

First work through the recommended practice problems listed in the following table from the 11th edition of *Calculus of a Single Variable* by Larson and Edwards. You do not need to hand these in. Once you have completed these, then do the small sampling of questions below. Write full solutions (not just the final answer) in the space provided.

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5.1 The Natural Logarithmic Function: Differentiation	9, 11, 13, 23, 25, 27, 31, 35, 39, 47, 49, 55, 57, 59, 63, 67, 69, 75, 77, 81, 89, 101
5.2 The Natural Logarithmic Function: Integration	5, 7, 9, 11, 13, 15, 19, 23, 25, 27, 33, 39, 41, 43, 51, 53, 57, 61, 69, 71, 75, 85, 86, 87, 89, 91
5.3 Inverse Functions	5, 7, 13, 19, 23, 39, 43, 55, 59, 65, 73, 75
5.4 Exponential Functions: Differentiation and Integration	3, 5, 7, 11, 15, 17, 19, 23, 31, 33, 35, 39, 43, 45, 49, 51, 61, 63, 67, 75, 79, 91, 101, 105, 109, 111, 113, 117, 125
5.5 Bases Other Than e and Applications	5, 11, 13, 15, 17, 21, 23, 25, 27, 33, 39, 41, 45, 51, 55, 65, 67, 69, 73, 77

Sec 5.1 #62: Find the derivative of the function $f(x) = \ln(x + \sqrt{4 + x^2})$.

Sec 5.1 #78: Use logarithmic differentiation to find dy/dx : $y = \sqrt{\frac{x^2 - 1}{x^2 + 1}}$, $x > 1$

Sec 5.2 #22: Find the indefinite integral: $\int \frac{x^3 - 4x^2 - 4x + 20}{x^2 - 5} dx$

Sec 5.2 #24: Find the indefinite integral: $\int \frac{1}{x(\ln x^2)^3} dx$

Sec 5.2 #76: Find the average value of the function $f(x) = \sec \frac{\pi x}{6}$ over the interval $[0, 2]$.

Sec 5.3 #64: Verify that $f(x) = x^3 + 3x - 1$ has an inverse. Then find $(f^{-1})'(-5)$.

Sec 5.4 #46: Find the derivative of $y = \ln\left(\frac{1+e^x}{1-e^x}\right)$.

Sec 5.4 #64: Use implicit differentiation to find dy/dx : $e^{xy} + x^2 - y^2 = 10$

Sec 5.4 #98: Find the indefinite integral $\int \frac{e^{1/x^2}}{x^3} dx$.

Sec 5.4 #116: Evaluate the definite integral $\int_{-2}^0 \frac{e^{x+1}}{7 - e^{x+1}} dx$.

Sec 5.5 #48: Find the derivative of $g(\alpha) = 5^{-\alpha/2} \sin 2\alpha$.

Sec 5.5 #66: Use logarithmic differentiation to find dy/dx for the function $y = x^{x-1}$.

Sec 5.5 #70: Find the indefinite integral $\int 2^{-x} dx$.