NCERT MATHS SOLUTIONS

Class - 12 || INVERSE TRIGONOMETRIC FUNCTIONS

Ques No.	Question
1	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 1** Find the principal value of: $\sin^{-1}\left(-\frac{1}{2}\right)$ Watch Free Video Solution on Doubtnut
2	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 2** Find the principal value of: $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$ Watch Free Video Solution on Doubtnut
3	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 3** Find the principal value of: $\cos ec^{-1}(2)$ Watch Free Video Solution on Doubtnut
4	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 4** Find the principal value of: $\tan^{-1}(-\sqrt{3})$ Watch Free Video Solution on Doubtnut
5	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 5** Find the principal value of: $\cos^{-1}\left(-\frac{1}{2}\right)$ Watch Free Video Solution on Doubtnut

6	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 6** Find the principal value of: $\tan^{-1}(-1)$ Watch Free Video Solution on Doubtnut
7	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 7** Find the principal value of: $\sec^{-1}\left(\frac{2}{\sqrt{3}}\right)$ Watch Free Video Solution on Doubtnut
8	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 8** Find the principal value of: $\cot^{-1}(\sqrt{3})$ Watch Free Video Solution on Doubtnut
9	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 9** Find the principal value of: $\cos^{-1}\left(-\frac{1}{\sqrt{2}}\right)$ Watch Free Video Solution on Doubtnut
10	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 10** Find the principal value of: $\cos ec^{-1}(-\sqrt{2})$ Watch Free Video Solution on Doubtnut

11	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 11** Find the value of: $\tan^{-1}(1)$ $+\cos^{-1}\left(-\frac{1}{2}\right)$ $+\sin^{-1}\left(-\frac{1}{2}\right)$ Watch Free Video Solution on Doubtnut

12	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 12** Find the value of: $\cos^{-1}\left(\frac{1}{2}\right)$ $+2\sin^{-1}\left(\frac{1}{2}\right)$ Watch Free Video Solution on Doubtnut
13	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 13** If $s \in^{-1} x = y$, then (A) $0 \leq y \leq \pi$ (B) $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$ (C) $0 < y < \pi$ (d) $-\frac{\pi}{2} < y < \frac{\pi}{2}$

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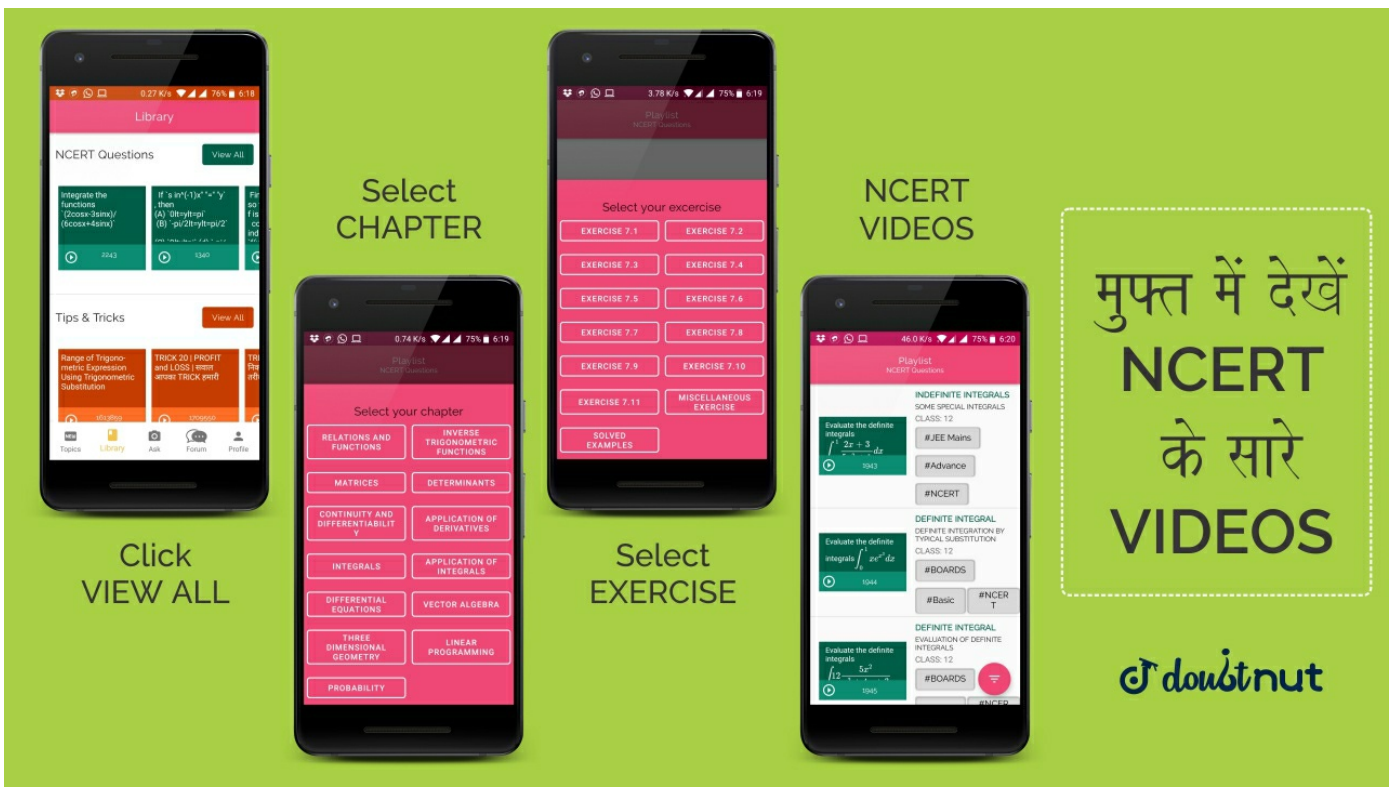
14	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.1 - Q 14** $\tan^{-1}\sqrt{3}$ $-\sec^{-1}(-2)$ is equal to (a) π (B) $-\frac{\pi}{3}$ (C) $\frac{\pi}{3}$ (D) $\frac{2\pi}{3}$ Watch Free Video Solution on Doubtnut
15	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 1** Prove that: $3\sin^{-1}x$ $=\sin^{-1}(3x-4x^3)$, $x\in\left[-\frac{1}{2},\frac{1}{2}\right]$ Watch Free Video Solution on Doubtnut
16	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 2** Prove that: $3\cos^{-1}x$ $=\cos^{-1}(4x^3-3x)$, $x\in\left[\frac{1}{2},1\right]$ Watch Free Video Solution on Doubtnut
17	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 3** Prove that: $\frac{\tan^{-1}2}{11}+\frac{\tan^{-1}7}{24}$ $=\frac{\tan^{-1}1}{2}$ Watch Free Video Solution on Doubtnut

18	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 4** Prove that: $2\frac{\tan^{-1}1}{2} + \frac{\tan^{-1}1}{7} = \frac{\tan^{-1}(31)}{17}$ Watch Free Video Solution on Doubtnut
19	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 5** Write the following function in the simplest form: $\tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right),$ $x \neq 0$ Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 6

20	Write the following function in the simplest form: $\tan^{-1}\left(\frac{1}{\sqrt{x^2-1}}\right)$, $|x|>1$ Watch Free Video Solution on Doubtnut
21	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 7** Write the following function in the simplest form: $\tan^{-1}\sqrt{\frac{1-\cos x}{1+\cos x}}$ Watch Free Video Solution on Doubtnut
22	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 8** Write the following function in the simplest form: `tan^(-1)((cosx-sinx)/(cosx+sinx)), x Watch Free Video Solution on Doubtnut
23	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 9** Write the following function in the simplest form: $\frac{\tan^{-1}x}{\sqrt{a^2-x^2}}, |x|<a$ Watch Free Video Solution on Doubtnut
	
	NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 10 Write the following function in the simplest form:

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24	$\tan^{-1}\left(\frac{3a^2x - x^3}{a^3 - 3ax^2}\right)$, $a > 0; \frac{-a}{\sqrt{3}} \leq x \leq \frac{a}{\sqrt{3}}$ Watch Free Video Solution on Doubtnut
25	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 11** Find the value of: $\tan^{-1}\left[2\cos\left(2\frac{\sin^{-1}1}{2}\right)\right]$ Watch Free Video Solution on Doubtnut
26	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 12** Find the value of: $\cot\left(\tan^{-1}a + \cot^{-1}a\right)$ Watch Free Video Solution on Doubtnut
27	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 13** Find the value of: $\tan\left(\frac{1}{2}\left[\frac{\sin^{-1}(2x)}{1+x^2} + \frac{\cos^{-1}(1-y^2)}{1+y^2}\right]\right)$, $\lvert x\rvert < 1, y > 0$ and $xy < 1$ Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 14 If

28	$\sin\left(\frac{\sin^{-1}1}{5}+\cos^{-1}x\right)=1$, then find the value of x. Watch Free Video Solution on Doubtnut
29	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 15** If $\frac{\tan^{-1}(x-1)}{x-2}+\frac{\tan^{-1}(x+1)}{x+2}=\frac{\pi}{4}$, then find the value of x. Watch Free Video Solution on Doubtnut
	
30	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 16** Find the value of $\sin^{-1}\left(\frac{\sin(2\pi)}{3}\right)$ Watch Free Video Solution on Doubtnut
31	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 17** Find the value of $\tan^{-1}\left(\frac{\tan(3\pi)}{4}\right)$

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32	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 18** Find the value of $\tan\left(\sin^{-1}\left(\frac{3}{5}\right)\right.$ $\left.+\cot^{-1}\left(\frac{3}{2}\right)\right)$ Watch Free Video Solution on Doubtnut
33	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 19** $\cos^{-1}\left(\frac{\cos(7\pi)}{6}\right)$ is equal to (a) $\frac{7\pi}{6}$ (B) $\frac{5\pi}{6}$ (C) $\frac{\pi}{3}$ (D) $\frac{\pi}{6}$ Watch Free Video Solution on Doubtnut
34	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 20** $\sin\left(\frac{\pi}{3}\right.$ $\left.-\sin^{-1}\left(-\frac{1}{2}\right)\right)$ is equal to (A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{1}{4}$ (D) 1 Watch Free Video Solution on Doubtnut
35	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - EXERCISE 2.2 - Q 21** $\tan^{-1}\sqrt{3}$ $-\cot^{-1}(-\sqrt{3})$ is equal to (A) π (B) $-\frac{\pi}{2}$ (C) 0 (D) $2\sqrt{3}$ Watch Free Video Solution on Doubtnut

36	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 1** Find the value of the following: $\cos^{-1}\left(\frac{\cos(13\pi)}{6}\right)$ Watch Free Video Solution on Doubtnut
37	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 2** Find the value of the following: $\tan^{-1}\left(\frac{\tan(7\pi)}{6}\right)$ Watch Free Video Solution on Doubtnut
38	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 3** Prove that: $2\frac{\sin^{-1}3}{5} = \frac{\tan^{-1}(24)}{7}$ Watch Free Video Solution on Doubtnut
39	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 4** Prove that: $\frac{\sin^{-1}8}{17} + \frac{\sin^{-1}3}{5} = \frac{\tan^{-1}(77)}{36}$

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40	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 5** Prove that: $\frac{\cos^{-1}4}{5}+\frac{\cos^{-1}(12)}{13}=\frac{\cos^{-1}(33)}{65}$ Watch Free Video Solution on Doubtnut
41	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 6** Prove that: $\frac{\cos^{-1}(12)}{13}+\frac{\sin^{-1}3}{5}=\frac{\sin^{-1}(56)}{65}$ Watch Free Video Solution on Doubtnut
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	NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 7 Prove that:

42	$\frac{\tan^{-1}(63)}{16} = \frac{\sin^{-1}5}{13} + \frac{\cos^{-1}3}{5}$ Watch Free Video Solution on Doubtnut
43	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 8** Prove that: $\tan^{-1}\left(\frac{1}{5}\right) + \tan^{-1}\left(\frac{1}{7}\right) + \tan^{-1}\left(\frac{1}{3}\right) + \tan^{-1}\left(\frac{1}{8}\right) = \frac{\pi}{4}$ Watch Free Video Solution on Doubtnut
44	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 9** Prove that: $\tan^{-1}\sqrt{x} = \frac{1}{2}\cos^{-1}\left(\frac{1-x}{1+x}\right),$ $x \in [0,1]$ Watch Free Video Solution on Doubtnut
45	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 10** 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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NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 11

Prove that

$$\tan^{-1}\left(\frac{\sqrt{1+x}-\sqrt{1-\sin x}}{\sqrt{1+x}-\sqrt{1-\sin x}}\right)$$

$$=\frac{\pi}{4}-\frac{1}{2}\cos^{-1},$$

$$-\frac{1}{\sqrt{2}}\leq x\leq 1$$

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NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 12

Prove that:

$$\frac{9\pi}{8}-\frac{9}{4}\frac{\sin^{-1}1}{3}$$

$$=\frac{9}{4}\frac{\sin^{-1}\left(2\sqrt{2}\right)}{3}$$

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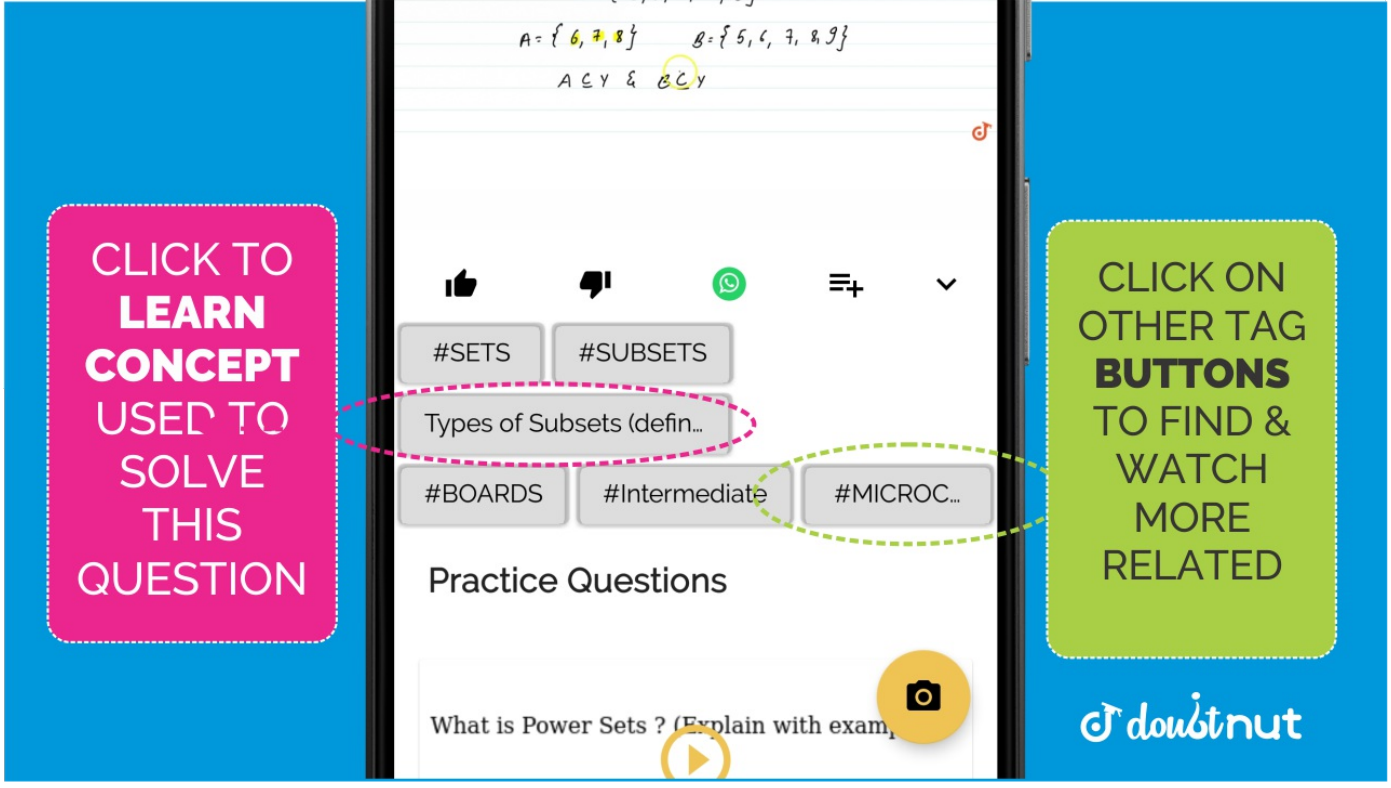

48	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 13** Solve the equations. $2\tan^{-1}(\cos x)$ $= \tan^{-1}(2\cos ecx)$ Watch Free Video Solution on Doubtnut
49	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 14** Solve the equations. $\frac{\tan^{-1}(1-x)}{1+x}$ $= \frac{1}{2}\tan^{-1}x,$ $(x > 0)$ Watch Free Video Solution on Doubtnut
50	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 15** Solve the equations. $\sin\left(\tan^{-1}x\right), \lvert x\rvert$ < 1 (a) $\frac{x}{\sqrt{1-x^2}}$ (B) $\frac{1}{\sqrt{1-x^2}}$ (C) $\frac{1}{\sqrt{1+x^2}}$ (D) $\frac{x}{\sqrt{1+x^2}}$ Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS -

51	**MISCELLANEOUS EXERCISE - Q 16** $\sin^{-1}(1-x) - 2\sin^{-1}x = \frac{\pi}{2}$, then x is equal to (A) $0, \frac{1}{2}$ (B) $1, \frac{1}{2}$ (C) 0 (D) $\frac{1}{2}$ Watch Free Video Solution on Doubtnut
52	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - MISCELLANEOUS EXERCISE - Q 17** $\tan^{-1}\left(\frac{x}{y}\right) - \frac{\tan^{-1}(x-y)}{x+y}$ is equal to (A) $\frac{\pi}{2}$ (B) $\frac{\pi}{3}$ (C) $\frac{\pi}{4}$ (D) $\frac{-3\pi}{4}$ Watch Free Video Solution on Doubtnut
53	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 1** Find the principal value of $\sin^{-1}\left(\frac{1}{\sqrt{2}}\right)$ Watch Free Video Solution on Doubtnut
54	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 2** Find the principal value of $\cot^{-1}\left(\frac{-1}{\sqrt{3}}\right)$.

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55	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 3** Show that (i) $\sin^{-1}\left(2x\sqrt{1-x^2}\right)$ $= 2\sin^{-1}x, -\frac{1}{\sqrt{2}}$ $\leq x \leq \frac{1}{\sqrt{2}}$ (ii) $\sin^{-1}\left(2x\sqrt{1-x^2}\right)$ $= 2\cos^{-1}x, \frac{1}{\sqrt{2}}$ $\leq x \leq 1$ Watch Free Video Solution on Doubtnut
56	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 4** Show that $\frac{\tan^{-1}1}{2} + \frac{\tan^{-1}2}{11}$ $= \frac{\tan^{-1}3}{4}$ Watch Free Video Solution on Doubtnut
57	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 5** Express `tan^(-1)((cosx)/(1-sinx)),-pi/2 Watch Free Video Solution on Doubtnut
58	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 6** Write $\cot^{-1}\left(\frac{1}{\sqrt{x^2-1}}\right),$ $\lvert x\rvert > 1$ in the simplest form.

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59	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 7** Prove that $\tan^{-1}x + \frac{\tan^{-1}(2x)}{1-x^2} = \tan^{-1}\left(\frac{3x-x^3}{1-3x^2}\right), \quad |x| < \frac{1}{\sqrt{3}}$ Watch Free Video Solution on Doubtnut

60	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 8** Find the value of $\cos\left(\sec^{-1}x + \operatorname{cosec}^{-1}x\right), \quad |x| \geq 1$ Watch Free Video Solution on Doubtnut
61	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 9** Find the value of $\sin^{-1}\left(\frac{\sin(3\pi)}{5}\right)$. Watch Free Video Solution on Doubtnut

62	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 10** Show that $\frac{\sin^{-1}3}{5} - \frac{\sin^{-1}8}{17} = \frac{\cos^{-1}(84)}{85}$. Watch Free Video Solution on Doubtnut
63	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 11** Show that $\frac{\sin^{-1}(12)}{13} + \frac{\cos^{-1}4}{5} + \frac{\tan^{-1}(63)}{16} = \pi$. Watch Free Video Solution on Doubtnut
64	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 12** Simplify $\tan^{-1}\left[\frac{a\cos x - b\sin x}{b\cos x + a\sin x}\right]$, if $\frac{a}{b}\tan x > -1$. Watch Free Video Solution on Doubtnut
65	**NCERT - CLASS 12 - CHAPTER 2 INVERSE TRIGONOMETRIC FUNCTIONS - SOLVED EXAMPLES - Q 13** Solve $\tan^{-1}2x + \tan^{-1}3x = \frac{\pi}{4}$. Watch Free Video Solution on Doubtnut
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