



INDIAN SCHOOL AL WADI AL KABIR

PO 513, PC 117, WADI KABIR, SULTANATE OF OMAN
Department of Mathematics, 2020-2021

CLASS: XII

Worksheet- Inverse Trigonometry

26-04-2020

OBJECTIVE TYPE (1 Mark)

Q.1.	The principal value of $\tan^{-1}\left(\tan\frac{9\pi}{8}\right)$ is							
A	$\frac{9\pi}{8}$	B	$\frac{\pi}{8}$	C	$-\frac{9\pi}{8}$	D	$-\frac{\pi}{8}$	
Q.2.	The value of $2\cos^{-1}\frac{1}{2} + 3\sin^{-1}\frac{1}{2}$ is							
A	$\frac{7\pi}{6}$	B	$\frac{\pi}{6}$	C	$\frac{2\pi}{3}$	D	π	
Q.3.	The value of $\tan^{-1}\left[2\cos\left(2\sin^{-1}\frac{1}{2}\right)\right]$ is							
A	$\frac{7\pi}{4}$	B	0	C	$\frac{3\pi}{4}$	D	$\frac{\pi}{4}$	
Q.4.	$\sin[\cot^{-1}\{\cos(\tan^{-1}x)\}] =$							
A	$\frac{x}{\sqrt{x^2+1}}$	B	$\frac{1}{\sqrt{x^2+1}}$	C	$\sqrt{\frac{x^2+1}{x^2+2}}$	D	$\frac{1}{\sqrt{x^2+2}}$	
Q.5.	If $3\sin^{-1}\left(\frac{2x}{1+x^2}\right) - 4\cos^{-1}\left(\frac{1-x^2}{1+x^2}\right) + 2\tan^{-1}\left(\frac{2x}{1-x^2}\right) = \frac{\pi}{3}$, then x=							
A	$\frac{1}{\sqrt{3}}$	B	$\frac{1}{\sqrt{2}}$	C	$\sqrt{3}$	D	1	
Q.6.	If $\tan^{-1}(2x) + \tan^{-1}(3x) = \frac{\pi}{4}$, then x=							
A	1 and $-\frac{1}{6}$	B	-1 and $\frac{1}{6}$	C	$\frac{1}{6}$	D	-1 and $-\frac{1}{6}$	
Q.7.	If $\sin^{-1}x + \cos^{-1}y = \frac{\pi}{5}$, then $\cos^{-1}x + \sin^{-1}y =$							
A	$\frac{\pi}{5}$	B	$\frac{4\pi}{5}$	C	$\frac{6\pi}{5}$	D	$\frac{\pi}{5}$	

Q.8.	$\sin\left(2\cos^{-1}\left(-\frac{3}{5}\right)\right) =$							
A	$-\frac{24}{25}$	B	$\frac{24}{25}$	C	$-\frac{3}{5}$	D	$\frac{4}{5}$	
Q.9.	If $\tan^{-1}x + 2\cot^{-1}x = \frac{2\pi}{3}$, then x =							
A	$\frac{1}{\sqrt{3}}$	B	$\frac{1}{\sqrt{2}}$	C	$\sqrt{3}$	D	1	
Q.10	$\cos^{-1}\left(\cos\frac{2\pi}{3}\right) + \sin^{-1}\left(\sin\frac{2\pi}{3}\right) =$							
A	$\frac{\pi}{2}$	B	$\frac{\pi}{3}$	C	$\frac{4\pi}{3}$	D	π	
Fill in the blanks(1mark)								
Q11.	$\tan\left[\sin^{-1}\left(\frac{3}{5}\right) + \tan^{-1}\left(\frac{3}{4}\right)\right] = \dots\dots\dots$							
Q12.	$\sec^2(\tan^{-1}2) + \operatorname{cosec}^2(\cot^{-1}3) = \dots\dots\dots$							
Q13.	If $\tan^{-1}\left(\frac{1-x}{1+x}\right) = \frac{1}{2}\tan^{-1}x$, then x =							
Q14.	If $a_1, a_2, a_3, \dots, a_n$ is an AP with common difference d, then: $\tan\left(\tan^{-1}\left(\frac{d}{1+a_1a_2}\right) + \tan^{-1}\left(\frac{d}{1+a_2a_3}\right) + \tan^{-1}\left(\frac{d}{1+a_3a_4}\right) + \dots + \tan^{-1}\left(\frac{d}{1+a_{n-1}a_n}\right)\right) = \dots\dots\dots$							
Q15.	$\tan^{-1}1 + \tan^{-1}2 + \tan^{-1}3 = \dots\dots\dots$							
SECTION B (2 marks)								
Q16.	If $\tan^{-1}a + \tan^{-1}b + \tan^{-1}c = \pi$, prove $a+b+c = abc$							
Q17.	Simplify: $\tan^{-1}\left[\frac{\cos x}{1-\sin x}\right], -\frac{3\pi}{2} < x < \frac{\pi}{2}$							
Q18.	Which is greater $\tan 1$ or $\tan^{-1}1$? Why?							
Q19.	Solve: $\tan^{-1}(x+1) + \tan^{-1}(x-1) = \tan^{-1}\frac{8}{31}$							
Q20.	Solve for x : $(\tan^{-1}x)^2 + (\cot^{-1}x)^2 = \frac{5\pi^2}{8}$							

SECTION C (4marks)

Q21. Prove: $\tan\left(\frac{\pi}{4} + \frac{1}{2}\cos^{-1}\frac{a}{b}\right) + \tan\left(\frac{\pi}{4} - \frac{1}{2}\cos^{-1}\frac{a}{b}\right) = \frac{2b}{a}$

Q22. Solve: $\sin^{-1}(6x) + \sin^{-1}(6\sqrt{3}x) = -\frac{\pi}{2}$

Q23. Prove: $2\tan^{-1}\left(\sqrt{\frac{a-b}{a+b}}\tan\frac{\theta}{2}\right) = \cos^{-1}\left(\frac{a\cos\theta+b}{a+b\cos\theta}\right)$.

Q24. Prove: $\cos^{-1}x + \cos^{-1}\left(\frac{x}{2} + \frac{\sqrt{3-3x^2}}{2}\right) = \frac{\pi}{3}$

Q25. Prove: $\tan\left[\frac{1}{2}\sin^{-1}\left(\frac{3}{5}\right)\right] = \frac{4-\sqrt{7}}{3}$.

Answers will be uploaded on 30th April 2020

Answers
