

1. Verify the formula for the derivative of $\csc x = \frac{1}{\sin x}$.

2. Verify the formula for the derivative of $\cot x = \frac{\cos x}{\sin x}$.

Find the derivatives of the functions in exercises 3-36. Simplify your answers whenever possible. Also be on the lookout for ways you might simplify the given expression before differentiating it.

3. $y = \cos 3x$

4. $y = \sin \frac{x}{5}$

5. $y = \tan \pi x$

6. $y = \sec ax$

7. $y = \cot(4 - 3x)$

8. $y = \sin\left(\frac{\pi-x}{3}\right)$

9. $f(x) = \cos(s - rx)$

10. $y = \sin(Ax + B)$

11. $\sin(\pi x^2)$

12. $\cos(\sqrt{x})$

13. $y = \sqrt{1 + \cos x}$

14. $\sin(2 \cos x)$

15. $f(x) = \cos(x + \sin x)$

16. $g(\theta) = \tan(\theta \sin \theta)$

17. $u = \sin^3(\pi x/2)$

18. $y = \sec\left(\frac{1}{x}\right)$

19. $F(t) = \sin at \cos at$

20. $G(\theta) = \frac{\sin a\theta}{\cos b\theta}$

21. $\sin(2x) - \cos(2x)$

22. $\cos^2 x - \sin^2 x$

23. $\tan x + \cot x$

24. $\sec x - \csc x$

25. $\tan x - x$

26. $\tan(3x) \cot(3x)$

27. $t \cos t - \sin t$

28. $t \sin t + \cos t$

29. $\frac{\sin x}{1 + \cos x}$

30. $\frac{\cos x}{1 + \sin x}$

31. $x^2 \cos(3x)$

32. $g(t) = \sqrt{(\sin t)/t}$

33. $v = \sec(x^2) \tan(x^2)$

34. $z = \frac{\sin \sqrt{x}}{1 + \cos \sqrt{x}}$

The End