

Chapter 8 Trigonometry

ਤਿਕੋਣਮਿਤੀ

1. ਤਿਕੋਣ ਮਿਤਈ ਅਨੁਪਾਤ (Trigonometric Ratios)

$$\operatorname{cosec} \theta = \frac{1}{\sin \theta} \text{ i.e. } \sin \theta \cdot \operatorname{cosec} \theta = 1$$

$$\sec \theta = \frac{1}{\cos \theta} \text{ i.e. } \cos \theta \cdot \sec \theta = 1$$

$$\cot \theta = \frac{1}{\tan \theta} \text{ i.e. } \tan \theta \cdot \cot \theta = 1$$

$$\tan \theta = \frac{\sin \theta}{\cos \theta}, \cot \theta = \frac{\cos \theta}{\sin \theta}$$

2. ਤਿਕੋਣਮਿਤਈ ਪੂਰਕ ਅਨੁਪਾਤ (Trigonometric Complementary Ratios)

- $\sin \theta = \cos (90 - \theta)$
- $\cos \theta = \sin (90 - \theta)$
- $\tan \theta = \cot (90 - \theta)$
- $\cot \theta = \tan (90 - \theta)$
- $\sec \theta = \operatorname{cosec} (90 - \theta)$
- $\operatorname{cosec} \theta = \sec (90 - \theta)$

3. ਤਿਕੋਣਮਿਤਈ ਟੇਬਲ (Trigonometric Table)

	0°	30°	45°	60°	90°
$\sin \theta$	0	1	2	3	4
$\cos \theta$	4	3	2	1	0

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$$\sin 60^\circ = \frac{\sqrt{3}}{2}, \cos 45^\circ = \frac{1}{\sqrt{2}}, \tan 45^\circ = 1$$

4. ਤਿਕੋਣਮਿਤਈ ਸਰਬਸਮਤਾਵਾਂ (Trigonometric Identities)

- $\sin^2 \theta + \cos^2 \theta = 1$
- $\sec^2 \theta - \tan^2 \theta = 1$
- $\operatorname{cosec}^2 \theta - \cot^2 \theta = 1$

5. ਜੇ $\sin A = \sin B, \cos A = \cos B, \tan A = \tan B$ ਤਾਂ $A = B$

(ਭਾਵ ਜੇ ਤਿਕੋਣਮਿਤਈ ਅਨੁਪਾਤ ਬਰਾਬਰ ਤਾਂ ਕੋਣ ਵੀ ਬਰਾਬਰ) i.e. If T-Ratios are equal then angles are also equal.

6. ਜੇ $\sin A = \cos B, \tan A = \cot B, \sec A = \operatorname{cosec} B$ ਤਾਂ $A + B = 90^\circ$,

ਭਾਵ ਜੇ ਤਿਕੋਣਮਿਤਈ ਅਨੁਪਾਤ ਪੂਰਕ ਹੋਣ ਤਾਂ ਕੋਣ ਵੀ ਪੂਰਕ ਹੁੰਦੇ ਹਨ।

i.e. If T-Ratios are complementary then angles are also complementary.

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ਤਿਕੋਣਮਿਤੀ

1. $\tan\theta = \frac{\sin\theta}{\dots\dots}$

- a) $\cot\theta$ b) $\cos\theta$ c) $\sec\theta$ d) $\operatorname{cosec}\theta$

2. $\operatorname{cosec}\theta = \frac{1}{\dots\dots}$

- a) $\sin\theta$ b) $\cos\theta$ c) $\sec\theta$ d) $\tan\theta$

3. $\cos\theta \cdot \sec\theta =$

- a) 0 b) 2 c) $\sin\theta$ d) 1

4. $\tan\theta \times \dots\dots = 1$

- a) $\cos\theta$ b) $\cot\theta$ c) $\sin\theta$ d) $\sec\theta$

5. ਦਿੱਤੇ ਚਿੱਤਰ ਵਿੱਚ $\cos\theta =$ In the given figure, $\cos\theta =$

- a) $\frac{5}{13}$ b) $\frac{13}{12}$ c) $\frac{12}{13}$ d) $\frac{13}{5}$

6. ਦਿੱਤੇ ਚਿੱਤਰ ਵਿੱਚ $\tan A =$ In the given figure, $\tan A =$

- a) $\frac{4}{3}$ b) $\frac{3}{4}$ c) $\frac{4}{5}$ d) $\frac{5}{4}$

7. $\triangle PQR$ ਵਿੱਚ $Q = 90^\circ$, $PQ = 6\text{ cm}$, $PR = 10\text{ cm}$ ਤਾਂ $\cot R =$

In $\triangle PQR$, $Q = 90^\circ$, $PQ = 6\text{ cm}$, $PR = 10\text{ cm}$ then $\cot R =$

- a) $\frac{3}{4}$ b) $\frac{4}{5}$ c) $\frac{4}{3}$ d) $\frac{3}{5}$

8. ਦਿੱਤੇ ਚਿੱਤਰ ਵਿੱਚ $\cos^2\theta + \sin^2\theta =$ In given figure, $\cos^2\theta + \sin^2\theta =$

- a) 0 b) 1 c) -1 d) 2

9. $\triangle ABC$ ਵਿੱਚ, $\angle B = 90^\circ$ ਜੇ $\tan A = 1$ ਹੈ ਤਾਂ $\sin A =$ In $\triangle ABC$, $\angle B = 90^\circ$, If $\tan A = 1$ then $\sin A =$

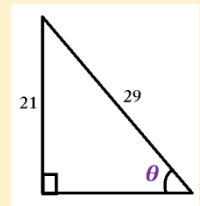
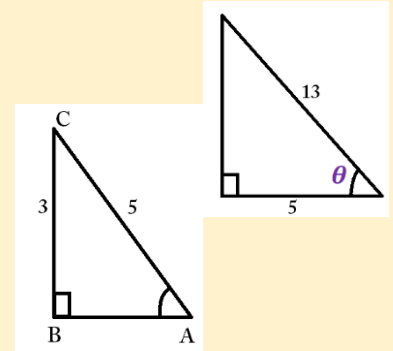
- a) $\frac{1}{2}$ b) $\sqrt{2}$ c) $\frac{1}{\sqrt{2}}$ d) $\frac{1}{3}$

10. ਜੇ $\cos A = \cos B$ ਹੈ ਤਾਂ

- a) $A + B = 90^\circ$ b) $A + B = 180^\circ$ c) $A - B = 90^\circ$ d) $A = B$

11. $\tan 30^\circ =$

- a) $\frac{1}{\sqrt{3}}$ b) $\sqrt{3}$ c) 1 d) $\frac{\sqrt{3}}{2}$



12. $\sec 45^\circ =$

- a) 1 b) $\frac{2}{\sqrt{3}}$ c) 2 d) $\sqrt{2}$

13. $\operatorname{cosec}^2 60^\circ - \cot^2 60^\circ =$

- a) -1 b) 0 c) 1 d) 2

14. ਜੇ $\cos A = \frac{\sqrt{3}}{2}$ ਹੈ ਤਾਂ $A =$

- a) 30° b) 45° c) 60° d) 90°

15. ਜੇ $\cot \theta = 1$ ਹੈ ਤਾਂ $\theta =$

- a) 30° b) 45° c) 60° d) 0°

16. ਜੇ $\sec \theta = 2$ ਹੈ ਤਾਂ $\theta =$

- a) 0° b) 30° c) 45° d) 60°

17. $\triangle ABC$ ਵਿੱਚ $\angle B = 90^\circ$, $AB = 5 \text{ cm}$ ਅਤੇ $\angle ACB = 30^\circ$ ਹੈ ਤਾਂ $BC =$

- a) 5 cm b) $5\sqrt{3} \text{ cm}$ c) $10\sqrt{3} \text{ cm}$ d) 10 cm

18. $\triangle PQR$ ਵਿੱਚ $\angle Q = 90^\circ$, $PQ = 3 \text{ cm}$ ਅਤੇ $PR = 6 \text{ cm}$ ਹੈ ਤਾਂ $\angle PRQ =$

- a) 30° b) 45° c) 60° d) 90°

19. $\frac{2\tan 30^\circ}{1+\tan^2 30^\circ} =$

- a) $\sin 60^\circ$ b) $\cos 60^\circ$ c) $\tan 60^\circ$ d) $\sin 30^\circ$

20. $\frac{1-\tan^2 45^\circ}{1+\tan^2 45^\circ} =$

- a) $\tan 90^\circ$ b) $\tan 45^\circ$ c) $\sin 45^\circ$ d) $\tan 0^\circ$

21. $\sin 2A = 2\sin A$ ਉਦੋਂ ਸੱਚ ਹੁੰਦਾ ਹੈ, ਜਦੋਂ $A =$

- a) 0° b) 30° c) 45° d) 60°

22. $\frac{2\tan 30^\circ}{1-\tan^2 30^\circ} =$

- a) $\cos 60^\circ$ b) $\sin 60^\circ$ c) $\tan 60^\circ$ d) $\sin 30^\circ$

23. ਜੇ $\sin \theta = \cos \theta$ ਹੈ ਤਾਂ $\theta =$

- a) 0° b) 30° c) 45° d) 60°

24. ਜੇ $\tan A = \cot B$ ਹੈ ਤਾਂ $A + B =$ If $\tan A = \cot B$ then $A + B =$

- a) 30° b) 45° c) 60° d) 90°

25. $\sin(90 - \theta) =$

- a) $\operatorname{cosec}\theta$ b) $\cos\theta$ c) $\sin 90 - \sin\theta$ d) $\tan\theta$

26. $\frac{\tan 65^\circ}{\cot 25^\circ} =$

- a) 1 b) -1 c) 0 d) 2

27. $\sin 40^\circ - \cos 50^\circ =$

- a) 1 b) -1 c) 0 d) 10°

28. $\operatorname{cosec} 31^\circ - \sec 59^\circ =$

- a) 1 b) 28° c) -28° d) 0

29. ਜੇ $\tan 2A = \cot (A - 18^\circ)$ ਹੈ ਤਾਂ $A =$

- a) 36° b) 18° c) 34° d) 28°

30. ਜੇ $\sin 3A = \cos (A - 26^\circ)$ ਹੈ ਤਾਂ $A =$

- a) 31° b) 29° c) 28° d) 26°

31. ਜੇ $\sec 4A = \operatorname{cosec}(A - 20^\circ)$ ਤਾਂ $A =$

- a) 24° b) 26° c) 22° d) 28°

32. $\frac{\sin^2 63^\circ + \sin^2 27^\circ}{\cos^2 17^\circ + \cos^2 73^\circ} =$

- a) 0 b) 2 c) -2 d) 1

33. $9\sec^2 A - 9\tan^2 A =$

- a) 1 b) 9 c) 8 d) 0

34. $\frac{1 + \tan^2 A}{1 + \cot^2 A} =$

- a) $\sec^2 A$ b) -1 c) $\cot^2 A$ d) $\tan^2 A$

35. $\sin 25^\circ \cdot \cos 65^\circ + \cos 25^\circ \cdot \sin 65^\circ =$

- a) 1 b) 0 c) 2 d) -1

36. $\tan A =$

- a) $\frac{\sin A}{\sqrt{1 + \sin^2 A}}$ b) $\frac{\sin A}{\sqrt{1 - \sin^2 A}}$ c) $\frac{\sqrt{1 - \sin^2 A}}{\sin A}$ d) $\frac{\sqrt{1 + \sin^2 A}}{\sin A}$

37. $\operatorname{cosec}\theta =$

- a) $\frac{1}{\sqrt{1 - \cos^2 \theta}}$ b) $\frac{1}{\sqrt{1 + \cos^2 \theta}}$ c) $\frac{\cos \theta}{\sqrt{1 - \cos^2 \theta}}$ d) $\frac{\cos \theta}{\sqrt{1 + \cos^2 \theta}}$

38. $5\cot^2\theta - 5\operatorname{cosec}^2\theta =$

- a) 5 b) 1 c) -1 d) -5

39. ਹੇਠਾਂ ਲਿਖਿਆਂ ਵਿੱਚੋਂ ਕਿਹੜਾ $\sin\theta$ ਦਾ ਮੁੱਲ ਨਹੀਂ ਹੋ ਸਕਦਾ ਹੈ?

Which of the following cannot be value of $\sin\theta$?

- a) $\frac{12}{13}$ b) $\frac{1}{\sqrt{3}}$ c) $\frac{\sqrt{3}}{2}$ d) 1

40. ਚਿੱਤਰ ਵਿੱਚ $\tan P - \cot R =$ In figure, $\tan P - \cot R =$

- a) 1 b) $\frac{12}{13}$ c) 0 d) $-\frac{5}{13}$

