correct alternative in the following: The value of $(\cot \frac{x}{2} - \tan \frac{x}{2})^2 (1 - 2 \tan x \cot 2x)$ is [1]
 - 5
 - 1
 - 4
 - 3
- If $x = r \cos \alpha \cos \beta$, $y = r \cos \alpha \sin \beta$ and $z = r \sin \alpha$, then $x^2 + y^2 + z^2 = ?$ [1]
 - r^4
 - 1
 - r^2
 - None of these
- Mark the Correct alternative in the following: $8 \sin \frac{x}{8} \cos \frac{x}{2} \cos \frac{x}{4} \cos \frac{x}{8}$ is equal to [1]
 - $\sin x$
 - $8 \cos x$
 - $\cos x$
 - $8 \sin x$
- $\tan 15^\circ = ?$ [1]
 - $\frac{(\sqrt{2}+1)}{(\sqrt{2}-1)}$
 - $\frac{(\sqrt{3}+1)}{(\sqrt{3}-1)}$
 - $\frac{(\sqrt{3}-1)}{(\sqrt{3}+1)}$
 - $\frac{(\sqrt{2}-1)}{(\sqrt{2}+1)}$
- The value of $\cos 1^\circ \cos 2^\circ \cos 3^\circ \dots \cos 179^\circ$ is [1]
 - $\frac{1}{\sqrt{2}}$
 - 1
 - 1
 - 0
- If $\sin \alpha + \sin \beta = a$ and $\cos \alpha - \cos \beta = b$, then $\tan \frac{\alpha - \beta}{2} =$ [1]

- a) None of these
c) $\sqrt{a^2 + b^2}$
- b) $-\frac{b}{a}$
d) $-\frac{a}{b}$
11. $(\sin^2 6x - \sin^2 4x) = ?$ [1]
a) $\sin 10x \sin 2x$
c) $\sin 2x$
b) None of these
d) $\sin 10x$
12. If $\alpha + \beta = \frac{\pi}{4}$, then the value of $(1 + \tan \alpha)(1 + \tan \beta)$ is [1]
a) 1
c) -2
b) 2
d) Not defined
13. The value of $\cos^2\left(\frac{\pi}{6} + x\right) - \sin^2\left(\frac{\pi}{6} - x\right)$ is [1]
a) 0
c) $-\frac{1}{2} \cos 2x$
b) $\frac{1}{2} \cos 2x$
d) $\frac{1}{2}$
14. $2 \sin \frac{5\pi}{12} \cos \frac{\pi}{12} = ?$ [1]
a) $\frac{(2+\sqrt{3})}{2}$
c) $\frac{\sqrt{3}+1}{2}$
b) $\frac{\sqrt{3}}{2}$
d) $\frac{1}{2}$
15. $\sin 15^\circ = ?$ [1]
a) $\frac{\sqrt{3}}{2\sqrt{2}}$
c) $\frac{(\sqrt{3}-1)}{2\sqrt{2}}$
b) $\frac{(\sqrt{2}-1)}{\sqrt{2}}$
d) $\frac{(\sqrt{3}+1)}{2\sqrt{2}}$
16. The minute hand of a watch is 1.4 cm long. How far does its tip move in 45 minutes? [1]
a) 6 cm
c) 6.3 cm
b) 6.6 cm
d) 7 cm
17. If a $\tan \theta = b$, then $\left(\frac{b \sin \theta - a \cos \theta}{b \sin \theta + a \cos \theta}\right) = ?$ [1]
a) $\frac{(b^2 - a^2)}{(b^2 + a^2)}$
c) None of these
b) $\frac{(a^2 - b^2)}{(a^2 + b^2)}$
d) $\frac{(a^2 + b^2)}{(a^2 - b^2)}$
18. 25° when measured in radians is [1]
a) $\left(\frac{5\pi}{36}\right)^c$
c) $\left(\frac{5\pi}{24}\right)^c$
b) None of these
d) $\left(\frac{5\pi}{18}\right)^c$
19. $\operatorname{cosec}(-1110^\circ) = ?$ [1]
a) -2
c) 2
b) $\frac{-2}{\sqrt{3}}$
d) $\frac{2}{\sqrt{3}}$
20. The value of $\sin(45^\circ + \theta) - \cos(45^\circ - \theta)$ is [1]
a) 0
c) 1
b) $2 \sin \theta$
d) $2 \cos \theta$

21. $\cos 36^\circ = ?$ [1]
 a) $\frac{(\sqrt{3}-1)}{2}$ b) $\frac{(\sqrt{3}+1)}{2}$
 c) $\frac{(\sqrt{5}+1)}{4}$ d) $\frac{(\sqrt{5}-1)}{4}$
22. The minimum value of $3 \cos x + 4 \sin x + 8$ is [1]
 a) 5 b) 9
 c) 3 d) 7
23. Which is greater, $\sin 24^\circ$ or $\cos 24^\circ$? [1]
 a) both are equal b) $\cos 24^\circ$
 c) $\sin 24^\circ$ d) cannot be compared
24. $\frac{\cos 8^\circ - \sin 8^\circ}{\cos 8^\circ + \sin 8^\circ} = ?$ [1]
 a) $\tan 52^\circ$ b) $\tan 37^\circ$
 c) None of these d) $\tan 8^\circ$
25. If $\sin x = \frac{-1}{2}$ and x lies in quadrant IV, then $\sin \frac{x}{2} = ?$ [1]
 a) $\frac{\sqrt{3+\sqrt{2}}}{2}$ b) $\frac{\sqrt{2-\sqrt{3}}}{2}$
 c) None of these d) $\frac{\sqrt{2+\sqrt{3}}}{2}$
26. $(2 \cos^2 15^\circ - 1) = ?$ [1]
 a) $\frac{\sqrt{3}}{2}$ b) $\frac{\sqrt{3}}{\sqrt{2}}$
 c) $\frac{3}{2}$ d) $2\sqrt{3}$
27. $\sin \theta \left(\frac{\sin \theta}{1+\cos \theta} + \frac{1+\cos \theta}{\sin \theta} \right) = ?$ [1]
 a) 1 b) 4
 c) 2 d) 3
28. The value of $\cos \frac{\pi}{5} \cos \frac{2\pi}{5} \cos \frac{4\pi}{5} \cos \frac{8\pi}{5}$ is [1]
 a) 0 b) $\frac{-1}{8}$
 c) $\frac{1}{16}$ d) $\frac{-1}{16}$
29. If $\sin (B + C - A)$, $\sin (C + A - B)$, $\sin (A + B - C)$ are in A.P., then $\cot A$, $\cot B$, $\cot C$ are in [1]
 a) GP b) None of these
 c) HP d) AP
30. $\cos 405^\circ = ?$ [1]
 a) $\frac{-1}{\sqrt{2}}$ b) $-\sqrt{2}$
 c) $\sqrt{2}$ d) $\frac{1}{\sqrt{2}}$
31. If $\tan A + \cot A = 4$, then $\tan^4 A + \cot^4 A$ is equal to [1]
 a) 191 b) 194
 c) 110 d) 80

32. 162° when measured in radians [1]
- a) $\left(\frac{9\pi}{10}\right)^c$ b) $\left(\frac{7\pi}{10}\right)^c$
 c) $\left(\frac{4\pi}{3}\right)^c$ d) $\left(\frac{5\pi}{4}\right)^c$
33. $\cos 135^\circ = ?$ [1]
- a) $\frac{1}{\sqrt{2}}$ b) $\frac{-1}{2}$
 c) $\frac{1}{2}$ d) $\frac{-1}{\sqrt{2}}$
34. The value of $\cos^4 x + \sin^4 x - 6 \cos^2 x \sin^2 x$ is [1]
- a) None of these b) $\cos 4x$
 c) $\cos 2x$ d) $\sin 2x$
35. $\cos 72^\circ = ?$ [1]
- a) $\frac{(\sqrt{5}+1)}{4}$ b) $\frac{(\sqrt{5}-1)}{4}$
 c) $\frac{(2-\sqrt{5})}{3}$ d) $\frac{(2+\sqrt{5})}{3}$
36. Mark the correct , alternative in the following: If $\cos x = \frac{1}{2}\left(a + \frac{1}{a}\right)$ and $\cos 3x = \lambda\left(a^3 + \frac{1}{a^3}\right)$ then $\lambda =$ [1]
- a) $\frac{1}{4}$ b) 1
 c) $\frac{1}{2}$ d) None of these
37. Find the value of $\cot\left(\frac{29\pi}{4}\right)$. [1]
- a) $\frac{1}{\sqrt{3}}$ b) -1
 c) $\sqrt{3}$ d) 1
38. Find the value of $\sec\left(\frac{-19\pi}{3}\right)$. [1]
- a) $\frac{1}{2}$ b) -2
 c) 2 d) $\frac{-1}{2}$
39. If $\sin \theta = \frac{15}{17}$ and $\cos \phi = \frac{12}{13}$, where θ and ϕ both lie in quadrant I, then $\sin(\theta + \phi) = ?$ [1]
- a) $\frac{171}{221}$ b) $\frac{181}{221}$
 c) $\frac{180}{221}$ d) $\frac{220}{221}$
40. The radius of the circle whose arc of length 15π cm makes an angle of $3n/4$ radian at the centre is [1]
- a) 20 cm b) $11\frac{1}{4}$ cm
 c) $22\frac{1}{2}$ cm d) 10 cm
41. If $A = 2 \sin^2 x - \cos 2x$, then A lies in the interval [1]
- a) [-2, 4] b) None of these
 c) [-1, 3] d) [1, 2]
42. If $\tan 69^\circ + \tan 66^\circ - \tan 69^\circ \tan 66^\circ = 2k$, then $k =$ [1]
- a) $\frac{1}{2}$ b) $-\frac{1}{2}$
 c) -1 d) None of these

43. $\frac{\cos 6x + \cos 4x}{\sin 6x - \sin 4x} = ?$ [1]
 a) $-\tan x$ b) $\cot x$
 c) $\tan x$ d) $-\cot x$
44. The value of $\sin 50^\circ - \sin 70^\circ + \sin 10^\circ$ is equal to [1]
 a) 2 b) 0
 c) $\frac{1}{2}$ d) 1
45. The value of $\cos 52^\circ + \cos 68^\circ + \cos 172^\circ$ is [1]
 a) 0 b) $\frac{3}{2}$
 c) 1 d) 2
46. If $\sin \alpha = \sin \beta$ and $\cos \alpha = \cos \beta$, then [1]
 a) $\sin(\alpha + \beta) = 0$ b) $\cos(\alpha + \beta) = 0$
 c) $\sin(\alpha - \beta) = 0$ d) $\cos(\alpha - \beta) = 0$
47. If $\sin x = \frac{1}{3}$, then $\sin 3x = ?$ [1]
 a) $\frac{1}{9}$ b) $\frac{23}{27}$
 c) 1 d) $\frac{7}{9}$
48. The greatest value of $\sin x \cos x$ is [1]
 a) $\frac{1}{\sqrt{2}}$ b) $\frac{\sqrt{3}}{2}$
 c) $\frac{1}{2}$ d) 1
49. If $(2^n + 1)x = \pi$, then $2^n \cos x \cos 2x \cos 2^2x \dots \cos 2^{n-1}x =$ [1]
 a) 1 b) $\frac{1}{2}$
 c) -1 d) None of these
50. The value of $\sin 20^\circ \sin 40^\circ \sin 60^\circ \sin 80^\circ$ is [1]
 a) $\frac{-3}{16}$ b) $\frac{3}{16}$
 c) $\frac{1}{16}$ d) $\frac{5}{16}$
51. A wheel makes 180 revolutions in 1 minute. How many radians does it turn in 1 second? [1]
 a) $(6\pi)^c$ b) $(12\pi)^c$
 c) $(3\pi)^c$ d) $(4\pi)^c$
52. If $\cot \theta = \frac{-12}{5}$ and θ lies in II quadrant, then $\frac{(1 + \sin \theta - \cos \theta)}{(1 - \sin \theta + \cos \theta)} = ?$ [1]
 a) $\frac{-13}{4}$ b) $\frac{15}{2}$
 c) $\frac{-15}{2}$ d) $\frac{13}{4}$
53. A circular wire of radius 7 cm is cut and bent again into an arc of a circle of radius 12 cm. The angle subtended by the arc at the centre is [1]
 a) 100° b) 210°
 c) 50° d) 60°

54. $\sin^2 \frac{\pi}{18} + \sin^2 \frac{\pi}{9} + \sin^2 \frac{7\pi}{18} + \sin^2 \frac{4\pi}{9}$ is equal to [1]
 a) 4 b) 2
 c) 0 d) 1
55. $\cos 50^\circ \cos 10^\circ - \sin 50^\circ \sin 10^\circ = ?$ [1]
 a) $\frac{\sqrt{3}}{2}$ b) $\frac{1}{2}$
 c) 1 d) $\frac{1}{\sqrt{2}}$
56. Write the value of $\operatorname{cosec} \left(\frac{-33\pi}{4} \right)$ [1]
 a) $\sqrt{2}$ b) $-\sqrt{2}$
 c) $\frac{-1}{\sqrt{2}}$ d) $\frac{1}{\sqrt{2}}$
57. If the arcs of the same length in two circles subtend angles 65° and 110° at the centre, then the ratio of the radii of the circles is [1]
 a) 22 :13 b) 22 :15
 c) 21 :13 d) 11 :13
58. The angle between the minute and hour hands of a clock at 8:30 is [1]
 a) 60° b) 75°
 c) 80° d) 105°
59. $\sqrt{\frac{1+\sin x}{1-\sin x}} = ?$ [1]
 a) $\cot \frac{x}{2}$ b) $\tan \frac{x}{2}$
 c) $\tan \left(\frac{\pi}{4} + \frac{x}{2} \right)$ d) $\cot \left(\frac{\pi}{4} + \frac{x}{2} \right)$
60. If $\cos x = \frac{-\sqrt{15}}{4}$ and $\frac{\pi}{2} < x < \pi$, then $\sin x = ?$ [1]
 a) $\frac{-1}{4}$ b) $\frac{1}{4}$
 c) $\frac{3}{4}$ d) $\frac{-3}{4}$
61. If $\cos \theta = \frac{4}{5}$ and $\cos \phi = \frac{12}{13}$, where θ and ϕ both lie in quadrant IV, then $\sin (\theta + \phi) = ?$ [1]
 a) $\frac{16}{65}$ b) $\frac{-16}{65}$
 c) $\frac{-33}{65}$ d) $\frac{-56}{65}$
62. In a right $\triangle ABC$, we have: $\sin^2 A + \sin^2 B + \sin^2 C = ?$ [1]
 a) 2 b) 3
 c) 0 d) 1
63. Mark the Correct alternative in the following: If in a $\triangle ABC$, $\tan A + \tan B + \tan C = 0$, then $\cot A \cot B \cot C =$ [1]
 a) 6 b) $\frac{1}{6}$
 c) None of these d) 1
64. If $\cos \theta = \frac{-3}{5}$ and $\pi < \theta < \frac{3\pi}{2}$, then $\frac{(\operatorname{cosec} \theta + \cot \theta)}{(\sec \theta - \tan \theta)} = ?$ [1]
 a) $\frac{2}{3}$ b) $\frac{1}{3}$

- c) $\frac{3}{2}$ d) $\frac{1}{6}$
65. If $\tan \theta + \cot \theta = 2$, then $\sin \theta = ?$ [1]
 a) $\frac{1}{\sqrt{3}}$ b) $\frac{1}{\sqrt{2}}$
 c) $\frac{1}{2}$ d) $\frac{\sqrt{3}}{2}$
66. The angle between the hour hand and the minute hand of a clock at half past three is [1]
 a) 54° b) 72°
 c) 75° d) 63°
67. 11° in degree [1]
 a) 372° b) 630°
 c) 315° d) 418°
68. If $\sin x = \frac{-2\sqrt{6}}{5}$ and x lies in quadrant III, then $\cot x = ?$ [1]
 a) $\frac{3}{2\sqrt{6}}$ b) $\frac{1}{2\sqrt{6}}$
 c) $\frac{-1}{2\sqrt{6}}$ d) $\frac{-3}{2\sqrt{6}}$
69. $\sin(180 + \phi) \sin(180 - \phi) \operatorname{cosec}^2 \phi$ [1]
 a) 1 b) -1
 c) 0 d) none of these
70. $\cos \frac{2\pi}{3} \cos \frac{\pi}{4} - \sin \frac{2\pi}{3} \sin \frac{\pi}{4} = ?$ [1]
 a) $\frac{-(\sqrt{3}+1)}{\sqrt{2}}$ b) $\frac{(\sqrt{3}+1)}{\sqrt{2}}$
 c) $\frac{(\sqrt{3}+1)}{2\sqrt{2}}$ d) $\frac{-(\sqrt{3}+1)}{2\sqrt{2}}$
71. The value of $\cos^2 48^\circ - \sin^2 12^\circ$ is [1]
 [Hint: Use $\cos^2 A - \sin^2 B = \cos(A + B) \cos(A - B)$]
 a) $\frac{\sqrt{5}-1}{8}$ b) $\frac{\sqrt{5}+1}{5}$
 c) $\frac{\sqrt{5}+1}{8}$ d) $\frac{\sqrt{5}+1}{2\sqrt{2}}$
72. $\cos 15^\circ = ?$ [1]
 a) $\frac{(\sqrt{3}+1)}{\sqrt{2}}$ b) $\frac{(\sqrt{3}+1)}{2\sqrt{2}}$
 c) $\frac{(\sqrt{3}-1)}{2\sqrt{2}}$ d) $\frac{(\sqrt{3}-1)}{\sqrt{2}}$
73. $\tan\left(\frac{-16\pi}{3}\right) = ?$ [1]
 a) $\frac{1}{\sqrt{3}}$ b) $\frac{-1}{\sqrt{3}}$
 c) $-\sqrt{3}$ d) $\sqrt{3}$
74. $\left(\tan \frac{\pi}{20} \tan \frac{3\pi}{20} \tan \frac{5\pi}{20} \tan \frac{7\pi}{20} \tan \frac{9\pi}{20}\right) = ?$ [1]
 a) $\frac{1}{2}$ b) -1
 c) 1 d) None of these

75. $\tan\left(\frac{-25\pi}{3}\right) = ?$

a) $\sqrt{3}$

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

b) $\frac{1}{\sqrt{3}}$

d) $-\sqrt{3}$