Topper's Secret Questions

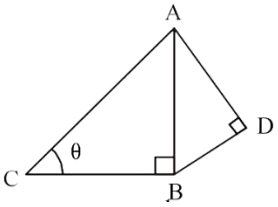
Trigonometry

1. If $5\tan\theta - 4 = 0$, then the value of $\frac{5\sin\theta - 4\cos\theta}{5\sin\theta + 4\cos\theta}$ is

(A) $\frac{5}{3}$ (B) $\frac{5}{6}$ (C) 0 (D) $\frac{1}{6}$

2. In given fig., If $AD = 4cm,\ BD = 3\ cm$ and $CB = 12\ cm$, then $\cot\theta =$

(A) $\frac{12}{5}$ (B) $\frac{5}{12}$ (C) $\frac{13}{12}$ (D) $\frac{12}{13}$



3. Given that $\sin\theta = \frac{a}{b}$, then $\cos\theta$ is equal to

(A) $\frac{b}{\sqrt{b^2-a^2}}$ (B) $\frac{b}{a}$ (C) $\frac{\sqrt{b^2-a^2}}{b}$ (D) $\frac{2}{\sqrt{b^2-a^2}}$

4. Given that $\sin\alpha = \frac{1}{2}$ and $\cos\beta = \frac{1}{2}$, then the value of $(\alpha + \beta)$ is

(A) $0°$ (B) $30°$ (C) $60°$ (D) $90°$

5. Given $\tan\theta = \frac{1}{\sqrt{3}}$, find the value of $\frac{cosec^2\theta - sec^2\theta}{cosec^2\theta + sec^2\theta}$.

6. Prove that:- $sec^4\theta - sec^2\theta = tan^4\theta + tan^2\theta$

7. If $x = p\ sec\theta + q\ tan\theta$ & $y = p\ tan\theta + q\ sec\theta$ then prove that $x^2 - y^2 = p^2 - q^2$.

8. If $7\ sin^2\theta + 3\ cos^2 2\theta = 4$ then show that $\tan\theta = \frac{1}{\sqrt{3}}$.

9. If $\sin(A - B) = \frac{1}{2}$, $\cos(A + B) = \frac{1}{2}$ then find the value of A and B.

10. If $\tan(3x - 15°) = 1$ then find the value of x.

11. Find the value of θ, if $\frac{\cos\theta}{1-\sin\theta} + \frac{cos\theta}{1+\sin\theta} = 4, \theta \leq 90°$.

12. Prove that: $\frac{\tan A + \sec A - 1}{\tan A - \sec A + 1} = \frac{1+\sin A}{Cos\ A}$

13. Prove that: $\frac{1}{\sec x - \tan x} - \frac{1}{\cos x} = \frac{1}{\cos x} - \frac{1}{\sec x + \tan x}$

14. If $sin\,\theta + sin^2\,\theta = 1$, prove that $cos^2\theta + cos^4\theta = 1$

15. If $a\,cos\,\theta + b\,sin\,\theta = m$ and $a\,sin\,\theta - b\,cos\,\theta = n$. Prove that:

$a^2 + b^2 = m^2 + n^2$.

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

17. Prove: $(\sin\alpha + \cos\alpha)(\tan\alpha + \cot\alpha) = \sec\alpha + cosec\,\alpha$

18. Prove:- $1 + \frac{cot^2\alpha}{1+cosec\,\alpha} = cosec\alpha$

19. Simplify $(1 + tan^2\,\theta)\,(1 - sin\,\theta)\,(1 + sin\theta)$

20. If $2sin^2\theta - cos^2\theta = 2$,then find the value of θ.

21. Prove that:

$2\,(sin^6\,\theta + cos^6\theta) - 3\,(sin^4\theta + cos^4\theta) + 1 = 0$

22. Prove that:

$(1 + cot\,A + tan\,A)\,(sin\,A - cos\,A) = sin\,A\,tan\,A - cot\,A\,cos\,A$

23. If $sin\,\theta + cos\,\theta = m$ and $\sec\theta + cosec\,\theta = n$ then show that $n(m^2 - 1) = 2m$.

24. Prove that: $sec^2\theta - \frac{sin^2\theta - 2sin^4\theta}{2cos^4\theta - cos^2\theta} = 1$

25. If $sin\,\theta + cos\,\theta = \sqrt{3}$, then prove that $tan\,\theta + cot\,\theta = 1$

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

27. If $cosec\,\theta + \cot\theta = p$, then prove that $cos\theta = \frac{p^2-1}{p^2+1}$.

28. Prove that: $\sqrt{sec^2\,\theta + cosec^2\theta} = \tan\theta + \cot\theta$

29. If $1 + sin^2\theta = 3\sin\theta\cos\theta$, prove that $\tan\theta = 1\ or\ \frac{1}{2}$.

30. If $\tan\theta + \sec\theta = l$, then prove that $\sec\theta = \frac{l^2+1}{2l}$.

ANSWER'S

Q1. C

Q2. A

Q3. C

Q4. D

Q5. $\frac{1}{2}$

Q9. $A = 45°, B = 15°$

Q10. $20°$

Q11. $60°$

Q19. 1

Q20. $90°$