

Differentiation Drill

Find the derivatives of the following functions:

1. $f(x) = 3x^5 - 5x^3 + 7$

2. $y = \frac{x^2 + bx + c}{a}$

3. $l(s) = \sinh(\ln(s^2))$

4. $g(t) = e^{1/t}$

5. $f(t) = e^\pi$

6. $f(x) = (5x + 5)^{1001}$

7. $f(x) = \frac{x - 1}{\sqrt[3]{x^4}}$

8. $f(\theta) = \sqrt[3]{\tan(5\theta)}$

9. $h(r) = \pi^r r^\pi$

10. $y = \ln \sqrt{5 + x^2}$

11. $g(x) = x^{\cos x}$

12. $h(x) = \arcsin(x^7)$

13. $f(\alpha) = \sinh(7\alpha) \sin(7\alpha)$

14. $f(x) = \frac{\ln x}{1 + \ln x}$

15. $y = e^{\sin(\ln x)}$

16. $f(\theta) = \csc(\cot \theta)$

17. $g(x) = \sqrt{x}(x^{-3/4} + 2x^2)$

18. $y = \sqrt[3]{1 + \sqrt{x}}$

19. $f(x) = \ln \left(\frac{x + 1}{x^2 + 1} \right)$

20. $h(t) = t^3 e^{3t} \sin\left(\frac{t}{3}\right)$

21. $h(x) = (x^{1/2} + x^{2/3})(x^{3/4} + x^{4/5})$

22. $p(s) = \sec \left(\frac{1 + \ln s}{s^2 \cos s} \right)$

23. $f(x) = 5^x \sec x$

24. $a(t) = \frac{\sqrt{t+1}(2-t)^5}{(t+3)^7}$

25. $f(y) = \ln(2y) \cos(2y)$

26. $y = \frac{1}{\arctan x}$

27. $g(x) = e^{e^x}$

28. $x(y) = (\sin(y - \sin y))^{-1}$

29. $f(x) = \sin x(\sin x + \cos(-17x))$

30. $g(t) = \frac{t - 1}{t^2 - 1}$

31. $t(x) = \frac{4x^{3/4}}{3} - x^{-1}$

32. $f(x) = \cosh(\ln(e^2))$