



INDIAN SCHOOL DARSAIT
DEPARTMENT OF MATHEMATICS
WORKSHEET # 13



Subject : MATHEMATICS	Topic : INTRODUCTION TO TRIGONOMETRY	Date of Worksheet : 01/10/2017
Resource Person: Mrs. Indu .P		Date of submission : 10/10/2017
Name of the Student _____	Class & Division: _____	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.No. Section B -[Chapter based questions] Marks

1. Evaluate $\frac{2 \tan 30^0}{1 - \tan^2 30^0}$ 1
2. If $\sin 3 = \cos (- 2^0)$, where 3 and $(- 2^0)$ are both acute angles, then find the value of . 1
3. If $\sqrt{3} \tan 2 - 3 = 0$, then find the value of . 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 and B. 2
5. In $\triangle ABC$, 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 $\frac{\sec 10^0 \operatorname{cosec} 20^0 - \tan 60^0 \cot 70^0 + \sin^2 55^0 + \sin^2 35^0}{\tan 10^0 \tan 20^0 \tan 60^0 \tan 70^0 \tan 80^0}$ 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 4
 - i) $\frac{1 - \sin \theta}{1 + \sin \theta} = (\sec \theta - \tan \theta)^2$
 - ii) $(\operatorname{cosec} \theta - \sin \theta)(\sec \theta - \cos \theta)(\tan \theta + \cot \theta) = 1$



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10. Evaluate $4(\sin^4 30^\circ + \cos^4 60^\circ) - \frac{2}{3} (\sin^2 60^\circ - \cos^2 45^\circ) + \frac{1}{2} \tan^2 60^\circ$ 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 $\frac{\cos \Gamma}{\cos S} = m$ and $\frac{\cos \Gamma}{\sin S} = n$ show that $(m^2 + n^2)\cos^2 S = n^2$ 4
2. Evaluate : $\cos(40^\circ - \theta) - \sin(50^\circ + \theta) + \frac{\cos^2 40^\circ + \cos^2 50^\circ}{\sin^2 40^\circ + \sin^2 50^\circ}$ 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
7. If $\cot \theta + \tan \theta = x$ and $\sec \theta - \cos \theta = y$, prove that $(x^2 y)^{2/3} - (xy^2)^{2/3} = 1$ 3
8. If $x \sin^3 \theta + y \cos^3 \theta = \sin \theta \cos \theta$ and $x \sin \theta = y \cos \theta$, prove that $x^2 + y^2 = 1$ 4
9. If $\tan \theta + \sin \theta = m$ and $\tan \theta - \sin \theta = n$, show that $m^2 - n^2 = 4\sqrt{mn}$ 4
10. If $\tan A = n \tan B$ and $\sin A = m \sin B$, prove that $\cos^2 A = \frac{m^2 - 1}{n^2 - 1}$ 4
11. If $x \cos \theta - y \sin \theta = a$, $x \sin \theta + y \cos \theta = b$, prove that $x^2 + y^2 = a^2 + b^2$. 3
12. If $\tan \theta = \frac{5}{6}$ and $\theta + \phi = 90^\circ$, find the value of $\cot \phi$ 2
13. If $2x = \sec \theta$ and $2/x = \tan \theta$, then find the value of $2 [x^2 - 1/x^2]$ 3