

Find the derivative of the following functions.

1. $f(x) = (3x^2 - 4)^5$

2. $f(x) = 3x^2 (2^{3x})$

3. $f(x) = e^{2x-1} (3x+4)^3$

4. $g(x) = \frac{e^{x^2}}{(2x-1)^3}$

5. $g(x) = (e^{2x} + x) + (3x^2 - 2x + x)^4$

6. $f(x) = \frac{(2-3x^2)^5}{5x}$

7. $y = \cos^3(\sqrt{x})$

$$8. \quad y = \left(\frac{\cos x}{1 - \sin x} \right)^2$$

$$9. \quad y = (17x^2 - 5x)^{50}$$

$$10. \quad y = e^{2x}(\sin(3x))$$

$$11. \quad y = \sqrt{\sin x}$$

$$12. \quad y = \frac{\tan x}{x^2 - 1}$$

$$13. \quad y = \arcsin(x^2)$$

$$14. \quad y = (x^2 + 1)\arctan(x)$$

$$15. y = [\arccos(x)]^3$$

$$16. y = \tan(6x)$$

$$17. y = \frac{\sin 2x}{\cos 2x}$$

$$18. y = \frac{\sin x}{x^2}$$

$$19. y = \tan(\sin x) + \frac{1}{\pi}$$

$$20. y = 3 \cos(5x) + 3 \sin(x^9)$$

$$21. y = \sin^3(3x^2 - 2x + 1)$$

$$22. y = x^2 \tan\left(\frac{1}{x}\right)$$

$$23. f(x) = \sin^2(\sqrt{x})$$

$$24. g(x) = e^{3x} \cos(2x)$$

$$25. y = [\arcsin(x^3)]^4$$

$$26. y = \tan(6x^2 - 1)$$

$$27. y = \sin(3)e^x$$

$$28. y = \frac{\sec^2 x - \tan^2 x}{x^3}$$

$$29. y = \frac{\cos x}{x^3}$$

$$30. y = \sin(\sin(4x)) + \frac{1}{e}$$

$$31. y = \cos^2(3x^2 - 7x)$$

$$32. y = x^3 \sin\left(\frac{1}{x}\right)$$

$$33. y = \cos^4(\sqrt{x})$$

$$34. y = \frac{\tan x}{2x-1}$$

$$35. y = \sqrt[3]{\sin x - 1}$$

$$36. y = (\sin x)e^{3x} + \pi^2$$

$$37. y = \frac{\pi}{e^x + e^{-x}}$$

$$38. y = \frac{1}{7}\sin x - \frac{1}{6}\cos x$$

$$39. y = \frac{\csc^2 x - \cot^2 x}{x}$$

$$40. y = \frac{\cos(9x)}{\sin(9x)}$$

$$41. y = \sin(\tan x) + \frac{1}{37}$$

$$42. y = 4x^5 \tan\left(\frac{-1}{x}\right)$$