ACHIEVERS FOUNDATION
TRIGONOMETRY

1) Sin A + cos A = $\sqrt{2}$ then evaluate . tan A + cot A

2) Without using tables, evaluate :

   (i) $\dfrac{\sin 53^0}{\cos 37^0}$ (ii) $\dfrac{\cos 49^0}{\sin 41^0}$ (iii) $\dfrac{\tan 66^0}{\cot 24^0}$

3) Without using tables, show that (cos 35^0 cos 55^0 – sin 35^0 sin 55^0) = 0.

4) Prove $(\cos ecA - \sin A)(\sec A - \cos A) = \dfrac{1}{\tan A + \cot A}$

5) Prove that :

a)   (coses A – sin A) (sec A – cos A) (tan A + cot A) = 1.

b) If $\sec\theta = x + \dfrac{1}{4x}$, then prove that $\sec\theta + \tan\theta = 2x$ or $\dfrac{1}{2x}$.

c)   (1 + tan² A) + $\left(1 + \dfrac{1}{\tan^2 A}\right) = \dfrac{1}{\sin^2 A - \sin^4 A}$

d) $\sqrt{\dfrac{\sec\theta - 1}{\sec\theta + 1}} + \sqrt{\dfrac{\sec\theta + 1}{\sec\theta + 1}}$ = 2 cosec θ

e)   (Sin³ θ + cos ³ θ) / (sin θ + cos θ) + sin θ cos θ = 1

f)   tan ² θ + cot² θ + 2 = sec ² θ cosec ² θ

6.   sin 30^0 + cos 60^0 equals :

   (A) $\dfrac{1 + \sqrt{3}}{2}$ (B) $\sqrt{3}$ (C) 1   (D) None of these

7.   The value of 2 tan² 60^0 – 4 cos² 45^0 – 3 sec² 30^0 is :
   (A) 0   (B) 1   (C) 12   (D) 8

8.   The value of $\dfrac{3}{4}$ tan² 30^0 – 3 sin² 60^0 + 3 cosec² 45^0 is

   (A) 1   (B) 8   (C) 0   (D) 12

9.   7 sin² θ + 3 cos² θ = 4 then :

   (A) $\tan\theta = \dfrac{1}{\sqrt{2}}$ (B) $\tan\theta = \dfrac{1}{2}$ (C) $\tan\theta = \dfrac{1}{3}$ (D) $\tan\theta = \dfrac{1}{\sqrt{3}}$

10.   The solution of the trigonometric equation $\dfrac{\cos^2\theta}{\cot^2\theta - \cos^2\theta} = 3, 0^0 < \theta < 90^0$:

   (A) $\theta = 0^0$ (B) θ = 30^0 (C) θ = 60^0 (D) θ = 90^0

ACHIEVERS FOUNDATION

11. If $\cot\theta + \cos\theta$ = p and $\cot\theta$ = q, then the value of $p^2 - q^2$ is :

(A) $2\sqrt{pq}$ (B) $4\sqrt{pq}$ (C) 2 pq   (D) 4 pq

12. The value of $\sin^2 15^0 + \sin^2 30^0 + \sin^2 45^0 + \sin^2 60^0 + \sin^2 75^0$ is :

(A) 1   (B) $\dfrac{3}{2}$ (C) $\dfrac{5}{2}$ (D) 3

13. The value of $\dfrac{\sin 29^0}{\cos 61^0} - \dfrac{\sin 61^0}{\cos 29^0}$ is :

(A) Zero   (B) 1   (C) $\dfrac{61}{29}$ (D) $\dfrac{29}{61}$

14. The values of x and y which make the following solutions true are: $\cos x^0 = \sin 52^0$ and $\cos y^0 = \sin (y^0 + 10)$

(A) x = 52^0, y = 30^0 (B) x = 38^0, y = 40^0 (C) x = 48^0, y = 52^0 (D) x = 40^0, y = 50^0

15. If $\alpha + \beta = 90^0$ and $\alpha = 2\beta$ then $\cos^2\alpha + \sin^2\beta$ equal :

(A) 1   (B) Zero   (C) $\dfrac{1}{2}$ (D) 2

16. In a $\triangle$ ABC, right angled at B, if tan A = $\dfrac{1}{\sqrt{3}}$, find the value of -

     (i)   sinA cosC + cosA sinC

     (ii)   cosA cosC − sinA sinC.

17. If sinA = $\dfrac{1}{2}$, verify that 2 sinA cosA = $\dfrac{2\tan A}{1 + \tan^2 A}$

18. In $\triangle$ PQR, right angled at Q, PR + QR = 25 cm and PQ = 5 cm. Find the value of sinP, cosP and tanP.

19. In $\triangle$ ABC, right angled at C, if AC = 4 cm and AB = 8 cm. Find $\angle$ A and $\angle$ B.

20. Find the value of θ in each of the following :

(i) 2 sin 2θ = $\sqrt{3}$ (ii) 2 cos 3θ = 1   (iii) $\sqrt{3}$ tan 2θ − 3 = 0