MATHS

BOOKS - PUNJAB BOARD PREVIOUS YEAR PAPERS

Inverse Trigonometric Functions

Exercise

1. $\cos^{-1}\left(\cos\frac{7\pi}{6}\right)$ is equal to :

A. $7\frac{\pi}{6}$

B. $5\frac{\pi}{6}$

C. $\frac{\pi}{3}$

D. $\frac{\pi}{6}$

Answer:

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2. The value of `tan^-1 (tan (3π/4)) is :

A. $3\frac{\pi}{4}$

B. $\frac{\pi}{4}$

C. $-\frac{\pi}{4}$

D. $5\frac{\pi}{4}$

Answer:

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3. $\cos^{-1}\left(\sin 7\frac{\pi}{6}\right)$ equals :

A. $\frac{\pi}{3}$

B. $\frac{\pi}{6}$

C. $2\frac{\pi}{3}$

D. $5\frac{\pi}{6}$

Answer:

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4. The value of `sin^-1 (sin (2π/3)) is :

A. $2\frac{\pi}{3}$

B. $-2\frac{\pi}{3}$

C. $\frac{\pi}{3}$

D. $4\frac{\pi}{3}$

Answer:

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5. $\cos^{-1}\left(\cos 11\frac{\pi}{6}\right)$ equals :

A. $\frac{\pi}{3}$

B. $2\frac{\pi}{3}$

C. $5\frac{\pi}{6}$

D. $\frac{\pi}{6}$

Answer:

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6. $\cos^{-1}\left(\cos 13\frac{\pi}{6}\right)$ is :

A. $13\frac{\pi}{6}$

B. $\frac{\pi}{6}$

C. $7\frac{\pi}{6}$

D. $-\frac{\pi}{6}$

Answer:

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7. The value of $\cos\left(\sin^{-1}x + \cos^{-1}x\right)$ is equal to :

A. 1

B. 0

C. $-\frac{\pi}{2}$

D. $\frac{\pi}{2}$

Answer:

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8. The value of $\cot\left(\tan^{-1}x+\cot^{-1}x\right)$ is equal to :

A. 1

B. 0

C. $-\frac{\pi}{2}$

D. $\frac{\pi}{2}$

Answer:

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9. The value of $\cos ec\left(\sec^{-1} x + \cos ec^{-1} x\right)$ is equal to :

A. 1

B. 0

C. $-\frac{\pi}{2}$

D. $\frac{\pi}{2}$

Answer:

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10. $\tan^{-1}(\sqrt{3}) - \cot^{-1}(-\sqrt{3})$ is equal to :

A. π

B. 0

C. $2\sqrt{3}$

D. $-\frac{\pi}{2}$

Answer:

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11. $\tan^{-1}(1) - \cot^{-1}(-1)$ is equal to :

A. π

B. 0

C. 2

D. $-\frac{\pi}{2}$

Answer:

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12. $\tan^{-1}\left(\frac{1}{\sqrt{3}}\right) - \cot^{-1}\left(-\frac{1}{\sqrt{3}}\right)$ is equal to :

A. π

B. 0

C. $\frac{2}{\sqrt{3}}$

D. $-\frac{\pi}{2}$

Answer:

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13. Domain of function $f(x) = \sin^{-1}(x)$ is equal to

:

A. [0, 1]

B. R

C. [-1, 1]

D. None of these

Answer:

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14. Domain of the function $f(x) = \cos^{-1} x$ is equal to :

A. [-1, 1]

B. R

C. [0, 1]

D. None of these

Answer:

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15. Range of function $\sin^{-1} x$ is :

A. $\left[0, \frac{\pi}{2}\right]$

B. $\left(0, \frac{\pi}{2}\right)$

C. $\left(-\frac{\pi}{2}, 0\right)$

D. $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

Answer:

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16. If $\sin^{-1}\left(\frac{1}{5}\right) + \cos^{-1}(x) = \frac{\pi}{2}$, then value of x equals :

A. $\frac{1}{4}$

B. $\frac{1}{5}$

C. $\frac{1}{9}$

D. $\frac{1}{2}$

Answer:

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17. If $\sin^{-1}(x) + \cos^{-1}\left(\frac{1}{4}\right) = \frac{\pi}{2}$, then value of x equals :

A. $\frac{1}{4}$

B. $\frac{1}{5}$

C. $\frac{1}{9}$

D. 0

Answer:

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18. Range of function $\sin^{-1} x$ is :

A. [- 1, 1]

B. $\left[-\pi\frac{t}{2}, \frac{\pi}{2}\right]$

C. (- 1, 1)

D. $\left[-\pi\frac{t}{2}, \frac{\pi}{2}\right]$

Answer:

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19. Range of function $\cos^{-1} x$ is :

A. [- 1, 1]

B. $\left[-\pi\frac{t}{2}, \frac{\pi}{2}\right]$

C. $[0, \pi]$

D. (- 1, 1)

Answer:

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20. Range of function $\tan^{-1} x$ is :

A. $\left[-\pi\frac{t}{2}, \frac{\pi}{2}\right]$

B. $[0, \pi]$

C. $\left(-\pi\frac{t}{2}, \frac{\pi}{2}\right)$

D. $(0, \pi)$

Answer:

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21. The value of `sin^-1 (sin (2π/3)) is :

A. $\frac{\pi}{2}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{4}$

D. $\frac{\pi}{6}$

Answer:

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22. The Principle value of $\sin^{-1}\left(\sin\left(7\frac{\pi}{4}\right)\right)$ is :

A. $7\frac{\pi}{4}$

B. $3\frac{\pi}{4}$

C. $-3\frac{\pi}{4}$

D. $-\frac{\pi}{4}$

Answer:

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23. The Principle value of $\sin^{-1}\left(\sin\left(3\frac{\pi}{4}\right)\right)$ is :

A. $\frac{\pi}{2}$

B. $\frac{\pi}{3}$

C. $5\frac{\pi}{4}$

D. $\frac{\pi}{6}$

Answer:

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24. $\tan^{-1}(\sqrt{3}) - \cos^{-1}\left(\frac{1}{2}\right)$ is equal to :

A. $\frac{\pi}{3}$

B. $2\frac{\pi}{3}$

C. 0

D. $\frac{\pi}{6}$

Answer:

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25. $\tan^{-1}(1) - \cos^{-1}\left(\frac{1}{\sqrt{2}}\right)$ is equal to :

A. $\frac{\pi}{2}$

B. $\frac{\pi}{4}$

C. 0

D. π

Answer:

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26. $\tan^{-1}\left(\frac{1}{\sqrt{3}}\right) - \sin^{-1}\left(\frac{1}{2}\right)$ is equal to :

A. 0

B. $\frac{\pi}{3}$

C. $\frac{\pi}{4}$

D. $\frac{\pi}{6}$

Answer:

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27. If $\cos^{-I}$ x = y, then :

A. $-\left(\frac{\pi}{2}\right) \leq y \leq \left(\frac{\pi}{2}\right)$

B. $0 < y < \pi$

C. $-\left(\frac{\pi}{2}\right) < y < \left(\frac{\pi}{2}\right)$

D. $0 \leq y \leq \pi$

Answer:

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28. If $\tan^{-1} x = y$, then

A. $-\left(\frac{\pi}{2}\right) \leq y \leq \left(\frac{\pi}{2}\right)$

B. $0 < y < \pi$

C. $-\left(\frac{\pi}{2}\right) < y < \left(\frac{\pi}{2}\right)$

D. $0 \leq y \leq \pi$

Answer:

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29. If $\sin^{-1} x = y$, then

A. $-\left(\frac{\pi}{2}\right) \leq y \leq \left(\frac{\pi}{2}\right)$

B. $0 < y < \pi$

C. $-\left(\frac{\pi}{2}\right) < y < \left(\frac{\pi}{2}\right)$

D. $0 \leq y \leq \pi$

Answer:

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30. Principal value of `sin^-1 (-1/2) is :

A. $5\frac{\pi}{6}$

B. $\frac{\pi}{6}$

C. $-\frac{\pi}{6}$

D. $-5\frac{\pi}{6}$

Answer:

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31. Principal value of `cos^-1 (-1/2) is :

A. $2\frac{\pi}{3}$

B. $\frac{\pi}{3}$

C. $-\frac{\pi}{3}$

D. $-2\frac{\pi}{3}$

Answer:

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32. Principal value of `sin^-1 (-√3/2) is :

A. $2\frac{\pi}{3}$

B. $\frac{\pi}{3}$

C. $-\frac{\pi}{3}$

D. $-2\frac{\pi}{3}$

Answer:

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33. Principal value of `cosec^-1 (2) is :

A. $5\frac{\pi}{6}$

B. $\frac{\pi}{6}$

C. $-\frac{\pi}{6}$

D. $-5\frac{\pi}{6}$

Answer:

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34. Principal value of `sec^-1 (2/√3) is :

A. $5\frac{\pi}{6}$

B. $\frac{\pi}{6}$

C. $-\frac{\pi}{6}$

D. $-5\frac{\pi}{6}$

Answer:

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35. Principal value of `sec^-1 (2) is :

A. $\frac{\pi}{6}$

B. $\frac{\pi}{3}$

C. $-\frac{\pi}{6}$

D. $2\frac{\pi}{3}$

Answer:

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36. $\sin^{-1}\left(\frac{1}{2}\right)$ is equal to

A. 0

B. $\frac{\pi}{6}$

C. $\frac{\pi}{2}$

D. $\frac{\pi}{3}$

Answer:

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37. $\sin^{-1}(1)$ is equal to :

A. 0

B. $\frac{\pi}{6}$

C. $\frac{\pi}{2}$

D. $\frac{\pi}{3}$

Answer:

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38. $\sin^{-1}(0)$ is equal to :

A. 0

B. $\frac{\pi}{6}$

C. $\frac{\pi}{2}$

D. $\frac{\pi}{3}$

Answer:

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39. Principal value of $\cos^{-1}\left(-\cos\left(2\frac{\pi}{3}\right)\right)$ is

A. $\frac{\pi}{3}$

B. $2\frac{\pi}{3}$

C. $\frac{\pi}{5}$

D. $2\frac{\pi}{5}$

Answer:

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40. Principal value of $\cos^{-1}\left(-\cos\left(3\frac{\pi}{5}\right)\right)$ is

A. $\frac{\pi}{3}$

B. $2\frac{\pi}{3}$

C. $\frac{\pi}{5}$

D. $2\frac{\pi}{5}$

Answer:

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41. If $\cos^{-I}$ x = y, then :

A. $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$

B. $-\pi \leq y \leq \pi$

C. $0 \leq y \leq \frac{\pi}{2}$

D. $0 \leq y \leq \pi$

Answer:

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42. The Principal value of $\tan^{-1}\left(-\sqrt{3}\right)$ is

A. $\frac{\pi}{3}$

B. $-\frac{\pi}{3}$

C. $\frac{\pi}{4}$

D. $-\frac{\pi}{4}$

Answer:

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43. The Principal value of $\sin^{-1}\left(\frac{1}{2}\right)$ is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{3}$

D. $\frac{\pi}{2}$

Answer:

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44. If $\sin^{-1} x = y$, then

A. (0, 1)

B. (-1 , 1)

C. (-1 , I)

D. [0, 1]

Answer:

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45. Write the $\tan^{-1}\left(\frac{\cos x}{1+\sin x}\right), -\frac{\pi}{2} < x < \frac{\pi}{2}$ in the simplest form.

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46. $2\tan^{-1}\frac{1}{3} + \tan^{-1}\frac{1}{7} = \frac{\pi}{4}$

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47. Write in the simplest form : `tan^-1 (sin x/(1 + cos x))

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48. Prove that :

$$2\tan^{-1}\frac{1}{2}+\tan^{-1}\frac{1}{7}=\tan^{-1}\frac{31}{17}$$

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49. Write the $\tan^{-1}\left(\frac{\cos x}{1+\sin x}\right), -\frac{\pi}{2}<x<\frac{\pi}{2}$ in the simplest form.

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50. Prove that :

$$2\tan^{-1}\left(\frac{1}{5}\right)+\tan^{-1}\left(\frac{1}{8}\right)=\tan^{-1}\left(\frac{4}{7}\right)$$

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51. Solve:

$$\tan^{-1}(x+2)+\tan^{-1}(x-2)=\tan^{-1}\left(\frac{4}{19}\right), x>0$$

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52. Solve:

$$\tan^{-1}(x+3)+\tan^{-1}(x-3)=\tan^{-1}\left(\frac{4}{39}\right), x>0$$

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53. Solve:

$$\tan^{-1}(x+4)+\tan^{-1}(x-4)=\tan^{-1}\left(\frac{4}{67}\right), x>0$$

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54. Prove that :

$$2\tan^{-1}\frac{1}{5}+\tan^{-1}\frac{1}{4}=\tan^{-1}\frac{32}{43}$$

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55. Prove that : $\sin^{-1}\frac{3}{5}+\sin^{-1}\frac{8}{17}=\cos^{-1}\frac{36}{85}$

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56. Prove that :

$$2\tan^{-1}\left(\frac{1}{5}\right)+\tan^{-1}\left(\frac{1}{8}\right)=\tan^{-1}\left(\frac{4}{7}\right)$$

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57. Prove that :

$$\sin^{-1}\frac{5}{13}+\sin^{-1}\frac{7}{25}=\cos^{-1}\frac{253}{325}$$

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58. Prove that : $2\tan^{-1}\frac{1}{2}+\tan^{-1}\frac{1}{7}=\tan^{-1}\frac{31}{17}$

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59. Prove that :

$$\sin^{-1}\left(\frac{4}{5}\right)+\sin^{-1}\left(\frac{5}{13}\right)=\cos^{-1}\left(\frac{16}{25}\right)$$

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60. Prove that :

$$\tan^{-1}\left[\frac{\sqrt{1+x}-\sqrt{1-x}}{\sqrt{1}+x+\sqrt{1}-x}\right]=\frac{\pi}{4}-\frac{1}{2}\cos^{-1}x$$

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61. Prove that :

$$\tan^{-1}\left[\frac{\sqrt{1+x^2}-\sqrt{1-x^2}}{\sqrt{1}+x^2+\sqrt{1-x^2}}\right]=\frac{\pi}{4}-\frac{1}{2}\cos^{-1}x^2$$

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62. Prove that :

$$\tan^{-1}\left[\frac{\sqrt{1+x^2}-\sqrt{1-x^2}}{\sqrt{1}+x^2+\sqrt{1-x^2}}\right]=\frac{\pi}{4}-\frac{1}{2}\cos^{-1}x^2$$

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63. Solve the Equation :

$$\tan^{-1}\left(\frac{x-1}{x+2}\right)+\tan^{-1}\left(\frac{2x-1}{2x+1}\right)=\frac{\tan^{-1}23}{36}$$

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64. Solve the Equation :

$$\tan^{-1}\left(\frac{x+1}{x-1}\right)+\tan^{-1}\left(\frac{x-1}{x}\right)=\tan^{-1}(-7)$$

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65. Prove that :

$$\sin^{-1}\left(\frac{5}{13}\right)+\cos^{-1}\left(\frac{3}{5}\right)=\tan^{-1}\left(\frac{63}{16}\right)$$

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66. Prove that : $\cos^{-1}\frac{12}{13}+\sin^{-1}\frac{4}{5}=\tan^{-1}\frac{63}{16}$

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67. Solve for x:

$$\tan^{-1}(x+1)+\tan^{-1}(x-1)=\tan^{-1}\frac{8}{31}, x>0$$

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68. Solve:

$$\tan^{-1}(x+2)+\tan^{-1}(x-2)=\tan^{-1}\left(\frac{4}{19}\right), x>0$$

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69. Solve:

$$\tan^{-1}(x+2)+\tan^{-1}(x-2)=\tan^{-1}\left(\frac{4}{19}\right), x>0$$

Watch Video Solution

70. Solve for x:

$$\tan^{-1}(x+1)+\tan^{-1}(x-1)=\tan^{-1}\frac{8}{31}, x>0$$

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71. Solve for x:

$$\tan^{-1}\left(\frac{x}{2}\right) + \tan^{-1}\left(\frac{x}{3}\right) = \frac{\pi}{4}, x > 0$$

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72. Solve for x :

$$\tan^{-1}(x+2) + \tan^{-1}(x-2) = \frac{\pi}{4}, x > O$$

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73. Prove that :

$$2\tan^{-1}\left(\frac{1}{4}\right)+\tan^{-1}\left(\frac{1}{3}\right)=\tan^{-1}\left(\frac{39}{37}\right)$$

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74. Prove that :

$$2\tan^{-1}\frac{1}{2}+\tan^{-1}\frac{1}{7}=\tan^{-1}\frac{31}{17}$$

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75. Prove that :

$$2\tan^{-1}\left(\frac{1}{2}\right)+\tan^{-1}\left(\frac{1}{7}\right)=\tan^{-1}\left(\frac{31}{17}\right)$$

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76. Prove that :

$$2\tan^{-1}\left(\frac{1}{2}\right)+\tan^{-1}\left(\frac{1}{6}\right)=\tan^{-1}\left(\frac{27}{14}\right)$$

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77. Prove that : $2\tan^{-1}\frac{1}{7}+\tan^{-1}\frac{1}{3}=\tan^{-1}\frac{9}{13}$

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78. Prove that : $2\tan^{-1}\left(\frac{1}{5}\right)+\tan^{-1}\left(\frac{7}{17}\right)=\frac{\pi}{4}$

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79. $2\tan^{-1}\frac{1}{3}+\tan^{-1}\frac{1}{7}=\frac{\pi}{4}$

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80. Prove that : $2\tan^{-1}\left(\frac{1}{4}\right)+\tan^{-1}\left(\frac{7}{23}\right)=\frac{\pi}{4}$

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81. Show that : $\tan^{-1}\frac{1}{2}+\tan^{-1}\frac{1}{5}=\frac{1}{2}\cos^{-1}\frac{16}{25}$

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82. Show that :

$$\tan^{-1}\frac{1}{3}+\tan^{-1}\frac{1}{5}=\frac{1}{2}\cos^{-1}\frac{33}{65}$$

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83. Show that :

$$\tan^{-1}\frac{1}{2}+\tan^{-1}\frac{1}{4}=\frac{1}{2}\cos^{-1}\frac{13}{85}$$

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84. Show that $\cos^{-1}\frac{12}{13}+\sin^{-1}\frac{3}{5}=\sin^{-1}\frac{56}{65}$

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85. Prove that :

$$\sin^{-1}\left(\frac{5}{13}\right)+\cos^{-1}\left(\frac{3}{5}\right)=\sin^{-1}\left(\frac{63}{65}\right)$$

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86. Prove that :

$$\sin^{-1}\left(\frac{3}{5}\right)+\cos^{-1}\left(\frac{15}{17}\right)=\sin^{-1}\left(\frac{77}{85}\right)$$

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87. Prove that :

$$\sin^{-1}\left(\frac{5}{13}\right)+\cos^{-1}\left(\frac{4}{5}\right)=\frac{1}{2}\sin^{-1}\left(\frac{3696}{4225}\right).$$

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88. Prove that :

$$\cot^{-1}\left[\frac{\sqrt{1+\sin x}+\sqrt{1-\sin x}}{\sqrt{1}+\sin x+\sqrt{1-\sin x}}\right]=\frac{x}{2}, x\in\left(0,\frac{\pi}{4}\right)$$

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89. Prove that :

$$\sin^{-1}\left(\frac{3}{5}\right)+\cos^{-1}\left(\frac{5}{\sqrt{26}}\right)=\tan^{-1}\left(\frac{19}{17}\right)$$

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90. Prove that :

$$2\tan^{-1}\left(\frac{1}{2}\right)+\tan^{-1}\left(\frac{1}{5}\right)=\tan^{-1}\left(\frac{23}{11}\right)$$

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