

## Derivative Practice

Find the derivatives of the following functions.

1.  $y = x^2 + \ln(x) + 2^x$

2.  $y = x + (\ln x)^2$

3.  $y = x + \ln(x^2)$

4.  $y = \ln(3x^2 + 2)$

5.  $y = \frac{1}{x} + \ln(x)$

6.  $h(x) = 5 \ln(x) + \left(\frac{1}{10}\right)^x$

7.  $y = 3 \ln(3x^2)$  Hint: use the log rules first then differentiate.

8.  $y = x \ln(x)$

9.  $f(x) = \frac{\ln x}{x}$

10.  $h(x) = \frac{\ln(x^2)}{5e^{3x}}$

11.  $h(x) = x \ln\left(\frac{1}{x}\right)$

12.  $f(x) = \ln\left(\frac{e^x + e^{-x}}{2}\right)$

13.  $g(x) = 2^3 \ln 4$

14.  $f(x) = \log(x + \sqrt{4 + x^2})$

15.  $k(x) = \frac{x + \ln\left(\frac{1}{x}\right)}{x^2}$

16.  $R = \frac{\ln(2x^3)}{3e^x}$

17.  $C = x^\pi + \pi^x + \ln\left(\frac{\pi}{x}\right)$

18.  $f(x) = x^2 + \ln\left(x\sqrt{\frac{61}{2x}}\right)$

19.  $y = 20 \ln\left(\frac{e^x}{100}\right)$

20.  $y = 20x^{\frac{2}{3}}e^{-x}$