

SWOT INSTITUTE

TRIGONOMETRY

XI-TEST

Time : 1 hr.

1. Prove that

$$3 \sin \frac{\pi}{6} \sec \frac{\pi}{3} - 4 \sin \frac{5\pi}{6} \cot \frac{\pi}{4} = 1$$

2. Show that : $\tan 3x \tan 2x \tan x = \tan 3x - \tan 2x - \tan x$.

3. Prove that

$$\frac{\sin(x+y)}{\sin(x-y)} = \frac{\tan x + \tan y}{\tan x - \tan y}$$

4. Prove that : $\frac{\sin 5x - 2 \sin 3x + \sin x}{\cos 5x - \cos x} = \tan x$.

5. Prove that : $\tan 4x = \frac{4 \tan x(1 - \tan^2 x)}{1 - 6 \tan^2 x + \tan^4 x}$

6. Solve $2 \cos^2 x + 3 \sin x = 0$.

7. The minute hand of a watch is 1.5 cm long. How far does its tips move in 40 minutes ?
(Use $\pi = 3.14$)

8. Prove that : $\frac{\cos 7x + \cos 5x}{\sin 7x - \sin 5x} = \cot x$.

9. A wheel makes 360 revolutions in one minute. Through how many radians does it turn in one second ?

10. Prove that : $\cos^2 2x - \cos^2 6x = \sin 4x \sin 8x$.

11. Prove that $\cos^2 x + \cos^2 \left(x + \frac{\pi}{3}\right) + \cos^2 \left(x - \frac{\pi}{3}\right) = \frac{3}{2}$

12. Solve $\sin 2x - \sin 4x + \sin 6x = 0$.

13. If $\tan x = \frac{3}{4}$, $\pi < x < \frac{3\pi}{2}$, find the value of $\sin \frac{x}{2}$, $\cos \frac{x}{2}$ and $\tan \frac{x}{2}$.