National Institute of Open Schooling
Senior Secondary Course : Mathematics
Lesson 24 : Inverse Trigonometric Functions
Worksheet – 24

1. Find out the domain and principal values range of all inverse trigonometry functions and observe the relations among them.
2. Prove that: $2\tan^{-1}\frac{1}{3}+\tan^{-1}\frac{1}{7}=\frac{\pi}{4}$ by using the properties of inverse trigonometric functions.
3. Find out The principal value of following:
   i. $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$
   ii. $\tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$
   iii. $\tan\left(\cot^{-1}\sqrt{3}\right)$
4. List out properties of inverse trigonometry functions and prove any three properties of inverse trigonometry functions.
5. Prove that : $2\tan^{-1}\frac{1}{3}+\tan^{-1}\frac{1}{2}=\tan^{-1}2$
6. Draw the graph of $\sin^{-1}x$ and $\cos^{-1}x$ and write your mathematical observations from this two graphs.
7. $2\tan^{-1}\frac{1}{4}+2\tan^{-1}\frac{2}{9}=\tan^{-1}\frac{4}{3}$, Prove by using the properties of inverse trigonometric functions.
8. If $\cos^{-1}x + \cos^{-1}y + \cos^{-1} = \Pi$, show that $x^2 + y^2 + z^2 = 1- 2xyz$
9. Prove that $\text{Cos}^{-1}(2x^2 -1) = 2\ \text{Cos}^{-1}x$ by using the properties of inverse trigonometric functions.
10. Write the conditions of trigonometric functions are to be invertible. Cite any thee examples of invertible inverse trigonometric function.