Advanced Mathematics

Worksheet #1

Simplifying Trigonometric Expressions

Simplify the expressions to a real number or to a value of one of the trigonometric functions, or some combination of the two.

1. $\sin^2 A \cdot \cot A \cdot \csc A$

2. $\dfrac{1 - \cos^2 A}{\sin^2 A}$

3. $\dfrac{\tan^2 A}{1 - \sec^2 A}$

4. $\tan^2 A \,(\csc^2 A - 1)$

5. $\dfrac{\sec^2 A - 1}{\tan^2 A}$

6. $\dfrac{\tan A + 1}{\sec A}$

7. $\dfrac{\cos^2 A - 1}{\sin^2 A - 1}$

8. $\cos A \cdot \csc A \,(\sec^2 A - 1)$

9. $\dfrac{\sec A \cdot \tan A}{\tan^2 A + 1}$

10. $\dfrac{\cos^2 A - 1}{\cos^2 A \cdot \tan^2 A}$

11. $\cos A \,(\sec A - \cos A)$

12. $\dfrac{\tan A}{\tan A + \cot A}$

13. $\dfrac{\sin A - \csc A}{\csc A} + \sin^2 A \cdot \cot^2 A$

14. $\dfrac{\cot^2 A \cdot \cos^2 A}{\cot^2 A - \cos^2 A}$

15. $\dfrac{1 - \cos^2 A}{1 + \cos A}$

16. $\tan A \cdot \cos A$

17. $\tan A \cdot \cot A$

18. $\sec^2 A - \tan^2 A$

19. $3\sqrt{\csc^2 A - \cot^2 A}$

20. $\dfrac{1}{2}\cos A \cdot \sec A$

21. $\sin A \cdot \cos A \cdot \csc A$

22. $\sin^2 A + \sin A + \cos^2 A - 1$

23. $\cos A \,(\tan A + \cot A)$

24. $\sqrt{\cot^2 A + 1}$

25. $\sqrt{1 - \cos^2 A}$

26. $\dfrac{\sqrt{1 - \sin^2 A}}{\sin A}$

27. $\sqrt{\dfrac{\tan^2 A + 1}{\cot^2 A + 1}}$

28. $\dfrac{\cos A \,(\cos^2 A + \sin^2 A)}{\sin A \cdot \csc A}$

29. $\dfrac{\sec A \cdot (1 + \sin A)}{1 + \csc A}$

30. $\sin A \,(\sec A - \csc A) - \tan A$

31. $(1 - \sin A)(\sec A + \tan A)$

32. $\dfrac{1}{\sec A}(\tan A + \cot A)$