

Assignment 8

1 Find $\frac{dy}{dx}$

(a) $x = \ln t$, $y = \frac{1}{t}$, $1 \leq t \leq 2$

(b) $y = e^{x^2}$

(c) $y = \ln(\ln x)$

(d) $y = e^{e^x}$

(e) $y = \int_1^{\ln x} e^t dt$

2. (a) Let $f(x) = e^{-2x}$ find the simplest exact value of $f(\ln 3)$

(b) Express π^{-x} as a power of e

3 Find $\int \frac{1}{x \ln x} dx$

4 Find

(a) $\lim_{x \rightarrow 0} \frac{\sin x - x}{x^3}$

(b) $\lim_{x \rightarrow 1} \frac{12 \sin \frac{\pi}{2x} \ln x}{(x^3 + 5)(x - 1)}$

(c) $\lim_{x \rightarrow \pi} \frac{\sin^2 x}{\tan^2 4x}$