

Trigonometric Functions

Multiple Choice Questions

- 1 If $f(x) = \tan x$ then $f\left(\frac{\pi}{4}\right)$ is equal to :
(a) 0 (b) $\sqrt{3}$ (c) 1 (d) ∞
- 2 Degree measure of angle $\frac{\pi}{3}$ is :
(a) 30° (b) 100° (c) 60° (d) 45°
- 3 Radian measure of angle 210° is :
(a) $\frac{2\pi}{3}$ (b) $\frac{3\pi}{2}$ (c) $\frac{7\pi}{6}$ (d) $\frac{6\pi}{7}$
- 4 $\cos^2 x - \sin^2 x$ is equal to :
(a) 0 (b) 1 (c) $\sin 2x$ (d) $\cos 2x$
- 5 If $\sin x = \frac{3}{5}$ then $\cos x$ is equal to :
(a) $\frac{5}{4}$ (b) $\frac{4}{5}$ (c) $\frac{3}{5}$ (d) $\frac{5}{3}$
- 6 $\tan(180^\circ + x)$ is equal to :
(a) $\tan x$ (b) $-\tan x$ (c) $\cot x$ (d) $-\cot x$
- 7 Which of the following is false ?
(a) $\sin x \in [-1, 1]$ (b) $\cos x \in (0, 1)$ (c) $\tan x \in \mathbb{R}$ (d) $\sec x \notin (-1, 1)$
- 8 $\tan(45^\circ - x)$ is equal to :
(a) $\frac{1+\tan x}{1-\tan x}$ (b) $\frac{2\tan x}{1-\tan^2 x}$ (c) $\frac{1-\tan x}{1+\tan x}$ (d) $\frac{2\tan x}{1+\tan^2 x}$
- 9 $\sin \frac{x}{2}$ is equal to :
(a) $\sqrt{\frac{1+\cos x}{2}}$ (b) $\sqrt{\frac{1-\cos x}{2}}$ (c) $\frac{\sqrt{1-\cos x}}{2}$ (d) none of these
- 10 If in $\triangle ABC$ $\angle A = 35^\circ$ and $\angle B = 55^\circ$ then $\cos(\angle C)$ is equal to :
(a) 1 (b) 0 (c) -1 (d) none of these
- 11 $\sin 18^\circ$ is equal to :
(a) $\frac{\sqrt{10-2\sqrt{5}}}{4}$ (b) $\frac{\sqrt{10+2\sqrt{5}}}{4}$ (c) $\frac{\sqrt{5}+1}{4}$ (d) $\frac{\sqrt{5}-1}{4}$

4 and 6 Marks Questions

1. Find the radian measure of the following angles : $300^\circ, -48^\circ 30', 125^\circ, 40^\circ 20'$
2. Find the degree measure of the following angles : $11, -4, \frac{18\pi}{5}, \frac{2}{3}$
3. Find the degree measure of the angle subtended at the centre of a circle of radius 50cm by an arc of length 20cm.
4. Find the values of other five trigonometric functions in each of the following :
 - (i) $\cot \theta = \frac{12}{5}$, where θ lies in the third quadrant.
 - (ii) $\sec x = \frac{5}{4}$, where x lies in the fourth quadrant.
5. Find the values of the following : $\sin(-1200^\circ), \cos(1755^\circ), \tan(1845^\circ), \cot(-1125^\circ)$.

6. Prove that :

(i) $\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ = \frac{1}{16}$

(ii) $\cos 10^\circ \cos 50^\circ \cos 60^\circ \cos 70^\circ = \frac{\sqrt{3}}{16}$

(iii) $\frac{\sin 8x \cos x - \cos 3x \sin 6x}{\cos 2x \cos x - \sin 3x \sin 4x} = \tan 2x$

(iv) $2 \cos x = \sqrt{2 + \sqrt{2 + 2 \cos 4x}}$

(v) $\cos x \cos 2x \cos 4x \cos 8x = \frac{\sin 16x}{16 \sin x}$

(vi) $\frac{\cos 11^\circ + \sin 11^\circ}{\cos 11^\circ - \sin 11^\circ} = \tan 56^\circ$

7. Prove that $\sin 18^\circ = \frac{\sqrt{5}-1}{4}$ and hence find the values of $\cos 18^\circ$, $\tan 18^\circ$.

8. Find $\sin x/2$, $\cos x/2$, $\tan x/2$ in each of the following :

(i) $\cos x = -\frac{3}{5}$, x lies in the second quadrant.

(ii) $\tan x = -\frac{5}{12}$, x lies in the fourth quadrant.

(iii) $\operatorname{cosec} x = -4$, x lies in the third quadrant.

Prepared By : Vaibhav(Lecturer Maths), Govt. Multipurpose Sec. School, Patiala.