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CBSE 10th Introduction Trigonometry

Unsolved Paper

Question 1:

In each of the following one of the six trigonometric ratios is given. Find the values of the other trigonometric ratios.

(i) $\sin A = \frac{2}{3}$

(ii) $\cos A = \frac{4}{5}$

(iii) $\tan \theta = 11$

(iv) $\sin \theta = \frac{11}{5}$

(v) $\tan \alpha = \frac{5}{12}$

(vi) $\sin \theta = \frac{\sqrt{3}}{2}$

(vii) $\cos \theta = \frac{7}{25}$

(viii) $\tan \theta = \frac{8}{15}$

(ix) $\cot \theta = \frac{12}{5}$

(x)

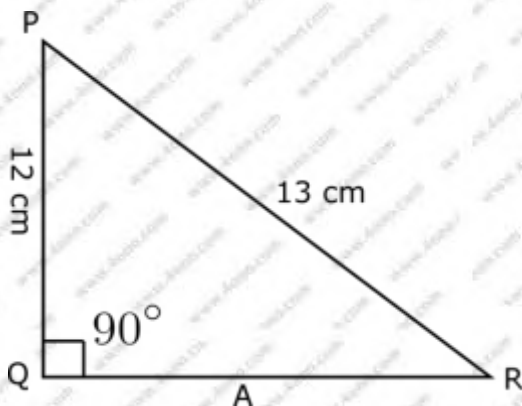
$$\sec \theta = \frac{13}{5}$$

(xi)

$$\operatorname{cosec} \theta = \sqrt{10}$$

(xii)

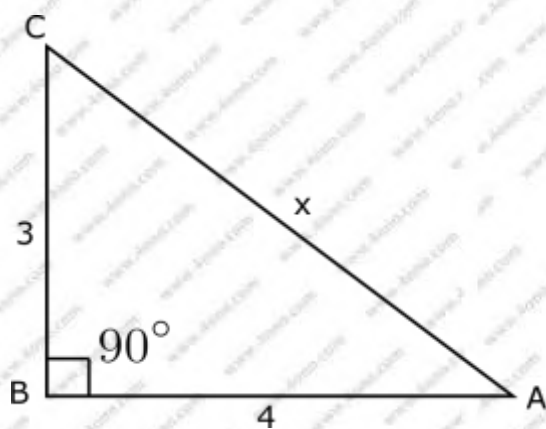
$$\cos \theta = 12/5$$

Question 2:**In Fig below, Find $\tan P$ and $\cot R$. Is $\tan P = \cot R$?****Question 3:****If $\cot \theta = \frac{7}{8}$, evaluate :**

$$(i) \quad \frac{(1+\sin \theta)(1-\sin \theta)}{(1+\cos \theta)(1-\cos \theta)}$$

$$(ii) \quad \cot^2 \theta$$

Question 4:**If $3 \cot A = 4$, Check whether $\frac{1-\tan^2 A}{1+\tan^2 A} = \cos^2 A - \sin^2 A$ or not.**



Question 5:

If $\tan \theta = \frac{a}{b}$, find the value of $\frac{\cos \theta + \sin \theta}{\cos \theta - \sin \theta}$

Question 6:

If $3 \tan \theta = 4$, find the value of $\frac{4 \cos \theta - \sin \theta}{2 \cos \theta + \sin \theta}$

Question 7:

If $3 \cot \theta = 2$, find the value of $= \frac{4 \sin \theta - 3 \cos \theta}{2 \sin \theta + 6 \cos \theta}$

Question 8:

If $\tan \theta = \frac{a}{b}$, prove that $\frac{a \sin \theta - b \cos \theta}{a \sin \theta + b \cos \theta} = \frac{a^2 - b^2}{a^2 + b^2}$

Question 9:

$$2 \sin^2 30^\circ - 3 \cos^2 45^\circ + \tan^2 60^\circ$$

Question 10:

$$\sin^2 30^\circ \cos^2 45^\circ + 4 \tan^2 30^\circ + \frac{1}{2} \sin^2 90^\circ - 2 \cos^2 90^\circ + \frac{1}{24} \cos^2 0^\circ$$

Question 11:

$$(\cos 0^\circ + \sin 45^\circ + \sin 30^\circ)(\sin 90^\circ - \cos 45^\circ + \cos 60^\circ)$$

Question 12:

$$\frac{\sin 30^\circ - \sin 90^\circ + 2 \cos 0^\circ}{\tan 30^\circ \tan 60^\circ}$$

Question 13:

$$\frac{4}{\cot^2 30^\circ} + \frac{1}{\sin^2 60^\circ} - \cos^2 45^\circ$$

Question 14:

$$\frac{\sin 30^\circ}{\sin 45^\circ} + \frac{\sin 45^\circ}{\sin 60^\circ} - \frac{\sin 60^\circ}{\sin 45^\circ} - \frac{\sin 30^\circ}{\sin 60^\circ}$$

Question 15:

$$\frac{\tan 45^\circ}{\operatorname{cosec} 30^\circ} + \frac{\sec 60^\circ}{\cot 45^\circ} - \frac{5 \sin 90^\circ}{2 \cos 0^\circ}$$

Question 16:

If $A = B = 60^\circ$. Verify

- (i) $\cos(A - B) = \cos A \cos B + \sin A \sin B$
- (ii) Substitute A & B in (i)
- (iii) $\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$

Question 16:

$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$

$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$

Question 17:**Evaluate the following**

1. $\frac{\sin 20^\circ}{\cos 70^\circ}$

2. $\frac{\cos 19^\circ}{\sin 71^\circ}$

3. $\frac{\sin 21^\circ}{\cos 69^\circ}$

4. $\frac{\tan 10^\circ}{\cot 80^\circ}$

5. $\frac{\sec 11^\circ}{\operatorname{cosec} 79^\circ}$

Question 18:**Prove that**

(i) $\tan 20^\circ \tan 35^\circ \tan 45^\circ \tan 55^\circ \tan 70^\circ = 1$

(ii) $\sin 48^\circ \sec 42^\circ + \operatorname{cosec} 42^\circ = 2$

(iii) $\frac{\sin 70^\circ}{\cos 20^\circ} + \frac{\operatorname{cosec} 20^\circ}{\sec 70^\circ} - 2\cos 70^\circ \operatorname{cosec} 20^\circ = 0$

(iv) $\frac{\cos 80^\circ}{\sin 10^\circ} + \cos 59^\circ \operatorname{cosec} 31^\circ = 2$

Question 19:**Prove the following trigonometric identities:**

1. $(1 - \cos^2 A) \operatorname{cosec}^2 A = 1$

2. $(1 + \cos^2 A) \sin^2 A = 1$

3. $\tan^2 \theta \cos^2 \theta = 1 - \cos^2 \theta$
4. $\operatorname{cosec} \theta \sqrt{1 - \cos^2 \theta} = 1$
5. $(\sec^2 \theta - 1)(\operatorname{cosec}^2 \theta - 1) = 1$
6. $\tan \theta \frac{1}{\tan \theta} = \sec \theta \operatorname{cosec} \theta$

Question 20:

$$\frac{\cos \theta}{1 + \sin \theta} = \frac{1 - \sin \theta}{\cos \theta}$$

Question 21:

$$\cos^2 A + \frac{1}{1 + \cot^2 A} = 1$$

Question 22:

$$\sin^2 A + \frac{1}{1 + \tan^2 A} = 1$$

Question 23:

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

Question 24:

$$\frac{1 - \sin \theta}{1 + \sin \theta} - (\sec \theta - \tan \theta)^2$$

Question 25:

$$\tan^2 \theta - \sin^2 \theta \tan^2 \theta \sin^2 \theta$$

Question: 26

$$\sin^2 A \cot^2 A + \cos^2 A \tan^2 A = 1$$

Question: 27

$$\cos \theta - \tan \theta = \frac{2\cos^2 \theta - 1}{\sin \theta \cos \theta}$$

Question: 28

$$\frac{\cos^2 \theta}{\sin \theta} - \operatorname{cosec} \theta + \sin \theta = \theta$$

Question: 29

$$\frac{1}{1 + \sin A} + \frac{1}{1 - \sin A} = 2 \sec^2 A$$

Question: 30

$$\frac{1 + \sin \theta}{\cos \theta} + \frac{\cos \theta}{1 + \sin \theta} = 2 \sec \theta$$

Question: 31

$$\frac{(1 + \sin \theta)^2 + (1 - \sin \theta)^2}{2\cos^2 \theta} = \frac{1 + \sin^2 \theta}{1 - \sin^2 \theta}$$

Question: 32

$$\frac{1 + \tan^2 \theta}{1 + \cot^2 \theta} - \left[\frac{1 - \tan \theta}{\cot \theta} \right]^2 - \tan^2 \theta$$

Question: 33

$$\frac{1 + \sec \theta}{\sec \theta} = \frac{\sin^2 \theta}{1 - \cos \theta}$$

Question: 34

$$\frac{\tan \theta}{1 - \cot \theta} = \frac{\cot \theta}{1 - \tan \theta} = 1 + \tan \theta + \cot \theta$$

Question:35

$$\sec^6 \theta = \tan^6 \theta + 3 \tan^2 \theta \sec^2 \theta + 1$$

Question: 36

$$\operatorname{cosec}^6 \theta = \cot^6 \theta + 3 \cot^2 \theta \operatorname{cosec}^2 \theta + 1$$

Question: 37

$$\frac{(1 + \tan^2 \theta) \cot \theta}{\operatorname{cosec}^2 \theta} = \tan \theta$$

Question: 38

$$\frac{1 + \cos A}{\sin^2 A} = \frac{1}{1 - \cos A}$$

Question 39

$$\frac{\sec A - \tan A}{\sec A + \tan A} = \frac{\cos^2 A}{(1 + \sin A)^2}$$

Question 40

$$\sqrt{\frac{1 + \sin A}{1 - \sin A}} = \sin A + \tan A$$

Question 41

$$(\sec A - \tan A)^2 = \frac{1 - \sin A}{1 + \sin A}$$

Question 42

$$\frac{1 + \cos A}{1 - \cos A} = (\cot A - \operatorname{cosec} A)^2$$

Question 43

$$\frac{\cos A}{1 - \tan A} + \frac{\sin A}{(1 - \cot A)} = \sin A + \cos A$$

Question 44

$$\tan^2 A + \cot^2 A = \sec^2 A \operatorname{cosec}^2 A - 2$$

Question 45

$$\frac{1 - \tan^2 A}{\cot^2 A - 1} = \tan^2 A$$

Question 46

$$\frac{\cos \theta}{\operatorname{cosec} \theta + 1} + \frac{\cos \theta}{\operatorname{cosec} \theta - 1} = 2 \tan \theta$$

Question 47

$$\left[\frac{1 + \sin \theta - \cos \theta}{1 + \sin \theta + \cos \theta} \right]^2 = \frac{1 - \cos \theta}{1 + \cos \theta}$$

Question 48:

$$(\sec \theta + \tan \theta - 1)(\sec \theta - \tan \theta + 1) = 2 \tan \theta$$

Question 49:

$$\text{If } \operatorname{cosec} \theta - \sin \theta = a^3, \sec \theta - \cos \theta = b^3, \text{ Prove that } a^2 b^2 (a^2 + b^2) = 1$$

Question 50:**Prove that :**

$$(i) \quad \sqrt{\frac{\sec \theta - 1}{\sec \theta + 1}} + \sqrt{\frac{\sec \theta + 1}{\sec \theta - 1}} = 2 \operatorname{cosec} \theta$$

$$(ii) \quad \sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}} + \sqrt{\frac{1 - \sin \theta}{1 + \sin \theta}} = 2 \sec \theta$$

$$(iii) \quad \frac{\sec \theta - 1}{\sec \theta + 1} = \left(\frac{\sin \theta}{\cos \theta + 1} \right)^2$$

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