

Answer the questions

- (1) Simplify $\frac{\cos\theta}{1-\tan\theta} + \frac{\sin^2\theta}{\sin\theta-\cos\theta}$
- (2) If $x = r \sin \alpha \cos \beta$, $y = r \sin \alpha \sin \beta$ and $z = r \cos \alpha$, prove that $x^2 + y^2 + z^2 = r^2$.
- (3) If $\triangle XYZ$ is right angled at Z, find the value of $\sin(X+Y)$.
- (4) If $\operatorname{cosec} \theta - \sin \theta = m$ and $\sec \theta - \cos \theta = n$, prove that $(m^2n)^{\frac{2}{3}} + (mn^2)^{\frac{2}{3}} = 1$.
- (5) From a tower on a straight road, the angles of depression of two cars at an instant are 45° and 60° . If the cars are 10 m apart, find the height of the tower.
- (6) Find the value the given expression.

$$\frac{\cos 46^\circ 38'}{\sin 43^\circ 22'}$$
- (7) If $12 \cot \theta = 6$, find the value of $\frac{36 \cos \theta + 34 \sin \theta}{6 \sin \theta - 5 \cos \theta}$.
- (8) Simplify $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}$.
- (9) Without using trigonometric tables, evaluate the value of $\tan 9^\circ \tan 81^\circ - \cot 81^\circ \cot 9^\circ$.
- (10) Simplify $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} + \sqrt{\frac{1-\cos\theta}{1+\cos\theta}}$
- (11) Simplify $1 + \frac{\tan^2\beta}{1 + \sec\beta}$.
- (12) If $\cot A = \frac{20}{21}$, find $\sin A$.

Choose correct answer(s) from the given choices

- (13) $\operatorname{cosec}^4\theta - \operatorname{cosec}^2\theta$
 - a. $\tan^2\theta + \cot^4\theta$
 - b. $\cot^2\theta - \cot^4\theta$
 - c. $\cot^2\theta + \tan^4\theta$
 - d. $\cot^2\theta + \cot^4\theta$
- (14) $(\sin\theta + \sec\theta)^2 + (\cos\theta + \operatorname{cosec}\theta)^2 = ?$
 - a. $(1 + \sec \theta \operatorname{cosec} \theta)^2$
 - b. $(1 - \sin \theta \cos \theta)^2$
 - c. $(1 + \sin \theta \cos \theta)^2$
 - d. $(\sec \theta \operatorname{cosec} \theta)^2$

Check True/False

(15) $\sin 36^\circ - \cos 36^\circ < 0$

☐ True

☐ False



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Answers

- (1) $\sin\theta + \cos\theta$
(2)
(3) 1
(4)
(5) $5(3 + \sqrt{3})$ m
(6) 1
(7) $\frac{104}{7}$
(8) $\sec\theta - \tan\theta$
(9) 0
(10) $2 \operatorname{cosec}\theta$
(11) $\sec\beta$
(12) $\frac{21}{29}$
(13) d. $\cot^2\theta + \cot^4\theta$
(14) a. $(1 + \sec\theta \operatorname{cosec}\theta)^2$
(15) True