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SERIES - 1**IMP SERIES Introduced
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“CGBSE SUPPORT”****Important Questions
for Chhattisgarh
Board Exam ‘2021’**

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Class – 10th**Subject – Mathematics****“Trigonometric Ratios And Identities”****‘1’ Marks Questions**

1. Find the value of followings:

a. $\frac{\cos 80^\circ}{\sin 10^\circ}$

b. $\frac{\sin 37^\circ}{2 \cos 53^\circ}$

c. $\sin^2 35^\circ + \sin^2 55^\circ$

d. $\frac{\sin 31^\circ}{2 \cos 59^\circ}$

‘2’ Marks Question

1. Prove: $\frac{1}{\sec \theta - 1} - \frac{1}{\sec \theta + 1} = 2 \cot^2 \theta$

2. Prove: $\sec^2 \theta + \operatorname{cosec}^2 \theta = \sec^2 \theta \cdot \operatorname{cosec}^2 \theta$

3. Prove: If $x = a \operatorname{cosec} \theta$ and $y = b \cot \theta$ then prove that $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$.

4. Solve the following trigonometric equations where $0^\circ \leq \theta \leq 90^\circ$

$$2 \sin^2 \theta - \cos \theta = 1$$

5. Find the value of: $\left(\frac{5 \sin 35^\circ}{\cos 55^\circ}\right) + \left(\frac{\cos 55^\circ}{2 \sin 35^\circ}\right) - 2 \cos 60^\circ$.

6. If $\sin A = \cos B$ then prove that $A + B = 90^\circ$

7. If $\operatorname{cosec} 2A = \sec(A - 36^\circ)$, where $2A$ is an acute angle, then find the value of A .

8. Find the value of $\left(\frac{\sin 47^\circ}{\cos 43^\circ}\right)^2 + \left(\frac{\cos 43^\circ}{\sin 47^\circ}\right)^2 - 4 \cos^2 45^\circ$

9. Prove that –

$$\tan 7^\circ \tan 23^\circ \tan 60^\circ \tan 67^\circ \tan 83^\circ = \sqrt{3}$$

10. If $\cot 3A = \tan(A - 22^\circ)$ where $3A$ is an acute angle, then find the value of A .

11. Prove that $-\sin^4\theta - \cos^4\theta = \sin^2\theta - \cos^2\theta$

'6' Marks Questions

1. Prove: $\sqrt{\frac{1-\cos\theta}{1+\cos\theta}} = \operatorname{cosec}\theta - \cot\theta$

2. Prove: $\frac{1+\cos\theta}{1-\cos\theta} - \frac{1-\cos\theta}{1+\cos\theta} = 4 \cot\theta \operatorname{cosec}\theta$

3. Prove: $\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = 2 \operatorname{cosec}\theta$

4. If $\cos\theta - \sin\theta = \sqrt{2} \sin\theta$ then prove that $\cos\theta + \sin\theta = \sqrt{2} \cos\theta$

5. If $\tan\theta = n \tan \phi$ and $\sin\theta = m \sin \phi$ then prove that $\cos^2\theta = \frac{m^2-1}{n^2-1}$

6. If $x = r \sin A \cos C$, $y = r \sin A \sin C$ and $z = r \cos A$ then prove that $r^2 = x^2 + y^2 + z^2$

7. Solve: $\frac{\cos\theta}{1-\sin\theta} + \frac{\cos\theta}{1+\sin\theta} = 4$

8. Prove that: $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = \frac{1+\sin\theta}{\cos\theta}$

9. Prove that: $\frac{\cos A}{1-\tan A} + \frac{\sin A}{1-\cot A} = \sin A + \cos A$

10. If $\cos\theta + \sin\theta = \sqrt{2} \cos\theta$

11. If $x = a \cos\theta - b \sin\theta$ and $y = a \sin\theta + b \cos\theta$ then prove that $x^2 + y^2 = a^2 + b^2$.

12. If $\tan\theta + \sin\theta = m$ and $\tan\theta - \sin\theta = n$ then prove that $m^2 - n^2 = 4\sqrt{mn}$

13. If $\angle A$, $\angle B$ and $\angle C$ are the interior angle of ΔABC , then prove that $\sin\left(\frac{A+B}{2}\right) = \cos\left(\frac{C}{2}\right)$

$\left(\frac{C}{2}\right)$