

Derivative Review Worksheet

Find the first derivative without a calculator.

1. $f(x) = x^8 - 3\sqrt{x} + 5x^{-3}$

2. $f(x) = \sqrt{3x+1}(x-1)^2$

3. $f(x) = \left(\frac{3x+1}{x^2}\right)^3$

4. $f(x) = (1 + \sec x)(x^2 - \tan x)$

5. $f(x) = \cot\left(\frac{\csc 2x}{x^3 + 5}\right)$

6. $f(x) = \frac{1}{2x + \sin^3 x}$

7. $f(x) = \ln 2x$

8. $f(x) = \ln\left(\sqrt[3]{x+1}\right)$

9. $f(x) = 2xe^{\sqrt{x}}$

10. $f(x) = 2^{\sin^{-1} x}$

11. $f(x) = \sec^{-1}[2x+1]$

12. $f(x) = \sqrt{\cos^{-1} x^2}$

13. Using a calculator approximate the values of x (3 decimal places) at which the tangent line to the graph of $y = x^3 - \sin x$ is horizontal.

14. Find dy/dx using logarithmic differentiation. $y = \sqrt[3]{\frac{x^2 - 1}{x^2 + 1}}$

15. Find the line tangent to $f(x) = 4x^3 - 2x^2 + 1$ that goes through the origin. Include a sketch. For the final answer round to three decimal places.