

Trigonometry Questions

Question 1.

If $\sec \theta + \tan \theta = p$, then find the value of $\operatorname{cosec} \theta$.

Question 2.

If A and B acute angles such that $\tan A = \frac{1}{2}$, $\tan B = \frac{1}{3}$ and

$$\tan (A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}, \text{ find } A + B.$$

Question 3.

Prove that

a) $\tan 10^\circ \tan 15^\circ \tan 75^\circ \tan 80^\circ = 1$

b) $\tan 1^\circ \tan 2^\circ \tan 3^\circ \dots \tan 89^\circ = 1$

c) $\cos 1^\circ \cos 2^\circ \cos 3^\circ \dots \cos 180^\circ = 0$

Question 4.

Prove the following identities, where the angles involved are acute angles for which the expressions are defined.

a) $\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} = 2 \sec A$

b) $\frac{1 + \sec A}{\sec A} = \frac{\sin 2A}{1 - \cos A}$

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

Question 5.

In a ΔABC right angled at C, if $\tan A = \frac{1}{\sqrt{3}}$, find the value of

$$\sin A \cos B + \cos A \sin B.$$

Question 6.

If $\sec \theta - \tan \theta = x$, show that:

$$\sec \theta = \frac{1}{2} \left[x + \frac{1}{x} \right] \text{ and } \tan \theta = \frac{1}{2} \left[\frac{1}{x} - x \right]$$

Question 7.

If $\tan \theta = \frac{12}{5}$, find the value of $\frac{1+\sin \theta}{1-\sin \theta}$

Question 8.

If $\sin \theta + \cos \theta = \sqrt{2} \cos(90^\circ - \theta)$, find $\cot \theta$.

Question 9.

If $\tan (A + B) = \sqrt{3}$ and $\tan (A - B) = \frac{1}{\sqrt{3}}$;

And $0 < A + B \leq 90^\circ$; $A > B$

find A and B

Question 10.

Prove that

If $\tan^2 \theta = 1 - p^2$, then prove that $\sec \theta + \tan^3 \theta \operatorname{cosec} \theta = (2 - p^2)^{3/2}$.

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