Derivative Practice Worksheet

Find the derivative of the given function with respect to x.
Show all necessary work.

1. $y = 3$

2. $f(x) = -2$

3. $y = 5 + sinx$

4. $g(x) = x^2 + 4$

5. $s(t) = t^3 - 2t + 4$

6. $y = sinx$

7. $y = tanx$

8. $y = cotx$

9. $y = cosx$

10. $y = cscx$

11. $f(x) = x^2 - \frac{1}{2}cos x$

12. $g(x) = \frac{1}{x} - 3sinx$

13. $f(x) = secx + 3x$

14. $g(t) = \pi cost$

15. $h(x) = \frac{1}{3x^3}$

16. $y = \frac{\sqrt{x}}{x}$

17. $f(x) = x^3 - 3x - 2x^{-4}$

18. $y = \frac{3x-2}{2x-3}$

19. $g(x) = (x^2 - 2x + 1)(x^3 - 1)$

24. $g(x) = \sqrt{x} + 4\sec x$

20. $y = x\cos x$

25. $y = -\csc x - \sin x$

21. $f(x) = \frac{x+1}{\sqrt{x}}$

26. $f(x) = x^2 \tan x$

22. $f(x) = (x + 1)\cos x$

27. $f(x) = (3x - 2x^2)^3$

23. $y = x + \cot x$

28. $g(x) = \dfrac{e^x}{1-e^x}$

29. $y = \left(\dfrac{3x-1}{x^2+3}\right)^2$

30. $y = \cos(3x)^2$

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

32. $f(x) = \sin^3 4x$

33. $y = \ln\sqrt{\dfrac{x+3}{x-2}}$

34. $y^3 = x$

35. $y = x2^x$

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

37. $y = \cos 3x^2$

38. $y = \sqrt[3]{9x^2 + 4}$

39. $y = (\cos 3)x^2$
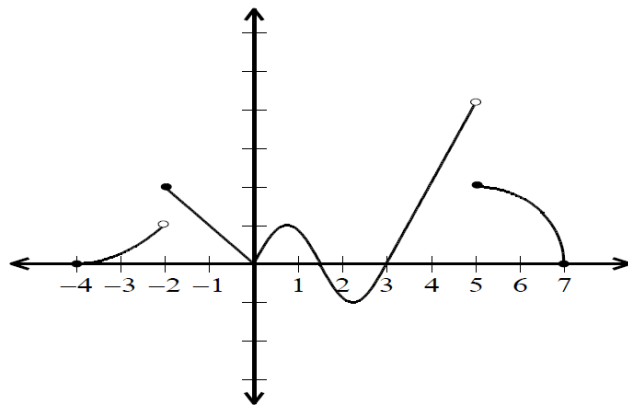
40. $y = \frac{x}{2^{3x}}$

41. $x^3 - xy + y^2 = 4$

42. $y = (x + 1)^x$

43. $y = 5\log_3(x^2 + 1)^2$

44. Find f' if $f(\theta) = \theta\cos\theta$

45. Find $\dfrac{dy}{dx}$ if $y = \dfrac{x^2+5x-3}{2x+7}$

46. Identify the x-values in the open interval (-4, 7) where the function is not differentiable.

47. If $f(x) = x^2 - 3x + 4$:

a. Find AROC over [-1,3]

b. Find the equation of the line tangent to $f(x)$ at
x = 0.

48. Use Limit Definition of a Derivative to find f'(x):

$f(x) = -2x^2 + 4x - 5$

49. Find G'(x) if $G(x) = 6\sqrt[3]{5 - 4x}$

50. Find y' if

$y = (4x + 1)(1 - x)^3$

51. Find f'(x) if $f(x) = \sin^2(3x + 2)$