



DRONESHWAR DEFENCE ACADEMY

MATH -TEST

Time : 2 hrs

Q1. Show that

(i) $\sin^{-1}(2x\sqrt{1-x^2}) = 2 \sin^{-1}x, -\frac{1}{\sqrt{2}} \leq x \leq \frac{1}{\sqrt{2}}$

Q2. Write $\cot^{-1}\left(\frac{1}{\sqrt{x^2-1}}\right), x > 1$ in the simplest form.

Q3. Find the values of each of the following:

(i) $\tan^{-1}\left[2 \cos\left(2 \sin^{-1}\frac{1}{2}\right)\right]$

Q4. Find the value of $\sin^{-1}\left(\sin\frac{3\pi}{5}\right)$

Q5. Find the value of the following:

(a) $\cos^{-1}\left(\cos\frac{13\pi}{6}\right)$

(b) $\tan^{-1}\left(\tan\frac{7\pi}{6}\right)$

Q6. Find the principal value of $\sin^{-1}\left(\frac{1}{\sqrt{2}}\right)$

Q7. Find the principal value of $\cot^{-1}\left(\frac{-1}{\sqrt{3}}\right)$

Q8. Find the principal values of the following:

1. $\sin^{-1}\left(-\frac{1}{2}\right)$

2. $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$

3. $\operatorname{cosec}^{-1}(2)$



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Q9. Find the values of the following:

1. $\cos^{-1} \frac{1}{2} + 2 \sin^{-1} \frac{1}{2}$

Q10. Express $\tan^{-1} \frac{\cos x}{1 - \sin x}, \frac{-3\pi}{2} < x < \frac{\pi}{2}$ in the simplest form.

