INDIAN SCHOOL DARSAIT
DEPARTMENT OF MATHEMATICS

Subject : MATHEMATICS | Topic : INTRODUCTION TO TRIGONOMETRY | Date of Worksheet : 21.10.2019
Worksheet no: 8
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Name of the Student _____ Class &Division:_X_____ Roll Number : ___

S.No. **Section A-[Basic skills]**

1. $\frac{2}{25} - \frac{1}{10} =$

2. $2300 \times 45.5 \times \frac{1}{15} =$

3. $(36 \div 6) \times 31.4 =$

4. Simplify : $\frac{2}{x} - \frac{3}{y} = \frac{1}{x}$

5. Simplify : $\frac{x^2 - 3x - 4xy}{3x}$

Sl.N0. **Section B -[Chapter based questions]** Marks

1. Evaluate $\frac{2 \tan 30^0}{1 - \tan^2 30^0}$ 1

2. If $\sin 3\theta = \cos(\theta - 2^0)$, where 3θ and $(\theta - 2^0)$ are both acute angles, then find the value of θ. 1

3. If $\sqrt{3}\tan 2\theta - 3 = 0$, then find the value of θ. 2

4. If $\sin(A - B) = \frac{1}{2}$ and $\sin(A+B) = \frac{\sqrt{3}}{2}$, $0^0 < A+B < 90^0$ and $A > B$, then find A andB. 2

5. In ΔABC, right angled at A, if $\tan C = \sqrt{3}$, find the value of $\sin B \cos C + \cos B \sin C$ 3

6. Prove that $\frac{1 + \sec A}{\sec A} = \frac{\sin^2 A}{1 - \cos A}$ 4

7. Evaluate $\frac{\sec\theta \operatorname{Cosec}(90^0 - \theta) - \tan\theta \cot(90^0 - \theta) + \sin^2 55^0 + \sin^2 35^0}{\tan 10^0 \tan 20^0 \tan 60^0 \tan 70^0 \tan 80^0}$ 4

8. If $\sec\theta + \tan\theta = m$, show that $\frac{m^2 - 1}{m^2 + 1} = \sin\theta$ 4

9. Prove the following identities
   i) $\frac{1-\sin\theta}{1+\sin\theta} = (\sec\theta - \tan\theta)^2$
   ii) $(\operatorname{cosec}\theta - \sin\theta)(\sec\theta - \cos\theta)(\tan\theta + \cot\theta) = 1$ 4

10. Evaluate $4(\sin^4 30^0 + \cos^4 60^0) - \frac{2}{3}(\sin^2 60^0 - \cos^2 45^0) + \frac{1}{2}\tan^2 60^0$ 4

11. If $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$, show that $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$ 4

12. If A, B and C are the interior angles of the triangle ABC, prove that : 3
$\tan\frac{B+C}{2} = \cot\frac{A}{2}$

13. If $x = a\sin\theta$ and $y = b\tan\theta$, then prove that $a^2/x^2 - b^2/y^2 = 1$ 4

SECTION C [HOT QUESTIONS]

1. If $\frac{\cos\alpha}{\cos\beta} = m$ and $\frac{\cos\alpha}{\sin\beta} = n$ show that $(m^2 + n^2)\cos^2\beta = n^2$ 4

2. Evaluate : $\cos(40^0 - \theta) - \sin(50^0 + \theta) + \frac{\cos^2 40^0 + \cos^2 50^0}{\sin^2 40^0 + \sin^2 50^0}$ 4

3. If $\sec\theta = x + \frac{1}{4x}$, prove that : $\sec\theta + \tan\theta = 2x$ or $\frac{1}{2x}$ 4

4. Prove that $\sec^4\theta - \sec^2\theta = \tan^4\theta - \tan^2\theta$ 4

5. Prove that $2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta) + 1 = 0$ 4

6. Prove that $\sin^8\theta - \cos^8\theta = (\sin^2\theta + \cos^2\theta)(1 - 2\sin^2\theta\cos^2\theta)$ 4