



Trigonometry

TIME: 1hr

MM: 45

General Instructions:

- All Questions are compulsory.
- Marks are given alongwith the questions individually.
- Use of calculator is not permitted.

- Q.1 Given $\tan A = \frac{4}{3}$, find the other trigonometric ratios of the angle A.
- Q.2 In a right triangle ABC, right-angled at B, if $\tan A = 1$, then verify that $2 \sin A \cos A = 1$.
- Q.3 In ΔOPQ , right-angled at P, $OP = 7$ cm and $OQ - PQ = 1$ cm. Determine the values of $\sin Q$ and $\cos Q$.
- Q.4 In ΔABC , right-angled at B, $AB = 24$ cm, $BC = 7$ cm. Determine:
(i) $\sin A$, $\cos A$
(ii) $\sin C$, $\cos C$
- Q.5 If $\angle A$ and $\angle B$ are acute angles such that $\cos A = \cos B$, then show that $\angle A = \angle B$.
- Q.6 If $\cot \theta = \frac{7}{8}$, evaluate: (i) $\frac{(1 + \sin \theta)(1 - \sin \theta)}{(1 + \cos \theta)(1 - \cos \theta)}$
- Q.7 In triangle ABC, right-angled at B, if $\tan A = \frac{1}{\sqrt{3}}$, find the value of :
(i) $\sin A \cos C + \cos A \sin C$
(ii) $\cos A \cos C - \sin A \sin C$
- Q.8 In ΔABC , right angled at B, $AB = 5$ cm and $\angle ACB = 30^\circ$ Determine the lengths of the sides BC and AC.
- Q.9 In ΔPQR , right - angled at Q, $PQ = 3$ cm and $PR = 6$ cm. Determine $\angle QPR$ and $\angle PRQ$.
- Q.10 If $\sin(A-B) = \frac{1}{2}$, $\cos(A+B) = \frac{1}{2}$, $0^\circ < A+B \leq 90^\circ$, $A > B$, find A and B
- Q.11 Evaluate the following:
$$\frac{5 \cos^2 60^\circ + 4 \sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$$
- Q.12 Choose the correct option and justify your choice:
 $\frac{2 \tan 30^\circ}{1 + \tan^2 30^\circ}$, (A) $\sin 60^\circ$ (B) $\cos 60^\circ$ (C) $\tan 60^\circ$ (D) $\sin 30^\circ$
- Q.13 If $\sin 3A = \cos(A - 26^\circ)$, where $3A$ is an acute angle, find the value of A.
- Q.14 Show that $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ = 1$.
- Q.15. If A, B and C are interior angles of a triangle ABC, then show that
$$\sin\left(\frac{B+C}{2}\right) = \cos\frac{A}{2}$$