



INDIAN SCHOOL AL WADI AL KABIR

Department: Mathematics

Class X

Worksheet – Introduction to Trigonometry

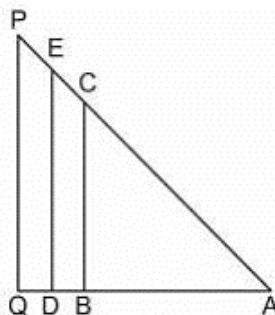
10 - 08 -2023

Questions of 2 marks each

Q.1. If $\cos \theta + \sin \theta = \sqrt{2} \cos \theta$, show that $\cos \theta - \sin \theta = \sqrt{2} \sin \theta$

Q.2. If $\cos (A - B) = \frac{\sqrt{3}}{2}$ and $\sin (A + B) = \frac{\sqrt{3}}{2}$, find A and B where (A + B) and (A - B) are acute angles.

Q.3. In the given figure, ABC, ADE and AQP are three right triangles. The value of $\sin A$ is the greatest for ΔAQP . Do you agree? Justify your answer. **(CFQ)**



Q.4. Evaluate: $4 \cot^2 45^\circ - \sec^2 60^\circ + \sin^2 60^\circ + \cos^2 90^\circ$.

Q.5. If $\sqrt{3} \sin \theta - \cos \theta = 0$ and $0^\circ < \theta < 90^\circ$, find the value of θ .

Questions of 3 marks each

Q.6. In ΔPQR , if $PQ : QR : PR = 8 : 15 : 17$, then evaluate,

(i) $\cos P \cdot \cos R - \sin P \cdot \sin R$

(ii) $\frac{\tan P - \tan R}{1 + \tan P \cdot \tan R}$

Q.7. Prove that: $\frac{\cos^2 \theta}{1 - \tan \theta} + \frac{\sin^3 \theta}{\sin \theta - \cos \theta} = 1 + \sin \theta \cos \theta$ **(CFQ)**

Q.8.	If $5 \tan \theta = 3$, then find the value of $\frac{(5\sin\theta - 3\cos\theta)}{(4\sin\theta + 3\cos\theta)}$
Q.9.	<p>In the fig, $5 \sin P = 4$. What is the length of PR? Draw the diagram and show your steps. (CFQ)</p> <div style="text-align: center;"> </div> <p style="text-align: right;">(Note: The figure is not to scale)</p>
Q.10.	Prove: $(\operatorname{cosec} \theta + \cot \theta)^2 = \frac{\sec \theta + 1}{\sec \theta - 1}$

Questions of 5 marks each

Q.11.	Prove that: $\frac{\tan^3 \theta}{1 + \tan^2 \theta} + \frac{\cot^3 \theta}{1 + \cot^2 \theta} = \sec \theta \cdot \operatorname{cosec} \theta - 2 \sin \theta \cdot \cos \theta$
Q.12.	If $\tan \theta + \sin \theta = m$, $\tan \theta - \sin \theta = n$ then show that $m^2 - n^2 = 4\sqrt{mn}$ (CFQ)
Q.13.	Prove that: $2(\cos^6 \theta + \sin^6 \theta) - 3(\sin^4 \theta + \cos^4 \theta) + 1 = 0$
Q.14.	If $a \sin \theta + b \cos \theta = c$, then prove that $a \cos \theta - b \sin \theta = \sqrt{a^2 + b^2 - c^2}$
Q.15.	If $x \sin^3 \theta + y \cos^3 \theta = \sin \theta \cos \theta$ and $x \sin \theta = y \cos \theta$, prove that $x^2 + y^2 = 1$ (CFQ)

ANSWERS

Q.2	45°, 15°	Q.4	$\frac{3}{4}$	Q.5	30°	Q.6	(i) 0 (ii) $\frac{161}{240}$
Q.8	0	Q.9	18 units				