HW 5.1

Find the derivative of the function.

45. $g(x) = \ln x^2$

48. $y = x \ln x$

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

54. $h(t) = \dfrac{\ln t}{t}$

57. $y = \ln\sqrt{\dfrac{x+1}{x-1}}$

60. $f(x) = \ln\left(x + \sqrt{4+x^2}\right)$

63. $y = \ln|\sin x|$

66. $y = \ln|\sec x + \tan x|$

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

72. $f(x) = 4 - x^2 - \ln\left(\dfrac{1}{2}x + 1\right),\ (0,4)$

75. $f(x) = x^3 \ln x,\ (1,0)$

Use implicit differentiation to find dy/dx.

77. $x^2 - 3\ln y + y^2 = 10$

Locate any relative extrema.

84. $y = x - \ln x$

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

Use logarithmic differentiation to find dy/dx.

93. $y = x\sqrt{x^2-1}$

96. $y = \sqrt{\dfrac{x^2-1}{x^2+1}}$