திரிகோண கணிதம்

1. அடிப்படை சமன்பாடுகள்
2. முக்கோணியின் பண்புகள்
3. திரிகோண கணித சமன்பாடுகளை சுருக்குதல்
4. நேர்மாறு திரிகோண கணித சார்புகள்
5. திரிகோண கணித வரைபுகள்

01.அடிப்படை சமன்பாடுகள்

$\text{cosec}\,\theta = \frac{1}{sin\,\theta}$
$sec\,\theta = \frac{1}{cos\,\theta}$
$cot\,\theta = \frac{1}{\tan\theta}$
$\tan\theta = \frac{sin\,\theta}{cos\,\theta}$
$cot\,\theta = \frac{cos\,\theta}{sin\,\theta}$

$sin^2\theta + cos^2\theta = 1$
$1 + tan^2\theta = sec^2\theta$
$1 + cot^2\theta = cosec^2\theta$

திரிகோண கணித அடிப்படை சூத்திரங்கள்

பின்வரும் சமன்பாடுகளை நிறுவுக

1. $\cos A + cosec\ A = \cot A$
2. $\tan A\ cosec\ A \cos A = 1$
3. $cos^2 A\ tan^2\ A + \sin^2 A\ cot^2 A = 1$
4. $(1 - \sin^2 A)(1 + cot^2 A) = cot^2 A$
5. $sin^2 A\ cos^2 B - cos^2 A\ sin^2 B = sin\ ^2 A - sin^2 B$
6. $\frac{\sec A}{\tan A + \cot A} = \sin A$
7. $\sin\theta\sqrt{1 + tan^2}\ \theta = \sqrt{sec^2\theta - 1}$
8. $cosec^4 A - 1 = cot^2 A(2 + cot^2 A)$
9. $sin^2 A(1 + cot^2 A) + cos^2 A(1 + tan^2 A) = 2$
10. $(\text{cosec A} + \sin A)\ (\text{cosec A} - \sin A)\ = cot^2 A + \ cos^2 A$
11. $(cosec\ \theta + \cot\theta)(1 - \cos\theta) = \sin\theta$
12. $(\sec\theta - \cos\theta)(cosec\ \theta - \sin\theta)(\tan\theta + \cot\theta) = 1$
13. $\frac{1+tan^2 A}{1+cot^2 A} = tan^2 A$
14. $\frac{\tan A - \cot B}{\tan B - \cot A} = \tan A \cot B$
15. $\frac{\cot A + \tan B}{\tan B + \cot B} = \cot A \tan B$
16. $\frac{tan^2 A(1+cot^2 A)}{cot^2 A(1+tan^2 A)} = sin^2 A\ sec^2 A$
17. $cot^2 A + cosec^2 B = cosec^2 A + cot^2 B$

18. $(\sin\theta + cosec\ \theta)^2 + (\cos\theta + \sec\theta)^2 = tan^2\theta + cot^2\theta + 7$

19. $\frac{\sec\theta - \cos\theta}{\sin\theta} = \tan\theta$

20. $sin^2A tan^2A + cos^2A cot^2A = tan^2A + cot^2A - 1$

21. $(\tan A + cosec\ B)^2 - (\cot B - \sec A)^2 = 2\tan A \cot B\ (cosec\ A + secB)$

22. $\cos\theta(2\sec\theta + \tan\theta)(\sec\theta - 2\tan\theta) = 2\cos\theta - 3\tan\theta$

23. $(sec^2\theta + tan^2\theta)(cosec^2\theta + cot^2\theta) = 1 + sec^2\theta . cosec^2\theta$

24. $\cos\theta(2 + \tan\theta)(1 + 2\tan\theta)(1 + 2\tan\theta) = 2\sec\theta + 5\sin\theta$

25. $(1 = \cot\theta + cosec\ \theta)(1 + \tan\theta - \sec\theta) = 2$

26. $\frac{\tan\theta + \cot\theta}{\cot\theta} = sec^2\theta$

27. $\sqrt{cosec^2A - 1} = \cos A\ cosec\ A$

28. $(\sec\theta - \cos\theta)(cosec\ \theta - \sin\ \theta) = \frac{\tan\theta}{1 + tan^2\theta}$

29. $\frac{\tan A + \sec A - 1}{\tan A - \sec A + 1} = \frac{1 + \sin A}{\cos\ A}$

30. $\frac{2\sin\theta\cos\theta - \cos\theta}{1 - \sin\theta - cos^2\theta + sin^2\theta} = cot^2$

31. $\frac{1}{cosec\ \theta - \cos\theta} + \frac{1}{cosec\ \theta + \cot\theta} = \frac{2}{\sin\theta}$

32. $\frac{\sec A - \tan A}{\sec A + \tan A} = 1 - 2\sec A\ .\tan A + 2\ tan^2A$

33. $\frac{\cos\theta}{\sec\theta - 1} - \frac{\cos\theta}{tan^2\theta} = cot^2\theta$

34. $\frac{sec^2\theta - 6\tan\theta + 7}{sec^2\theta - 5} = \frac{\tan\theta - 4}{\tan\theta + 2}$

35. $\frac{\cot A \cos A}{\cot A+\cos A} = \frac{\cot A-\cos A}{\cot A \cos A}$

36. $cot^2A \left(\frac{\sec A-1}{1+\sin A}\right) + \left(\frac{\sin A-1}{1+\sec A}\right) sec^2A = 0$

37. $\frac{\sin A}{1+\cos A} + \frac{1+\cos A}{\sin A} = 2 \operatorname{cosec} A$

38. $\sqrt{\frac{1-\sin A}{1+\sin A}} = \sec A - \tan A$

39. $\frac{1}{\sec A+\tan A} = \sec A - \tan A$

40. $\left(\frac{1}{sec^2A-cos^2A} + \frac{1}{cosec^2A- sin^2A}\right) cos^2A \, sin^2A = \frac{1-cos^2A \, sin^2A}{2+cos^2A \, sin^2A}$

41. $(1 - 2cos^2A)(\tan A + \cot A) = (\sin A - \cos A)9 \sec A + cosec \, A)$

42. $2sec^2\theta - sec^4\theta - 2cosec^2\theta + cosec^4\theta = cot^4\theta - tan^4\theta$

43. $sec^4\theta + tan^4\theta = 1 + 2 \, sec^2\theta tan^2\theta$

44. $cot^4\theta + cot^2\theta = cosec^4\theta - cosec^2\theta$

45. $sin^6A + cos^6A = 1 - 3sin^2A \, cos^2A$

46. $sin^6A - cos^6A = (1 - \sin A \cos A)(1 + sin \, A \cos A)(\sin A + \cos A)(\sin A - cosA)$

47. $sec^6A - tan^6A = 1 + 3tan^2A \, sec^2A$

48. $sin^8A - cos^8A = (1 - 2\sin^2A \, cos^2A)(\sin A + \cos A)(\sin A - \cos A)$

49. $\frac{1-3 \cos A-4cos^2A}{sin^2A} = \frac{1-4 \cos A}{1-\cos A}$

50. $\frac{1+\sin\theta+\cos\theta}{1-\sin\theta+\cos\theta} = \frac{1+\sin\theta}{\cos\theta}$