

Warm-up Problems - January 27, 2006

1. The formula for future values of a continuous income stream is:

$$FV = e^{rT} \int_0^T f(t)e^{-rt} dt$$

Explain what each term stands for:’

- (a) $f(t)$
 - (b) r
 - (c) T
 - (d) FV (what does future value mean?)
2. What is the equation $FV = Pe^{rt}$? Why isn't this used for an income stream? (In what situations is this equation used?)

3. Find the following integrals:

(a) $\int \frac{x^2}{x^3+1} dx$

(b) $\int xe^{7x^2+5} dx$

Lecture Problems

4. Find the Gini index for the Lorenz curve $f(x) = xe^{x-1}$.
5. For each of the following integrals, identify the method to use to integrate. Choices: Easy integral, substitution, integration by parts.

(a) $\int x^3 - 3x \, dx$

(b) $\int e^{4x} \, dx$

(c) $\int \ln x \, dx$

(d) $\int x \ln x \, dx$

(e) $\int \frac{\ln x}{x} \, dx$

(f) $\int x^5 e^{2x} \, dx$

(g) $\int e^{x^2} \, dx$

(h) $\int e^x + x^3 \, dx$