CHAOS – Review 5.1-5.4 Test Name _____

5.1

Find the derivative of the function.

47. $y=(\ln x)^4$ 53. $g(t)=\dfrac{\ln t}{t^2}$ 59. $f(x)=\ln\left(\dfrac{\sqrt{4+x^2}}{x}\right)$

Find the equation of the tangent line to the graph of *f* at the given point.

71. $f(x)=3x^2-\ln x \quad (1,3)$

Find the extrema and inflection points

86. $y=\dfrac{\ln x}{x}$

Use logarithmic differentiation to find $\dfrac{dy}{dx}$

97. $y=\dfrac{x(x-1)^{3/2}}{\sqrt{x+1}}$

5.2

Find the indefinite integral.

5. $\int \dfrac{1}{3-2x}\,dx$ 11. $\int \dfrac{x^2+2x+3}{x^3+3x^2+9x}\,dx$ 23. $\int \dfrac{2x}{(x-1)^2}\,dx$

Find the indefinite integral by u-substitution. (Hint: Let u be the denominator of the integrand)

25. $\int \dfrac{1}{1+\sqrt{2x}}\,dx$

Find the indefinite integral.

31. $\int \csc 2x\,dx$

Find the definite integral.

49. $\int_1^e \dfrac{(1+\ln x)^2}{x}\,dx$

Find the average value of the function over the given interval.

89. $f(x)=\frac{\ln x}{x} \quad [1,e]$

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5.4

Find the derivative

35. $f(x)=e^{2x}$ 41. $y=\ln\left(1+e^{2x}\right)$

Find an equation of the tangent line to the graph of the function at the given point.

53. $y=x^2e^x-2xe^x+2e^x \quad (1,e)$

Use implicit differentiation to find $\frac{dy}{dx}$

58. $e^{xy}+x^2-y^2=10$

Find the integral

85. $\int e^{5x}(5)\,dx$ 89. $\int \frac{e^{-x}}{1+e^{-x}}dx$ 91. $\int e^x\sqrt{1-e^x}\,dx$ 97. $e^{-x}\tan\left(e^{-x}\right)dx$

Evaluate the definite integral.

103. $\int_1^3 \frac{e^{3/x}}{x^2}dx$ 106. $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} e^{\sec 2x}\sec 2x\tan 2x\,dx$