

Please show all work and box your final answers. If you need more room, you may use the backs of the pages. Calculators are not allowed. Good luck!

1. Find $(f^{-1})'(a)$, where $f(x) = 5x^3 + 5x + 12$ and $a = 12$.

2. Find the domain of $f(x) = \ln(\ln(\ln x))$.

3. Differentiate the following functions.

(a) $y = \ln \frac{1 + 2x}{3 - 4x}$

(b) $y = 9^x$

(c) $y = x^{\sin x}$

4. Evaluate the following integrals.

(a) $\int \frac{e^x + 2}{3e^x} dx$

(b) $\int_2^4 \frac{2^{x-1}}{2^{x-1} + 1} dx$