INDIAN SCHOOL DARSAIT

Class XII — **Mathematics Worksheet**

Worksheet # 4 Inverse Trigonometric Functions

(Chapter – 2: Inverse Trigonometric Functions)

CLASS WORK

1.	Find the value of: i) $\text{Tan}^{-1}(1)+\cos^{-1}\left(-\frac{1}{2}\right)+\sin^{-1}\left(-\frac{1}{2}\right)$ ii) $\text{Tan}^{-1}\left(\sqrt{3}\right)-\text{Sec}^{-1}(-2)+\text{Cos}\,ec^{-1}\left(-\frac{2}{\sqrt{3}}\right)$ iii) $\text{Sin}^{-1}\left(-\frac{1}{2}\right)+2\text{Cos}^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ iv) $\text{Sin}^{-1}\sin\left(\frac{\pi}{3}-\text{Sin}^{-1}\left(-\frac{\sqrt{3}}{2}\right)\right)$ v) $\text{Cos}^{-1}\left(\frac{3}{5}\text{Cos}\,x+\frac{4}{5}\text{Sin}\,x\right)$
2.	Evaluate: i) $\text{Sin}^{-1}\sin\left(\frac{\pi}{3}\right)$ ii) $\text{Cos}^{-1}\cos\left(\frac{2\pi}{3}\right)$ iii) $Ta\,\text{n}^{-1}\text{Tan}\left(\frac{3\pi}{4}\right)$ iv) $\text{Cos}^{-1}\cos\left(\frac{7\pi}{6}\right)$ v) $\text{Sin}^{-1}\sin\left(\frac{2\pi}{3}\right)+\text{Cos}^{-1}\cos\left(\frac{2\pi}{3}\right)$ vi) $\text{Cos}^{-1}\cos\left(\frac{13\pi}{6}\right)+Ta\,\text{n}^{-1}\text{Tan}\left(\frac{5\pi}{6}\right)$
3.	Evaluate: i) $\text{Sin}\left[2\text{Cos}^{-1}\left(Cot\left(2\text{Tan}^{-1}x\right)\right)\right]=0$ ii) $\text{Cos}\left(\text{Sec}^{-1}x+\text{Cos}\,ec^{-1}x\right)$
4.	Find the value of: i) $\text{Sin}\left(\text{Tan}^{-1}x\right)$ ii) $\text{Cos}\left(Cot^{-1}x\right)$
5.	Simplify: $\text{Tan}^{-1}\frac{x}{y}-\text{Tan}^{-1}\frac{x-y}{x+y}$
6.	Simplify: i) $Ta\,\text{n}^{-1}\sqrt{\frac{1-\cos x}{1+\cos x}}$, -π<x<π ii) $Ta\,\text{n}^{-1}\left(\frac{\text{Cos}\,x}{1+\text{Sin}\,x}\right), -\pi/2<x<\pi/2$ iii) $Ta\,\text{n}^{-1}\left(\frac{\text{Cos}\,x}{1-\text{Sin}\,x}\right), -\pi/2<x<\pi/2$ iv) $Ta\,\text{n}^{-1}\sqrt{\frac{a-x}{a+x}}$, -a<x<a
7.	Simplify: i) $Ta\,\text{n}^{-1}\left(\frac{\text{Cos}\,x-\text{Sin}\,x}{\text{Cos}\,x+\text{Sin}\,x}\right) -\pi/4<x<\pi/4$, ii) $Ta\,\text{n}^{-1}\left(\frac{a\,\text{Cos}\,x-b\,\text{Sin}\,x}{b\,\text{Cos}\,x+a\,\text{Sin}\,x}\right)$ iii) $Ta\,\text{n}^{-1}\left(\frac{3a^2x-x^3}{a^3-3ax^2}\right)$ iv) $\text{Tan}^{-1}\left[\frac{\sqrt{1+x^2}+1}{x}\right]$ v) $\text{Tan}^{-1}\left[\sqrt{1+x^2}-x\right]$ vi) $\text{Sin}\left[2\tan^{-1}\sqrt{\frac{1-x}{1+x}}\right]$
	Prove the following: -
8.	i) $\text{Sin}^{-1}\frac{8}{17}+\text{Sin}^{-1}\frac{3}{5}=\text{Sin}^{-1}\frac{77}{85}$ ii) $\text{Cos}^{-1}\frac{12}{13}+\text{Sin}^{-1}\frac{3}{5}=\text{Sin}^{-1}\frac{56}{65}$
9.	i) $\text{Sin}^{-1}\frac{12}{13}+\text{Cos}^{-1}\frac{4}{5}+\text{Tan}^{-1}\frac{63}{16}=\pi$ ii) $\text{Sin}^{-1}\frac{4}{5}+\text{Sin}^{-1}\frac{5}{13}+\text{Sin}^{-1}\frac{16}{65}=\frac{\pi}{2}$
10.	$\text{Tan}\left(\frac{1}{2}\text{Sin}^{-1}\frac{3}{4}\right)=\frac{4-\sqrt{7}}{3}$
11.	i) $\text{Tan}^{-1}\frac{2}{11}+\text{Tan}^{-1}\frac{7}{24}=\text{Tan}^{-1}\frac{1}{2}$ ii) $\text{Tan}^{-1}2+\text{Tan}^{-1}3=\frac{3\pi}{4}$
12.	i) $\text{Tan}^{-1}\frac{1}{5}+\text{Tan}^{-1}\frac{1}{7}+\text{Tan}^{-1}\frac{1}{3}+\text{Tan}^{-1}\frac{1}{8}=\frac{\pi}{4}$ ii) $\text{Tan}^{-1}\frac{1}{4}+\text{Tan}^{-1}\frac{2}{9}=\frac{1}{2}\text{Cos}^{-1}\frac{3}{5}$
13.	i) $2\text{Tan}^{-1}\frac{1}{5}+\text{Tan}^{-1}\frac{1}{8}=\text{Tan}^{-1}\frac{4}{7}$ ii) $2\text{Tan}^{-1}\frac{1}{3}+\text{Sin}^{-1}\frac{4}{5}=\frac{\pi}{2}$
14.	i) $2\text{Tan}^{-1}\frac{1}{5}+\text{Sec}^{-1}\frac{5\sqrt{2}}{7}+2\text{Tan}^{-1}\frac{1}{8}=\frac{\pi}{4}$ ii) $Cot^{-1}7+Cot^{-1}8+Cot^{-1}18=Cot^{-1}3$

INDIAN SCHOOL DARSAIT

Class XII — **Mathematics Worksheet**

Worksheet # 4 Inverse Trigonometric Functions

(Chapter – 2: Inverse Trigonometric Functions)

15.	$\text{Tan}^{-1}\left[\frac{\sqrt{1+x^2}+\sqrt{1-x^2}}{\sqrt{1+x^2}-\sqrt{1-x^2}}\right]=\frac{\pi}{4}+\frac{1}{2}\text{Cos}^{-1}x^2$
16.	i) $\text{Tan}^{-1}\left[\frac{\sqrt{1+x}-\sqrt{1-x}}{\sqrt{1+x}+\sqrt{1-x}}\right]=\frac{\pi}{4}-\frac{1}{2}\text{Cos}^{-1}x$ ii $Cot^{-1}\left[\frac{\sqrt{1+\text{Sin}\,x}+\sqrt{1-\text{Sin}\,x}}{\sqrt{1+\text{Sin}\,x}-\sqrt{1-\text{Sin}\,x}}\right]=\frac{x}{2}$
	Solve the following: -
17.	If $\text{Tan}^{-1}x=\frac{\pi}{10}$, x ∈ R, find the value $Cot^{-1}x$
18.	If $3\text{Tan}^{-1}x+\cot^{-1}x=\pi$, find the value of x
19.	i) $\text{Tan}^{-1}2x+\text{Tan}^{-1}3x=\frac{\pi}{4}$ ii) $\text{Tan}^{-1}\left(\frac{x-1}{x-2}\right)+\text{Tan}^{-1}\left(\frac{x+1}{x+2}\right)=\frac{\pi}{4}$ iii) $\text{Tan}^{-1}\left(\frac{x-1}{x+1}\right)+\text{Tan}^{-1}\left(\frac{2x-1}{2x+1}\right)=\text{Tan}^{-1}\left(\frac{23}{36}\right)$ iv) $\cot^{-1}\frac{1}{x+1}+Cot^{-1}\frac{1}{x-1}=\text{Tan}^{-1}3x-\text{Tan}^{-1}x$
20.	i) $\text{Tan}^{-1}\left(\frac{1-x}{1+x}\right)=\frac{1}{2}\text{Tan}^{-1}x,\ x>0$ ii) $2\text{Tan}^{-1}\text{Cos}\,x=\text{Tan}^{-1}(2\cos ecx)$
21.	i) $\text{Sin}^{-1}(1-x)-2\text{Sin}^{-1}x=\frac{\pi}{2}$ ii) $\text{Sin}^{-1}x+\text{Sin}^{-1}(1-x)=\text{Cos}^{-1}x$
22.	i) $\text{Sin}^{-1}6x+\text{Sin}^{-1}6\sqrt{3}x=-\frac{\pi}{2}$ ii) $\text{Tan}^{-1}\left(\frac{1-x}{1+x}\right)-\frac{1}{2}\text{Tan}^{-1}x=0,\ x>0$ iii) $\left(\text{Tan}^{-1}x\right)^2+\left(\text{Co}\,t^{-1}x\right)^2=\frac{5\pi^2}{8}$
23.	If $\text{Tan}^{-1}x+\text{Tan}^{-1}y=\frac{4\pi}{5}$, find the value of $Cot^{-1}x+Cot^{-1}y$
24.	Evaluate: $\text{Tan}^{-1}\left[\frac{3\text{Sin}\,2\alpha}{5+3\text{Cos}\,2\alpha}\right]+\text{Tan}^{-1}\left(\frac{1}{4}\text{Tan}\,\alpha\right)$
25.	Prove that $\text{Tan}\left[\frac{\pi}{4}+\frac{1}{2}\text{Cos}^{-1}\left(\frac{a}{b}\right)\right]+\text{Tan}\left[\frac{\pi}{4}-\frac{1}{2}\text{Cos}^{-1}\left(\frac{a}{b}\right)\right]=\frac{2b}{a}$
26.	If a > b > c > 0, prove that $Cot^{-1}\left(\frac{ab+1}{a-b}\right)+Cot^{-1}\left(\frac{bc+1}{b-c}\right)+Cot^{-1}\left(\frac{ca+1}{c-a}\right)=\pi$
27.	If $\text{Cos}^{-1}\left(\frac{x}{a}\right)+\text{Cos}^{-1}\left(\frac{y}{b}\right)=\alpha$, prove that $\frac{x^2}{a^2}-\frac{2xy\cos\alpha}{ab}+\frac{y^2}{b^2}=\text{Sin}^2\alpha$
28.	If $\text{Cos}^{-1}x+\text{Cos}^{-1}y+\text{Cos}^{-1}z=\pi$, prove that $x^2+y^2+z^2+2xyz=1$
29.	If $\text{Tan}^{-1}x+\text{Tan}^{-1}y+\text{Tan}^{-1}z=\frac{\pi}{2}$, prove that xy +yz +zx = 1
30.	Prove that $2\text{Tan}^{-1}\left[\sqrt{\frac{a-b}{a+b}}\tan\left(\frac{x}{2}\right)\right]=\text{Cos}^{-1}\left[\frac{b+a\text{Cos}\,x}{a+b\text{Cos}\,x}\right]$
31.	Prove that $\frac{9\pi}{8}-\frac{9}{4}\text{Sin}^{-1}\left(\frac{1}{3}\right)=\frac{9}{4}\text{Sin}^{-1}\left(\frac{2\sqrt{2}}{3}\right)$
32.	Prove that $\text{Tan}\frac{1}{2}\left[\text{Sin}^{-1}\left(\frac{2x}{1+x^2}\right)+\text{Cos}^{-1}\left(\frac{1-y^2}{1+y^2}\right)\right]=\frac{x+y}{1-xy}$

INDIAN SCHOOL DARSAIT

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(Chapter – 2: Inverse Trigonometric Functions)

33.	Find the greatest and least values of $\left(\text{Sin}^{-1}x\right)^2+\left(\text{Cos}^{-1}x\right)^2$
34.	If $\alpha=1+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}.....\infty$ and $\beta=1+\frac{1}{3}+\frac{1}{9}+\frac{1}{27}.....\infty$ are two geometric series, find the value of $\text{Sec}^{-1}\alpha+\text{Sec}^{-1}\beta$
35.	If $a_1,a_2,a_3,.....$ are in A.P with common difference d, evaluate $\text{Tan}\left[\tan^{-1}\left(\frac{d}{1+a_1a_2}\right)+\tan^{-1}\left(\frac{d}{1+a_2a_3}\right)+.....+\tan^{-1}\left(\frac{d}{1+a_{n-1}a_n}\right)\right]$
	HOME WORK
36.	Evaluate : i) $\text{Sin}^{-1}\sin\left(\frac{3\pi}{5}\right)+\text{Cos}^{-1}\cos\left(\frac{13\pi}{6}\right)$ ii) $Tan^{-1}\text{Tan}\left(\frac{7\pi}{4}\right)+\text{Cos}ec^{-1}\cos ec\left(\frac{13\pi}{4}\right)$
37.	Find the value of : i) $\cos^{-1}\left(\frac{1}{2}\right)+2\sin^{-1}\left(\frac{1}{2}\right)$ ii) $\text{Sin}^{-1}\left(\frac{1}{2}\right)-2\sin^{-1}\left(\frac{1}{\sqrt{2}}\right)$ iii) $\text{Tan}^{-1}(-1)+\text{Cos}^{-1}\left(-\frac{1}{\sqrt{2}}\right)$ iv) $\text{Sin}^{-1}\left(-\frac{\sqrt{3}}{2}\right)+\text{Cos}^{-1}\left(\frac{\sqrt{3}}{2}\right)$
38.	Find the value of : i) $\text{Sin}\left(\frac{1}{2}\text{Cos}^{-1}\frac{4}{5}\right)$ ii) $\text{Sin}\left(\text{Tan}^{-1}x+Cot^{-1}x\right)$
39.	Simplify: i) $\text{Cos}^{-1}\left(\frac{x}{\sqrt{a^2+x^2}}\right)$ ii) $S\text{in}^{-1}\left(\frac{\text{Sin}\,x+\text{Cos}\,x}{\sqrt{2}}\right), -\pi/4<x<\pi/4$ iii) $Ta\text{n}^{-1}\left(\frac{x}{\sqrt{a^2-x^2}}\right)$, -a<x<a iv) $\sin^{-1}\left(\frac{x}{\sqrt{a^2+x^2}}\right)\text{Tan}^{-1}\left[x+\sqrt{1+x^2}\right]$ v) $\text{Tan}^{-1}\left[\frac{\sqrt{1+x^2}+1}{x}\right]$ vi) $Cot^{-1}\left[\frac{a}{\sqrt{a^2-x^2}}\right]$ vii) $\text{Tan}^{-1}\left(\frac{2\sqrt{x}}{1-x}\right)$
40.	Simplify: i) $\text{Cos}^{-1}\left(\frac{\text{Sin}\,x+\text{Cos}\,x}{\sqrt{2}}\right), \pi/4<x<5\pi/4$ ii) $Ta\text{n}^{-1}\left(\frac{a+bx}{a-bx}\right)$
	Prove the following: -
41.	i) $\text{Cos}^{-1}\frac{12}{13}+C\text{os}^{-1}\frac{4}{5}=\text{Cos}^{-1}\frac{33}{65}$ ii) $\text{Sin}^{-1}\frac{3}{5}-\text{Sin}^{-1}\frac{8}{17}=\text{Cos}^{-1}\frac{84}{85}$
42.	i) $\text{Tan}^{-1}\frac{1}{7}+\text{Tan}^{-1}\frac{1}{13}=\text{Tan}^{-1}\frac{2}{9}$ ii) $\text{Tan}^{-1}\frac{1}{2}+\text{Tan}^{-1}\frac{1}{5}+\text{Tan}^{-1}\frac{1}{8}=\frac{\pi}{4}$
43.	$\text{Tan}^{-1}1+\text{Tan}^{-1}2+\text{Tan}^{-1}3=2\left(\text{Tan}^{-1}1+\text{Tan}^{-1}\frac{1}{2}+\text{Tan}^{-1}\frac{1}{3}\right)$
44.	$\text{Tan}^{-1}\left[\frac{\sqrt{1+x^3}-\sqrt{1-x^3}}{\sqrt{1+x^3}+\sqrt{1-x^3}}\right]=\frac{\pi}{4}-\frac{1}{2}\text{Cos}^{-1}x^3$
45.	$\text{Tan}^{-1}\left[\frac{\sqrt{1+\text{Cos}\,x}+\sqrt{1-\text{Cos}\,x}}{\sqrt{1+\text{Cos}\,x}-\sqrt{1-\text{Cos}\,x}}\right]=\frac{\pi}{4}+\frac{x}{2}$

INDIAN SCHOOL DARSAIT

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(Chapter – 2: Inverse Trigonometric Functions)

46.	i) $\text{Tan}^{-1}\left(\frac{x-2}{x-4}\right)+\text{Tan}^{-1}\left(\frac{x+2}{x+4}\right)=\frac{\pi}{4}$ ii) $\text{Tan}^{-1}\left(\frac{x+1}{x-1}\right)+\text{Tan}^{-1}\left(\frac{x-1}{x}\right)=\text{Tan}^{-1}(-7)$
47.	i) $\text{Tan}^{-1}\frac{1}{2x+1}+\text{Tan}^{-1}\frac{1}{4x+1}=\text{Tan}^{-1}\frac{2}{x^2}$
48.	$\text{Sin}^{-1}3x+\text{Sin}^{-1}3\sqrt{3}x=-\frac{\pi}{2}$
49.	i) $\text{Tan}^{-1}(x-1)+\text{Tan}^{-1}(x+1)=\text{Tan}^{-1}\frac{8}{31}$ ii) $\text{Tan}^{-1}(x-1)+\text{Tan}^{-1}x+\text{Tan}^{-1}(x+1)=\text{Tan}^{-1}3x$
50.	Prove that $\text{Cos}^{-1}x=2\text{Sin}^{-1}\sqrt{\frac{1-x}{2}}=2\text{Cos}^{-1}\sqrt{\frac{1+x}{2}}$
51.	If $\text{Cos}^{-1}\left(\frac{x}{2}\right)+\text{Cos}^{-1}\left(\frac{y}{3}\right)=\alpha$, prove that $9x^2-12xy\,\text{Cos}\,\alpha+4y^2=36\,\text{Sin}^2\alpha$
52.	If $\text{Tan}^{-1}x+\text{Tan}^{-1}y+\text{Tan}^{-1}z=\pi$, prove that x + y + z = xyz
53.	Prove that $\text{Cos}^{-1}x+\text{Cos}^{-1}\left[\frac{x}{2}+\frac{\sqrt{3-3x^2}}{2}\right]=\frac{\pi}{3}$
54.	If $\text{Tan}^{-1}\left(\sqrt{\frac{1-\sqrt{x}}{1+\sqrt{x}}}\right)=\frac{\pi}{4}-\frac{\alpha}{2}$, show that $x=\text{Sin}^2\alpha$
55.	If $\text{Sin}^{-1}\frac{2a}{1+a^2}+\text{Sin}^{-1}\frac{2b}{1+b^2}=2\tan^{-1}x$, prove that $x=\frac{a+b}{1-ab}$
56.	Prove that $\text{Tan}^{-1}\sqrt{x}=\frac{1}{2}\cos^{-1}\left(\frac{1-x}{1+x}\right)$
57.	If $\text{Sin}^{-1}x+\text{Sin}^{-1}y=\frac{\pi}{2}$, find the value of $\text{Cos}^{-1}x+\text{Cos}^{-1}y$
	SELF STUDY
58.	Evaluate i) $\text{Cos}^{-1}\left(\frac{3}{5}\text{Cos}\,x+\frac{4}{5}\text{Sin}\,x\right)$ ii) $Cot\left(\text{Tan}^{-1}a+Cot^{-1}a\right)$
59.	Evaluate : i) $\text{Sin}^{-1}\left(\frac{5}{13}\text{Cos}\,x+\frac{12}{13}\text{Sin}\,x\right)$ ii) $\text{Sin}\left(\text{Tan}^{-1}x+Cot^{-1}x\right)$ iii) $\text{Cos}\,ec\left(\text{Cos}^{-1}\left(-\frac{12}{13}\right)\right)$
60.	Simplify : $\text{Sin}^{-1}\left(x\sqrt{1-x}-\sqrt{x}\sqrt{1-x^2}\right)$
61.	Simplify : i) $\text{Tan}^{-1}\left[\frac{x}{a+\sqrt{a^2-x^2}}\right]$ ii) $\text{Sin}^{-1}\left[\frac{x+\sqrt{1-x^2}}{\sqrt{2}}\right]$ iii) $\text{Sin}^{-1}\left[\frac{\sqrt{1+x}+\sqrt{1-x}}{2}\right]$
	Prove the following:-
62.	$\text{Tan}^{-1}\frac{3}{4}+\text{Tan}^{-1}\frac{3}{5}-\text{Tan}^{-1}\frac{8}{19}=\frac{\pi}{4}$
	Solve the following:-
63.	i) $\text{Tan}^{-1}\frac{x}{2}+\text{Tan}^{-1}\frac{x}{3}=\frac{\pi}{4},\sqrt{6}>x>0$ ii) $2\,\text{Tan}^{-1}\text{Sin}\,x=\text{Tan}^{-1}(\text{s}\,ecx),\ x\neq\frac{\pi}{2}$

INDIAN SCHOOL DARSAIT

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64.	$\text{Tan}^{-1}(x+2)+\text{Tan}^{-1}(x-2)=\text{Tan}^{-1}\frac{8}{79}$
65.	$\text{Tan}^{-1}\frac{1}{4}+2\,\text{Tan}^{-1}\frac{1}{5}+\text{Tan}^{-1}\frac{1}{6}+\text{Tan}^{-1}\frac{1}{x}=\frac{\pi}{4}$
66.	$\text{Tan}\left(\text{Cos}^{-1}x\right)=\text{Sin}\left(Cot^{-1}\frac{1}{2}\right)$
67.	$\text{Cos}\left(\text{tan}^{-1}x\right)=\text{Sin}\left(Cot^{-1}\frac{3}{4}\right)$
68.	$\text{Tan}^{-1}\left(\frac{1-x}{1+x}\right)=\frac{\pi}{4}+\text{Tan}^{-1}x$
69.	$\text{Tan}^{-1}x-Cot^{-1}x=\text{Tan}^{-1}\frac{1}{\sqrt{3}}$
70.	$\text{Sin}\left(\text{Sin}^{-1}\frac{1}{5}+\text{Cos}^{-1}x\right)=1$
71.	Prove that $\text{Tan}^{-1}x+\text{Tan}^{-1}\frac{2x}{1-x^2}=\text{Tan}^{-1}\left(\frac{3x-x^3}{1-3x^2}\right)$
72.	Prove that $\text{Tan}^{-1}\left(\frac{2ab}{a^2-b^2}\right)+\text{Tan}^{-1}\left(\frac{2xy}{x^2-y^2}\right)=\text{Tan}^{-1}\left(\frac{2\alpha\beta}{\alpha^2-\beta^2}\right)$ where $\alpha=ax-by$ and $\beta=ay+bx$
73.	For a, b, x, y >0, prove that $\frac{2}{3}\text{Tan}^{-1}\left(\frac{3ab^2-a^3}{b^3-3a^2b}\right)+\frac{2}{3}\text{Tan}^{-1}\left(\frac{3xy^2-x^3}{y^3-3x^2y}\right)=\text{Tan}^{-1}\left(\frac{2\alpha\beta}{\alpha^2-\beta^2}\right)$ where $\alpha=by-ax\ \ \beta=bx+ay$
74.	Prove that $\text{Cos}^{-1}\left[\frac{\text{Cos}\alpha+\text{Cos}\beta}{1+\text{Cos}\alpha\,\text{Cos}\beta}\right]=2\,\text{Tan}^{-1}\left[\tan\left(\alpha/2\right)\tan\left(\beta/2\right)\right]$
75.	If $y=Cot^{-1}\sqrt{\text{Cos}x}-\text{Tan}^{-1}\sqrt{\text{Cos}x}$, prove that $\text{Sin}\,y=\text{Tan}^2\left(x/2\right)$
76.	Show that $2\,\text{Tan}^{-1}\left[\text{Tan}\left(\alpha/2\right)\tan\left(\frac{\pi}{4}-\frac{\beta}{2}\right)\right]=\text{Tan}^{-1}\left[\frac{\text{Sin}\alpha\,\text{Cos}\beta}{\text{Cos}\alpha+\text{Sin}\beta}\right]$
77.	Prove that $\sum_{m=1}^{n}\tan^{-1}\left(\frac{2m}{m^4+m^2+2}\right)=\tan^{-1}\left(\frac{n^2+n}{n^2+n+2}\right)$
78.	Find the value of $\sum_{x=0}^{n}\tan^{-1}\left(\frac{1}{1+x+x^2}\right)$
79.	If $\text{Cos}^{-1}\alpha+\text{Cos}^{-1}\beta+\text{Cos}^{-1}\gamma=3\pi$, find the value of $\alpha(\beta+\gamma)+\beta(\gamma+\alpha)+\gamma(\alpha+\beta)$
80.	Prove that $\text{Tan}^{-1}\left(\frac{yz}{xr}\right)+\text{Tan}^{-1}\left(\frac{xz}{yr}\right)+\text{Tan}^{-1}\left(\frac{xy}{zr}\right)=\frac{\pi}{2}$, where $x^2+y^2+z^2=r^2$
81.	If x, y and z $\in[-1,1]$ such that $\text{Sin}^{-1}x+\text{Sin}^{-1}y+\text{Sin}^{-1}z=\frac{3\pi}{2}$, find the value of $x^{2006}+y^{2007}+z^{2008}+\frac{9}{x^{2006}+y^{2007}+z^{2008}}$