

DYA SHREE ACADEI SR. SEC. SCHOOL



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Subject - Maths.

Class- 10th

Topic – Ch. 6 Trigonometric Ratios

Solve the following exercise

EXERCISE 6.1

Find the values of the following:

- 1. 2 sin 45° . cos 45°
- 2. cos 45° cos 60° sin 45° sin 60°
- 3. $\sin^2 30^\circ + 2 \cos^2 45^\circ + 3 \tan^2 60^\circ$
- 4. $3 \sin 60^{\circ} 4 \sin^{3}60^{\circ}$
- $5\cos^2 60^\circ + 4\sin^2 30^\circ \tan^2 45^\circ$ $\sin^2 30^\circ + \cos^2 45^\circ$
- $4\cot^2 45^\circ \sec^2 60^\circ + \sin^2 60^\circ + \cos^2 90^\circ$
- 7. $\frac{4}{\cot^2 30^\circ} + \frac{1}{\sin^2 30^\circ} \cos^2 45^\circ$
- $\frac{\tan^2 60^\circ + 4\sin^2 45^\circ + \sin^2 90^\circ}{3\sec^2 30^\circ + \csc^2 60^\circ \cot^2 30^\circ}$
- $\frac{\sin 30^{\circ} \sin 90^{\circ} + 2\cos 0^{\circ}}{\tan 30^{\circ} \cdot \tan 60^{\circ}}$
- 11. Find the value of x in the following:
 - (i) $\cos x = \cos 60^{\circ} \cos 30^{\circ} + \sin 60^{\circ} \sin 30^{\circ}$
 - (ii) $\sin 2x = \sin 60^{\circ} \cos 30^{\circ} \cos 60^{\circ} \sin 30^{\circ}$
 - (iii) $\sqrt{3} \tan 2x = \sin 30^\circ + \sin 45^\circ \cos 45^\circ + 2 \sin 90^\circ$

Prove that:

12.
$$\frac{\cos 30^\circ + \sin 60^\circ}{1 + \cos 60^\circ + \sin 30^\circ} = \frac{\sqrt{3}}{2}$$

13.
$$4 \cot^2 45^\circ - \sec^2 60^\circ - \sin^2 30^\circ = -\frac{1}{4}$$

14.
$$\sin 30^{\circ} \sin^2 60^{\circ} + 3\cos 60^{\circ} \tan 45^{\circ} = 2\sec^2 45^{\circ} - \csc^2 90^{\circ}$$

15.
$$\csc^2 45^\circ$$
 . $\sec^2 30^\circ \sin^3 90^\circ \cos 60^\circ = \frac{4}{3}$

16.
$$\frac{\sin 60^{\circ} + \sin 30^{\circ}}{\sin 60^{\circ} - \sin 30^{\circ}} = \frac{\tan 60^{\circ} + \tan 45^{\circ}}{\tan 60^{\circ} - \tan 45^{\circ}}$$

17.
$$2(\cos^2 45^\circ + \tan^2 60^\circ) - 6(\sin^2 45^\circ - \tan 30^\circ) = 6$$

18.
$$(\sec^2 30^\circ + \csc^2 45^\circ)$$
 (2 cos 60° + sin 90° + tan 45°) = 10

19.
$$(1 - \sin 45^\circ + \sin 30^\circ)(1 + \cos 45^\circ + \cos 60^\circ) = \frac{7}{4}$$

20.
$$\cos^2 0^\circ - 2 \cot^2 30^\circ + 3 \csc^2 90^\circ = 2(\sec^2 45^\circ - \tan^2 60^\circ)$$

21. If
$$x = 30^{\circ}$$
, then prove that

(i)
$$\sin 3x = 3 \sin x - 4 \sin^3 x$$

(ii)
$$\tan 2x = \frac{2\tan x}{1 - \tan^2 x}$$

(iii)
$$\sin x = \sqrt{\frac{1 - \cos 2x}{2}}$$

(iv)
$$\cos 3x = 4 \cos^3 x - 3 \cos x$$