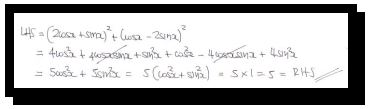
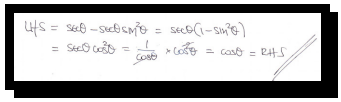
TRIGONOMETRIC IDENTITIES

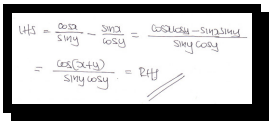
1. $\left(2\cos x+\sin x\right)^2+\left(\cos x-2\sin x\right)^2\equiv 5$ **(**)**



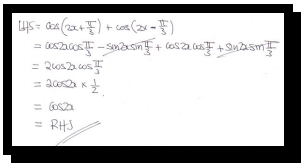
2. $\sec\theta-\sec\theta\sin^2\theta\equiv\cos\theta$ **(**)**



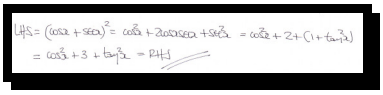
3. $\dfrac{\cos x}{\sin y}-\dfrac{\sin x}{\cos y}\equiv\dfrac{\cos\left(x+y\right)}{\sin y\cos y}$ **(**)**



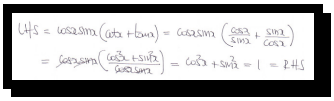
4. $\cos\left(2x+\dfrac{\pi}{3}\right)+\cos\left(2x-\dfrac{\pi}{3}\right)\equiv\cos 2x$ **(**)**



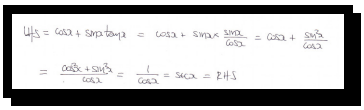
5. $\left(\cos x+\sec x\right)^2\equiv\tan^2 x+\cos^2 x+3$ **(**)**



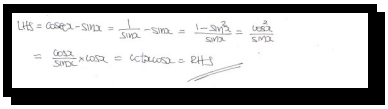
6. $\cos x\sin x\left(\cot x+\tan x\right)\equiv 1$ **(**)**



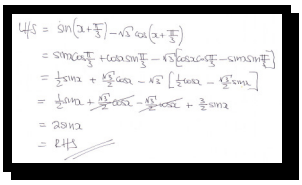
7. $\cos x+\sin x\tan x\equiv\sec x$ **(**)**



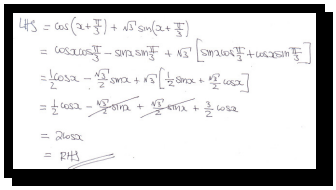
8. $\operatorname{cosec} x-\sin x\equiv\cos x\cot x$ **(**)**



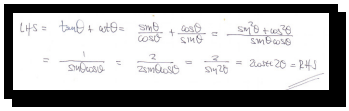
9. $\sin\left(x+\frac{\pi}{3}\right)-\sqrt{3}\cos\left(x+\frac{\pi}{3}\right)\equiv 2\sin x$ **(**)**



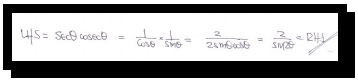
10. $\cos\left(x+\frac{\pi}{3}\right)+\sqrt{3}\sin\left(x+\frac{\pi}{3}\right)\equiv 2\cos x$ **(**)**



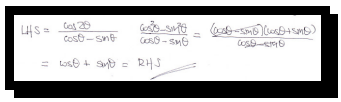
11. $\tan\theta+\cot\theta\equiv 2\operatorname{cosec} 2\theta$ **(**)**



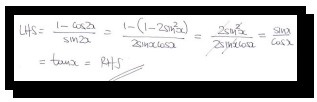
12. $\sec\theta\operatorname{cosec}\theta\equiv 2\operatorname{cosec} 2\theta$ **(**)**



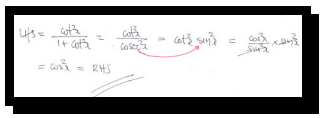
13. $\dfrac{\cos 2\theta}{\cos\theta-\sin\theta}\equiv\cos\theta+\sin\theta$ **(**)**



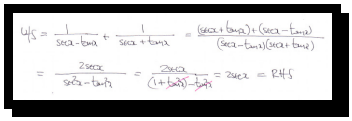
14. $\dfrac{1-\cos 2x}{\sin 2x}\equiv\tan x$ **(**)**



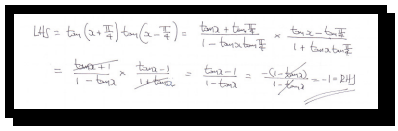
15. $\dfrac{\cot^2 x}{1+\cot^2 x}\equiv\cos^2 x$ **(**)**



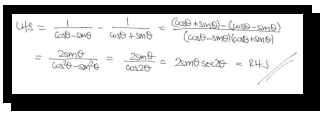
16. $\dfrac{1}{\sec x-\tan x}+\dfrac{1}{\sec x+\tan x}\equiv 2\sec x$ **(**)**



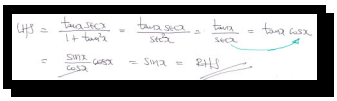
17. $\tan\left(x+\frac{\pi}{4}\right)\tan\left(x-\frac{\pi}{4}\right)\equiv -1$ **(**)**



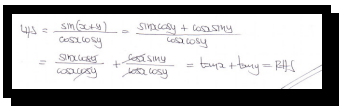
18. $\frac{1}{\cos\theta-\sin\theta}-\frac{1}{\cos\theta+\sin\theta}\equiv 2\sin\theta\sec 2\theta$ **(**)**



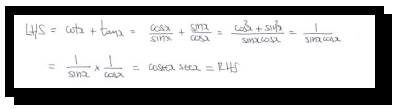
19. $\frac{\tan x\sec x}{1+\tan^2 x}\equiv \sin x$ **(**)**



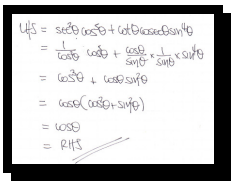
20. $\frac{\sin(x+y)}{\cos x\cos y}\equiv \tan x+\tan y$ **(**)**



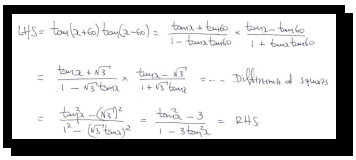
21. $\cot x + \tan x \equiv \sec x \operatorname{cosec} x$ **(**)**



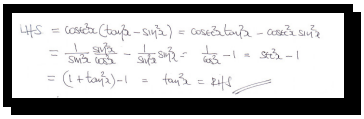
22. $\sec^2\theta\cos^5\theta + \cot\theta\operatorname{cosec}\theta\sin^4\theta \equiv \cos\theta$ **(**)**



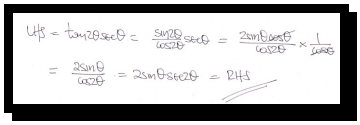
23. $\tan\left(x+60°\right)\tan\left(x-60°\right) \equiv \dfrac{\tan^2 x - 3}{1 - 3\tan^2 x}$ **(**)**



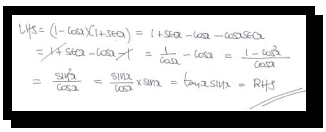
24. $\operatorname{cosec}^2 x\left(\tan^2 x - \sin^2 x\right) \equiv \tan^2 x$ **(**+)**



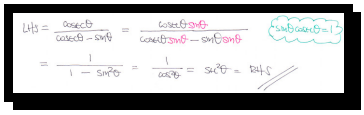
25. $\tan 2\theta \sec\theta \equiv 2\sin\theta \sec 2\theta$ **(**+)**



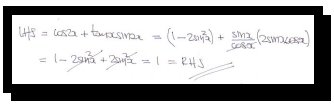
26. $(1-\cos x)(1+\sec x) \equiv \sin x \tan x$ **(**+)**



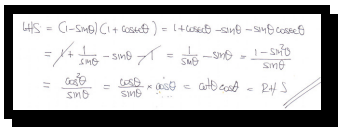
27. $\dfrac{\operatorname{cosec}\theta}{\operatorname{cosec}\theta - \sin\theta} \equiv \sec^2\theta$ **(**+)**



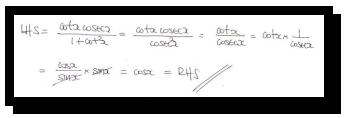
28. $\cos 2x + \tan x \sin 2x \equiv 1$ **(**+)**



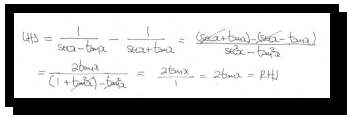
29. $(1-\sin\theta)(1+\operatorname{cosec}\theta)\equiv\cos\theta\cot\theta$ **(**+)**



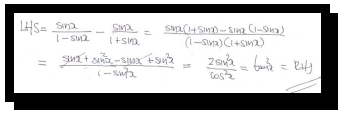
30. $\dfrac{\cot x\operatorname{cosec} x}{1+\cot^2 x}\equiv\cos x$ **(**+)**



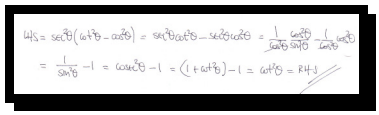
31. $\dfrac{1}{\sec x-\tan x}-\dfrac{1}{\sec x+\tan x}\equiv 2\tan x$ **(**+)**



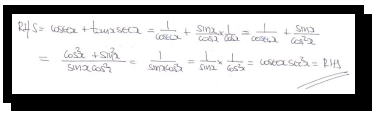
32. $\dfrac{\sin x}{1-\sin x}-\dfrac{\sin x}{1+\sin x}\equiv 2\tan^2 x$ **(**+)**



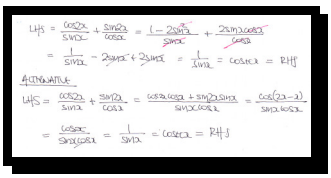
33. $\sec^2\theta\left(\cot^2\theta-\cos^2\theta\right)\equiv\cot^2\theta$ **(**+)**



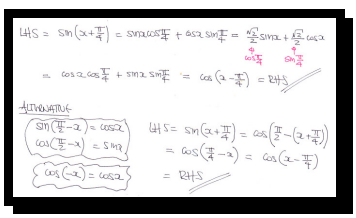
34. $\operatorname{cosec} x\sec^2 x\equiv\operatorname{cosec} x+\tan x\sec x$ **(**+)**



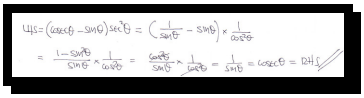
35. $\dfrac{\cos 2x}{\sin x}+\dfrac{\sin 2x}{\cos x}\equiv\operatorname{cosec} x$ **(**+)**



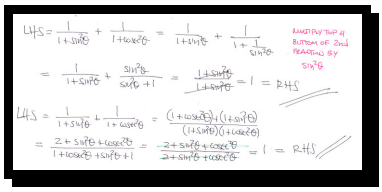
36. $\sin\left(x+\dfrac{\pi}{4}\right)\equiv\cos\left(x-\dfrac{\pi}{4}\right)$ **(***)**



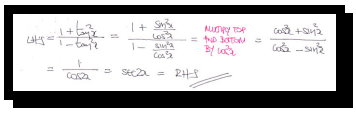
37. $(\operatorname{cosec}\theta - \sin\theta)\sec^2\theta \equiv \operatorname{cosec}\theta$ (***)



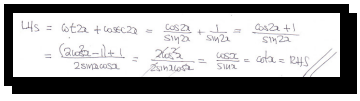
38. $\dfrac{1}{1+\sin^2\theta} + \dfrac{1}{1+\operatorname{cosec}^2\theta} \equiv 1$ (***)



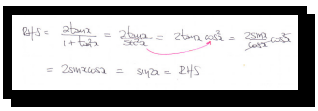
39. $\dfrac{1+\tan^2 x}{1-\tan^2 x} \equiv \sec 2x$ (***)



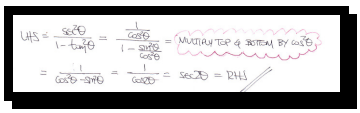
40. $\cot 2x + \operatorname{cosec} 2x \equiv \cot x$ (***)



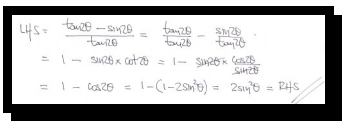
41. $\sin 2x \equiv \dfrac{2\tan x}{1+\tan^2 x}$ **(***)**



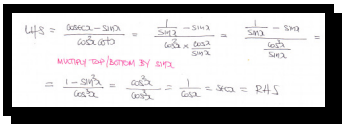
42. $\dfrac{\sec^2\theta}{1-\tan^2\theta} \equiv \sec 2\theta$ **(***)**



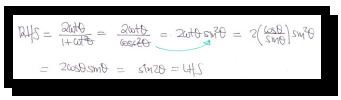
43. $\dfrac{\tan 2\theta - \sin 2\theta}{\tan 2\theta} \equiv 2\sin^2\theta$ **(***)**



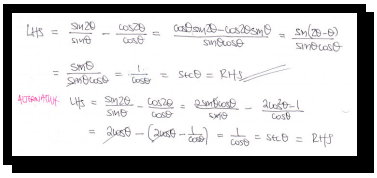
44. $\dfrac{\operatorname{cosec} x - \sin x}{\cos^2 x \cot x} \equiv \sec x$ **(***)**



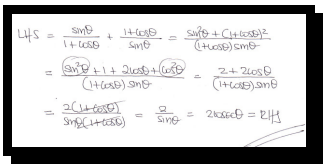
45. $\sin 2\theta \equiv \dfrac{2\cot\theta}{1+\cot^2\theta}$ **(***)**



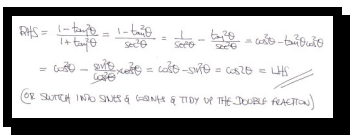
46. $\dfrac{\sin 2\theta}{\sin\theta} - \dfrac{\cos 2\theta}{\cos\theta} \equiv \sec\theta$ **(***)**



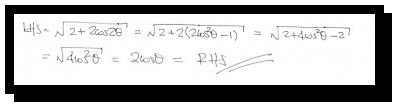
47. $\dfrac{\sin\theta}{1+\cos\theta} + \dfrac{1+\cos\theta}{\sin\theta} \equiv 2\operatorname{cosec}\theta$ **(***)**



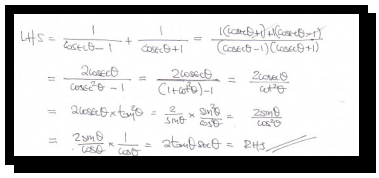
48. $\cos 2\theta \equiv \dfrac{1-\tan^2\theta}{1+\tan^2\theta}$ **(***)**



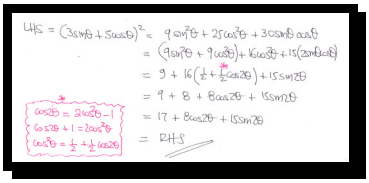
49. $\sqrt{2+2\cos 2\theta} \equiv 2\cos\theta$ **(***)**



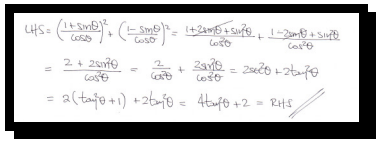
50. $\dfrac{1}{\operatorname{cosec}\theta - 1} + \dfrac{1}{\operatorname{cosec}\theta + 1} \equiv 2\sec\theta\tan\theta$ **(***+)**



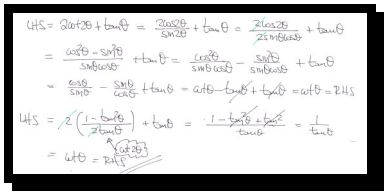
51. $(3\sin\theta + 5\cos\theta)^2 \equiv 17 + 8\cos 2\theta + 15\sin 2\theta$ **(***+)**



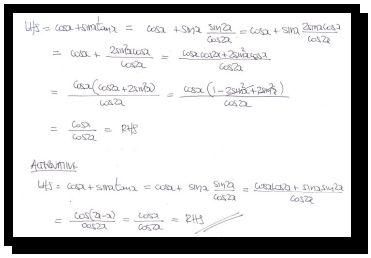
52. $\left(\dfrac{1+\sin\theta}{\cos\theta}\right)^2 + \left(\dfrac{1-\sin\theta}{\cos\theta}\right)^2 \equiv 2 + 4\tan^2\theta$ **(***+)**



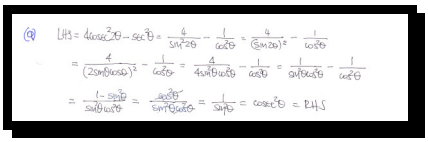
53. $2\cot 2\theta + \tan\theta \equiv \cot\theta$ **(***+)**



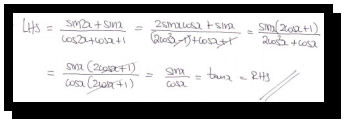
54. $\cos x + \sin x \tan 2x \equiv \dfrac{\cos x}{\cos 2x}$ **(***+)**



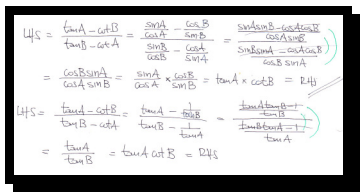
55. $4\text{cosec}^2 2\theta - \sec^2\theta \equiv \text{cosec}^2\theta$ (***+)



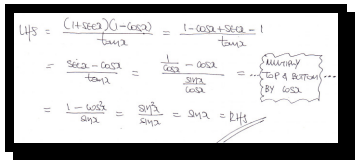
56. $\dfrac{\sin 2x + \sin x}{\cos 2x + \cos x + 1} \equiv \tan x$ **(***+)**



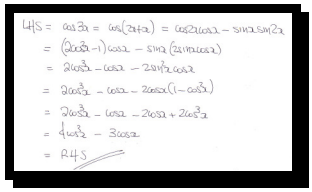
57. $\dfrac{\tan A-\cot B}{\tan B-\cot A}\equiv\tan A\cot B$ **(***+)**



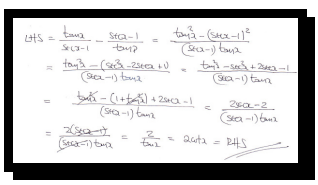
58. $\dfrac{(1+\sec x)(1-\cos x)}{\tan x}\equiv\sin x$ **(***+)**



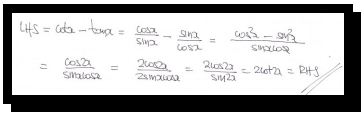
59. $\cos 3x\equiv 4\cos^3 x-3\cos x$ **(***+)**



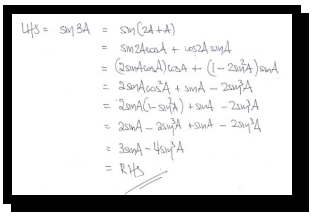
60. $\dfrac{\tan x}{\sec x-1}-\dfrac{\sec x-1}{\tan x}\equiv 2\cot x$ **(***+)**



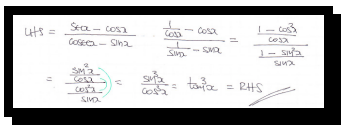
61. $\cot x - \tan x \equiv 2\cot 2x$ **(***+)**



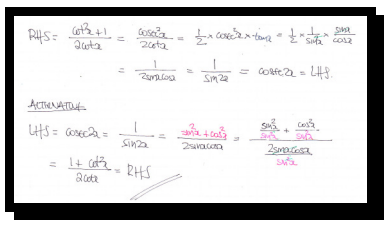
62. $\sin 3A \equiv 3\sin A - 4\sin^3 A$ **(***+)**



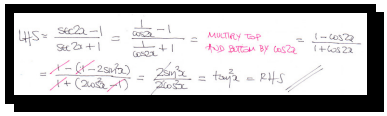
63. $\dfrac{\sec x - \cos x}{\operatorname{cosec} x - \sin x} \equiv \tan^3 x$ **(***+)**



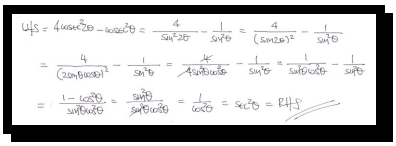
64. $\operatorname{cosec} 2x \equiv \dfrac{\cot^2 x + 1}{2\cot x}$ **(***+)**



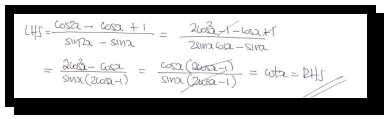
65. $\dfrac{\sec 2x-1}{\sec 2x+1}\equiv \tan^2 x$ **(***+)**



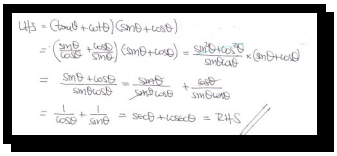
66. $4\text{cosec}^2 2\theta-\text{cosec}^2\theta\equiv \sec^2\theta$ **(***+)**



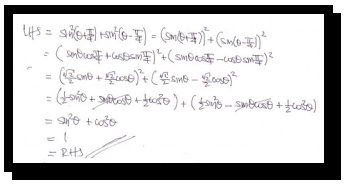
67. $\dfrac{\cos 2x-\cos x+1}{\sin 2x-\sin x}\equiv \cot x$ **(***+)**



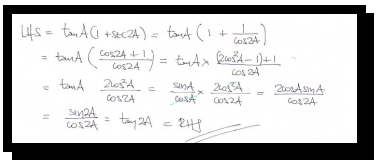
68. $\left(\tan\theta+\cot\theta\right)\left(\sin\theta+\cos\theta\right)\equiv \sec\theta+\text{cosec}\,\theta$ **(***+)**



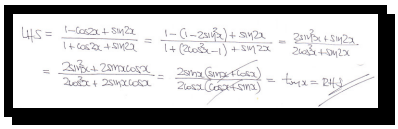
69. $\sin^2\left(\theta+\frac{\pi}{4}\right)+\sin^2\left(\theta-\frac{\pi}{4}\right)\equiv 1$ **(***)**



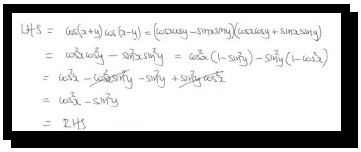
70. $\tan A\left(1+\sec 2A\right)\equiv \tan 2A$ **(****)**



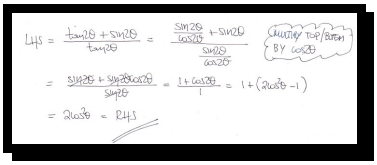
71. $\dfrac{1-\cos 2x+\sin 2x}{1+\cos 2x+\sin 2x}\equiv \tan x$.



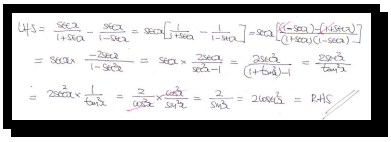
72. $\cos\left(x+y\right)\cos\left(x-y\right)\equiv \cos^2 x-\sin^2 y$ **(****)**



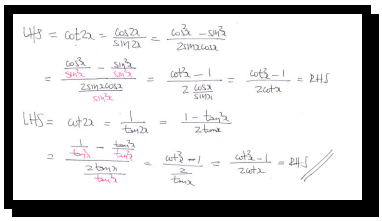
73. $\dfrac{\tan 2\theta + \sin 2\theta}{\tan 2\theta} \equiv 2\cos^2\theta$ **(****)**



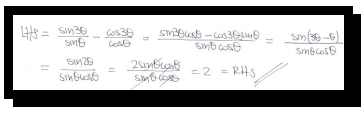
74. $\dfrac{\sec x}{1+\sec x} - \dfrac{\sec x}{1-\sec x} \equiv 2\operatorname{cosec}^2 x$ **(****)**



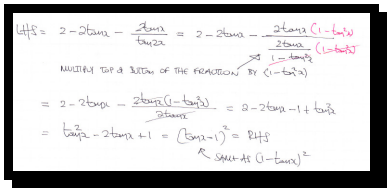
75. $\cot 2x \equiv \dfrac{\cot^2 x - 1}{2\cot x}$ **(****)**



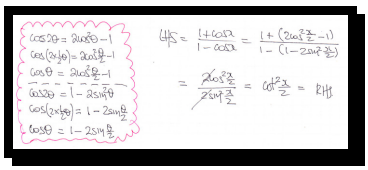
76. $\dfrac{\sin 3\theta}{\sin\theta} - \dfrac{\cos 3\theta}{\cos\theta} \equiv 2$ **(****)**



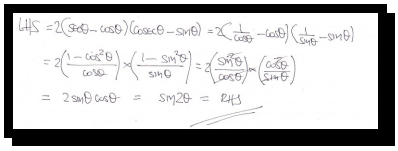
77. $2-2\tan x-\dfrac{2\tan x}{\tan 2x}\equiv(1-\tan x)^2$ **(****)**



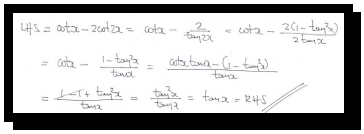
78. $\dfrac{1+\cos x}{1-\cos x}\equiv\cot^2\dfrac{1}{2}x$ **(****)**



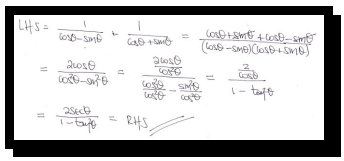
79. $2\left(\sec\theta-\cos\theta\right)\left(\operatorname{cosec}\theta-\sin\theta\right)\equiv\sin 2\theta$ **(****)**



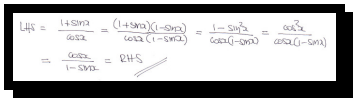
80. $\cot x-2\cot 2x\equiv\tan x$ **(****)**



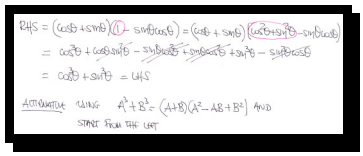
81. $\dfrac{1}{\cos\theta-\sin\theta}+\dfrac{1}{\cos\theta+\sin\theta}\equiv\dfrac{2\sec\theta}{1-\tan^2\theta}$ **(****)**



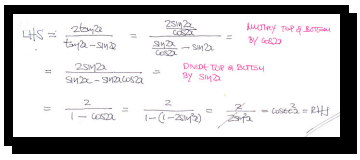
82. $\dfrac{1+\sin x}{\cos x}\equiv\dfrac{\cos x}{1-\sin x}$ **(****)**



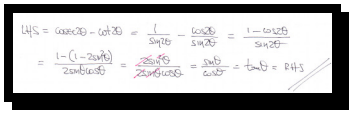
83. $\cos^3\theta+\sin^3\theta\equiv(\cos\theta+\sin\theta)(1-\sin\theta\cos\theta)$ **(****)**



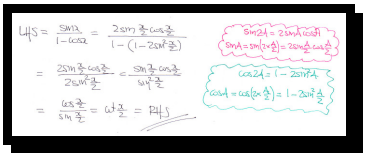
84. $\dfrac{2\tan 2x}{\tan 2x-\sin 2x}\equiv\operatorname{cosec}^2 x$ **(****)**



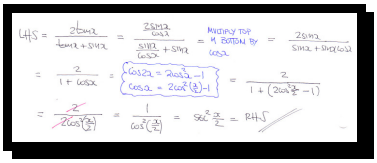
85. $\operatorname{cosec} 2\theta - \cot 2\theta \equiv \tan\theta \quad$ **(****)**



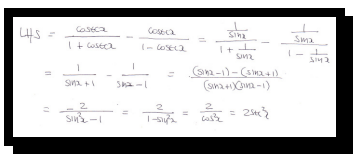
86. $\dfrac{\sin x}{1-\cos x} \equiv \cot\dfrac{1}{2}x \quad$ **(****)**



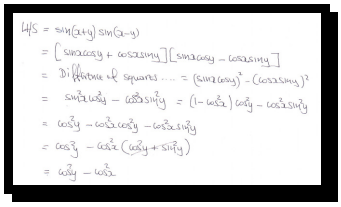
87. $\dfrac{2\tan x}{\tan x + \sin x} \equiv \sec^2\left(\dfrac{x}{2}\right) \quad$ **(****)**



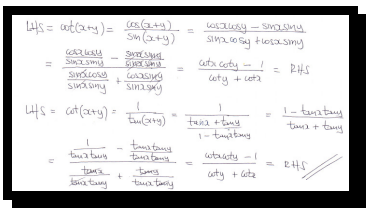
88. $\dfrac{\operatorname{cosec} x}{1+\operatorname{cosec} x} - \dfrac{\operatorname{cosec} x}{1-\operatorname{cosec} x} \equiv 2\sec^2 x \quad$ **(****)**



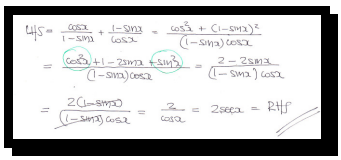
89. $\sin(x+y)\sin(x-y) \equiv \cos^2 y - \cos^2 x$ **(****)**



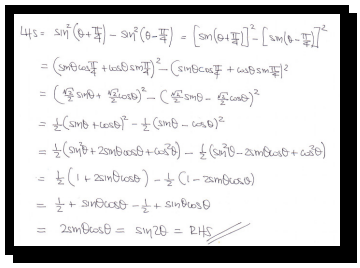
90. $\cot(x+y) \equiv \dfrac{\cot x \cot y - 1}{\cot x + \cot y}$ **(****)**



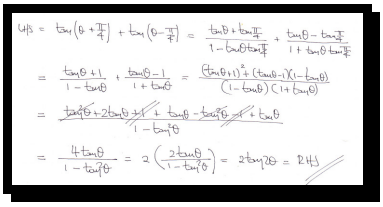
91. $\dfrac{\cos x}{1-\sin x} + \dfrac{1-\sin x}{\cos x} \equiv 2\sec x$ **(****)**



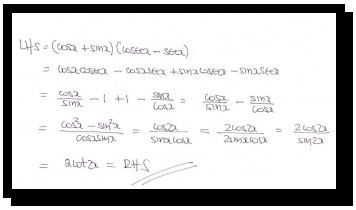
92. $\sin^2\left(\theta+\frac{\pi}{4}\right)-\sin^2\left(\theta-\frac{\pi}{4}\right)\equiv\sin 2\theta$ **(****)**



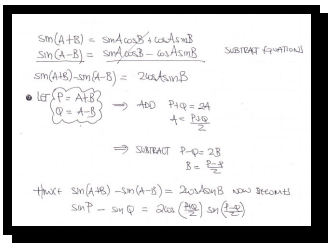
93. $\tan\left(\theta+\frac{\pi}{4}\right)+\tan\left(\theta-\frac{\pi}{4}\right)\equiv 2\tan 2\theta$ **(****)**



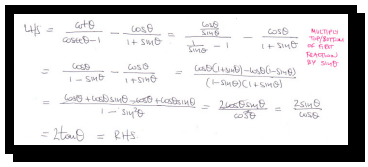
94. $(\cos x+\sin x)(\operatorname{cosec} x-\sec x)\equiv 2\cot 2x$ **(****)**



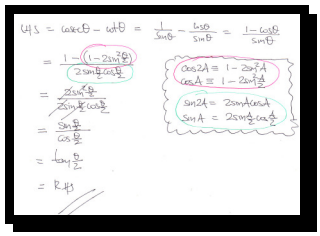
95. $\sin P - \sin Q \equiv 2\cos\left(\frac{P+Q}{2}\right)\sin\left(\frac{P-Q}{2}\right)$ **(****)**



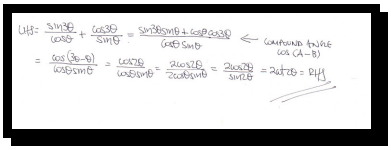
96. $\dfrac{\cot\theta}{\operatorname{cosec}\theta - 1} - \dfrac{\cos\theta}{1+\sin\theta} \equiv 2\tan\theta$ **(****)**



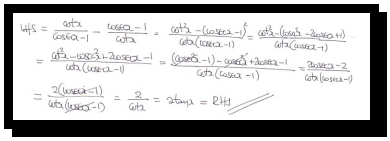
97. $\operatorname{cosec}\theta - \cot\theta \equiv \tan\frac{1}{2}\theta$ **(****)**



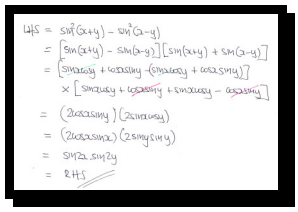
98. $\dfrac{\sin 3\theta}{\cos\theta}+\dfrac{\cos 3\theta}{\sin\theta}\equiv 2\cot 2\theta$ **(****)**



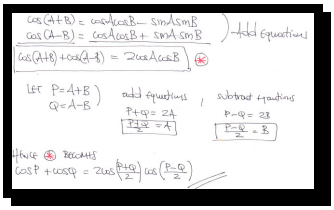
99. $\dfrac{\cot x}{\operatorname{cosec} x-1}-\dfrac{\operatorname{cosec} x-1}{\cot x}\equiv 2\tan x$ **(****)**



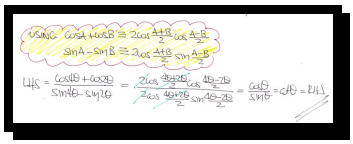
100. $\sin^2(x+y)-\sin^2(x-y)\equiv \sin 2x\sin 2y$ **(****)**

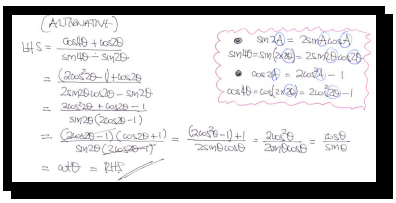


101. $\cos P+\cos Q\equiv 2\cos\left(\dfrac{P+Q}{2}\right)\cos\left(\dfrac{P-Q}{2}\right)$ **(****)**

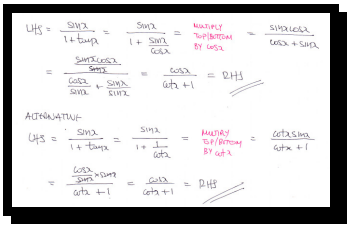


102. $\dfrac{\cos 4\theta + \cos 2\theta}{\sin 4\theta - \sin 2\theta} \equiv \cot\theta$ **(****+)**

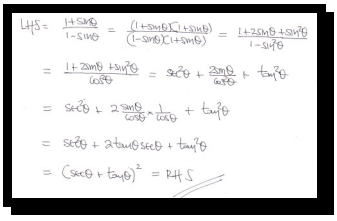




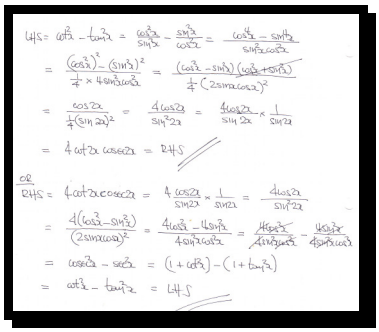
103. $\dfrac{\sin x}{1+\tan x} \equiv \dfrac{\cos x}{1+\cot x}$ **(****+)**



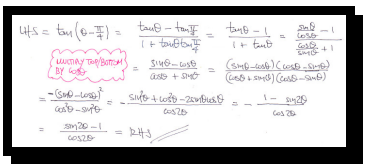
104. $\dfrac{1+\sin\theta}{1-\sin\theta} \equiv \left(\sec\theta + \tan\theta\right)^2$ **(****+)**



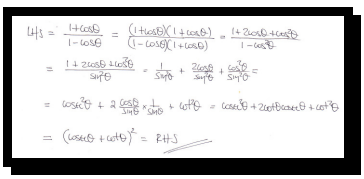
105. $\cot^2 x - \tan^2 x \equiv 4\cot 2x \operatorname{cosec} 2x$ **(****+)**



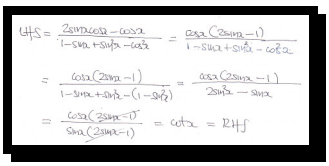
106. $\tan\left(\theta - \dfrac{\pi}{4}\right) \equiv \dfrac{\sin 2\theta - 1}{\cos 2\theta}$ **(****+)**



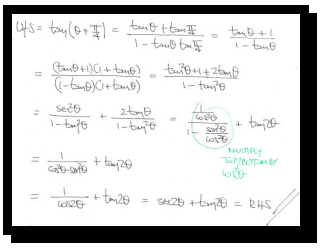
107. $\dfrac{1+\cos\theta}{1-\cos\theta} \equiv \left(\operatorname{cosec}\theta + \cot\theta\right)^2$ **(****+)**



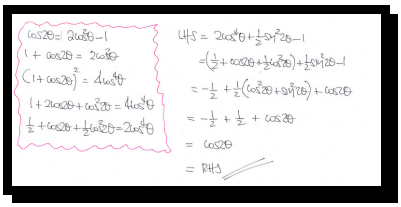
108. $\dfrac{2\sin x\cos x-\cos x}{1-\sin x+\sin^2 x-\cos^2 x}\equiv\cot x$ **(****+)**



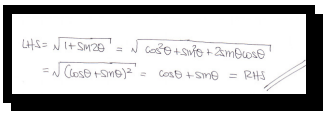
109. $\tan\left(\theta+\dfrac{\pi}{4}\right)\equiv\sec 2\theta+\tan 2\theta$ **(****+)**



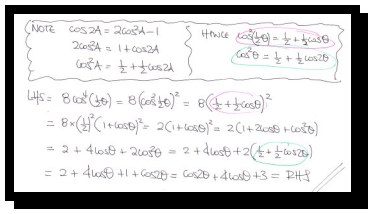
110. $2\cos^4\theta+\dfrac{1}{2}\sin^2 2\theta-1\equiv\cos 2\theta$ **(****+)**



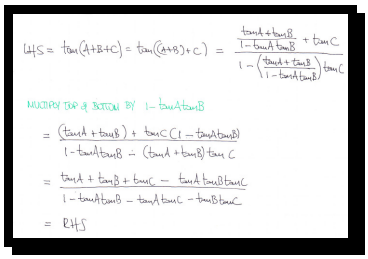
111. $\sqrt{1+\sin 2\theta}\equiv\sin\theta+\cos\theta$ **(****+)**



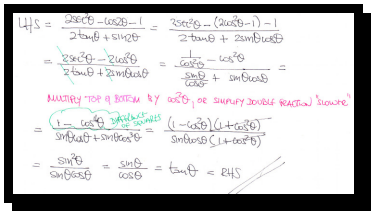
112. $8\cos^4\left(\frac{1}{2}\theta\right) \equiv \cos 2\theta + 4\cos\theta + 3$ **(****+)**



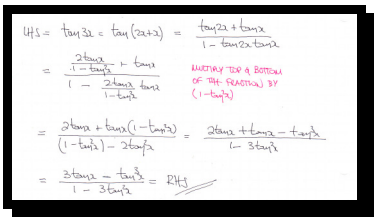
113. $\tan\left(A+B+C\right) \equiv \dfrac{\tan A+\tan B+\tan C-\tan A\tan B\tan C}{1-\tan A\tan B-\tan B\tan C-\tan C\tan A}$ **(****+)**



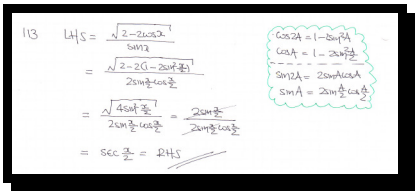
114. $\dfrac{2\sec^2\theta-\cos 2\theta-1}{2\tan\theta+\sin 2\theta} \equiv \tan\theta$ **(****+)**



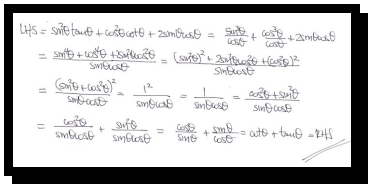
115. $\tan 3x \equiv \dfrac{3\tan x - \tan^3 x}{1-3\tan^2 x}$ **(****+)**



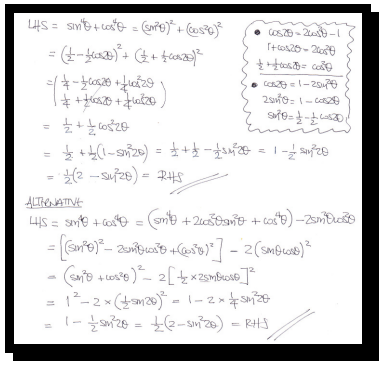
116. $\dfrac{\sqrt{2-2\cos x}}{\sin x} \equiv \sec\dfrac{x}{2}$ **(*****)**



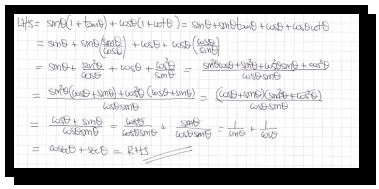
117. $\sin^2\theta\tan\theta + \cos^2\theta\cot\theta + 2\sin\theta\cos\theta \equiv \tan\theta + \cot\theta$ **(*****)**



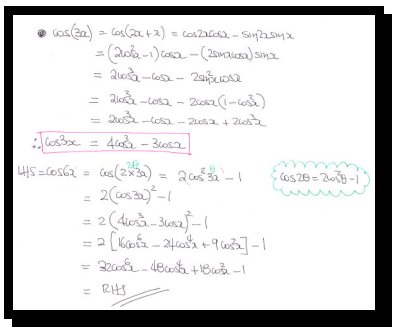
118. $\sin^4\theta+\cos^4\theta\equiv\frac{1}{2}\left(2-\sin^2 2\theta\right)$ **(*****)**



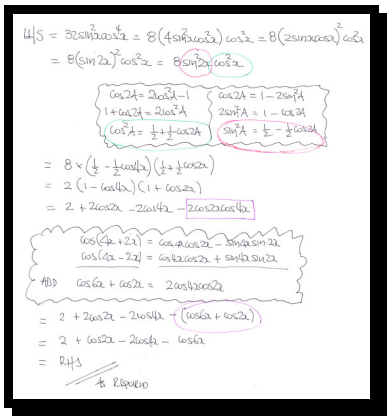
119. $\sin\theta\left(1+\tan\theta\right)+\cos\theta\left(1+\cot\theta\right)\equiv\sec\theta+\operatorname{cosec}\theta$ **(*****)**



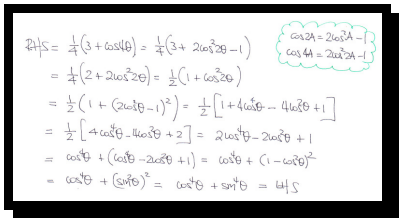
120. $\cos 6x\equiv 32\cos^6 x-48\cos^4 x+18\cos^2 x-1$ **(*****)**

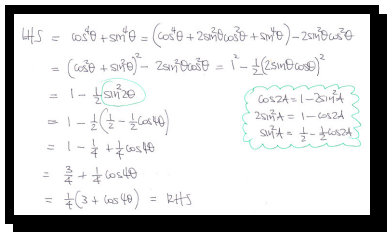


121. $32\sin^2 x\cos^4 x \equiv 2+\cos 2x-2\cos 4x-\cos 6x$ **(*****)**

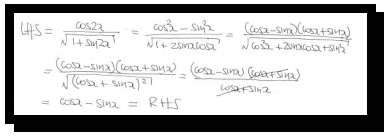


122. $\sin^4\theta+\cos^4\theta \equiv \frac{1}{4}\left(3+\cos 4\theta\right)$ **(*****)**

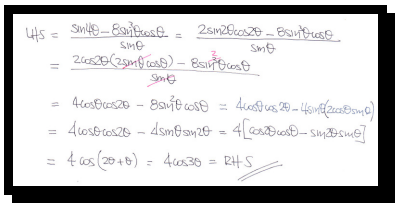




123. $\dfrac{\cos 2x}{\sqrt{1+\sin 2x}} \equiv \cos x-\sin x$ **(*****)**



124. $\dfrac{\sin 4\theta - 8\sin^3\theta\cos\theta}{\sin\theta} \equiv 4\cos 3\theta$ **(*****)**



125. $\cos^2 x + \sin^2 x \equiv 1$ **(*****)**

