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## MATHEMATICS - XII STANDARD

### CHAPTER - 4 [IMPORTANT QUESTIONS]

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1) Find the principal value of $\sin^{-1}(-1/2)$

2) Find the principal value of $\sin^{-1}(2)$, if it exists

3) Find the domain of $\sin^{-1}(2-3x^2)$

4) Find the period and amplitude of $y = -\sin(1/3)x$

5) For what values of $x$ does $\sin x = \sin^{-1}x$ ?

6) Find the domain of $\cos^{-1}\left(\dfrac{2+\sin x}{3}\right)$.

7) Is $\cos^{-1}(-x) = \pi - \cos^{-1}(x)$ true ? Justify your answer

8) Find the value of $\tan^{-1}(-1) + \cos^{-1}(1/2) + \sin^{-1}(-1/2)$

9) Prove that $\tan(\sin^{-1}x) = \dfrac{x}{\sqrt{1-x^2}}$, $-1 < x < 1$

10) If $\cot^{-1}(1/7) = \theta$, find the value of $\cos\theta$

11) Show that $\cot^{-1}\left(\dfrac{1}{\sqrt{x^2-1}}\right) = \sec^{-1}x$, $|x| > 1$

12) Find the principal value of $\cot^{-1}(\sqrt{3})$

13) Simplify i) $\sin^{-1}[\sin 10]$  ii) $\sin^{-1}[\sin 5]$

14) Find the value of $\cos\left[\frac{1}{2}\cos^{-1}(1/8)\right]$

15) Evaluate $\sin\left[\sin^{-1}(3/5) + \sec^{-1}(4/5)\right]$

16) If $\cos^{-1}x + \cos^{-1}y + \cos^{-1}z = \pi$ and $0 < x, y, z < 1$, show that $x^2+y^2+z^2+2xyz = 1$

17) If $a_1, a_2, a_3 \ldots a_n$ is an arithmetic progression with common difference $d$, prove that $\tan\left[\tan^{-1}\left(\dfrac{d}{1+a_1 a_2}\right) + \tan^{-1}\left(\dfrac{d}{1+a_2 a_3}\right) + \ldots + \tan^{-1}\left(\dfrac{d}{1+a_n a_{n-1}}\right)\right] = \dfrac{a_n - a_1}{1+a_n a_1}$

18) Solve $\tan^{-1}\left(\dfrac{1-x}{1+x}\right) = \frac{1}{2}\tan^{-1}x$ for $x>0$

19) $\tan^{-1}\left(\dfrac{x-1}{x-2}\right) + \tan^{-1}\left(\dfrac{x+1}{x+2}\right) = \pi/4$

20) Find the number of solutions of the equations $\tan^{-1}(x-1) + \tan^{-1}x + \tan^{-1}(x+1) = \tan^{-1}(3x)$

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G. Rajesh M.SC, B.Ed., MBA.,
M.SC (psh), MA (Yoga), MA (Eco),
MA (Tam) Dept of mathematics