

1. For each function, find its derivative.

(a)  $f(x) = e^x - 7x$

(b)  $f(x) = \ln(x) - x^2 + 3x + \ln(2)$

(c)  $f(x) = x^e - \ln(x) + 3^x$

(d)  $f(x) = \ln(7)e^x - 3x^{\ln(12)} + 5e^8 - (\ln(3))^x$

2. Let  $f(x) = \ln(x) - \frac{x^2}{20}$

Find the maximum and minimum values of  $f(x)$  on the interval  $[1, 12]$ .