ASSIGNMENT CLASS XI TRIGONOMETRY

1. The larger hand of a big clock is 35 cm long. How many cm does its tip move in 9 minutes?

2. In a rigt angled triangle , the difference between two acute angles is $\frac{\pi}{18}$. Express the angles in degrees.

3. The angles of a triangle are in A.P. and the number of degrees in the least to the number of radians in the greatest is $60:\pi$. Find the angles in radians.

4. If $\cot\theta=-\frac{12}{5}$ and θ lies in the second quadrant, find the values of other five trigonometric functions.

5. If $\cot\alpha=\frac{1}{2},\alpha\in\left(\pi,\frac{3\pi}{2}\right)$ and $\sec\beta=\frac{-5}{3},\beta\in\left(\frac{\pi}{2},\pi\right)$, find the value of $\tan(\alpha+\beta)$.

6. If $\cos x=\frac{4}{5},\cos y=\frac{12}{13}$; $\frac{3\pi}{2}<x<2\pi$ and $\frac{3\pi}{2}<y<2\pi$, find the values of $\cos(x+y)$ and $\sin(x-y)$.

7. Prove that (i) $\cos^2\frac{\pi}{8}+\cos^2\frac{3\pi}{8}+\cos^2\frac{5\pi}{8}+\cos^2\frac{7\pi}{8}=2$ (ii) $\sin^2\frac{\pi}{4}+\sin^2\frac{3\pi}{4}+\sin^2\frac{5\pi}{4}+\sin^2\frac{7\pi}{4}=2$

8. If $\tan\alpha=\frac{m}{m+1}$ and $\tan\beta=\frac{1}{2m+1}$, show that $\alpha+\beta=\frac{\pi}{4}$.

9. Prove that: (i) $\cos 20^0\cos 40^0\cos 80^0=\frac{1}{8}$ (ii) $\sin 10^0\sin 50^0\sin 60^0\sin 70^0=\frac{\sqrt{3}}{16}$.

10. Prove that: (i) $\cos\theta\cos\left(\frac{\pi}{3}-\theta\right)\cos\left(\frac{\pi}{3}+\theta\right)=\frac{1}{4}\cos 3\theta$ (ii) $\sin\theta\sin\left(\theta+\frac{\pi}{3}\right)\sin\left(\theta+\frac{2\pi}{3}\right)=\frac{1}{4}\sin 3\theta$

11. Prove that: (i) $\frac{\sin 8\theta\cos\theta-\sin 6\theta\cos 3\theta}{\cos 2\theta\cos\theta-\sin 3\theta\sin 4\theta}=\tan 2\theta$ (ii) $\frac{\sin(A+B)-2\sin A+\sin(A-B)}{\cos(A+B)-2\cos A+\cos(A-B)}=\tan A$

12. Draw the graph of: $(i)\,3\sin x$ $(ii)\,\sin 2x$ $(iii)-\cos x$ $(iv)\,3\cos 2x$

13. Solve the following trigonometric equations:

$(i)\sin 3x+\cos 2x=0$ $(ii)\,3\tan x+\cot x=5\operatorname{cosec} x$ $(iii)\,2\tan x-\cot x+1=0$

$(iv)\sin 2x+\sin 4x+\sin 6x=0$ $(v)\cos 3x+\cos x=\cos 4x+\cos 2x$

ANSWERS

1. 33 cm 2. $50^0,40^0$ 3. $\frac{\pi}{6},\frac{\pi}{3},\frac{\pi}{2}$ 4. $\operatorname{cosec}\theta=\frac{13}{5},\tan\theta=-\frac{5}{12},\sin\theta=\frac{5}{13},\cos\theta=-\frac{12}{13},\sec\theta=-\frac{13}{12}$

5. $\frac{2}{11}$ 6. $\frac{33}{65},-\frac{16}{65}$ 13. $(i)\,x=2n\pi-\frac{\pi}{2}$ or $x=\frac{2n\pi}{5}-\frac{\pi}{10}$ $(ii)\,\theta=2n\pi\pm\frac{\pi}{3}$

$(iii)\,x=n\pi+\frac{3\pi}{4}$ or $x=m\pi+\alpha,\tan\alpha=\frac{1}{2}$ $(v)\,x=2n\pi,\frac{2m\pi}{5}$ or $(2p+1)\frac{\pi}{2}$