Homework Day 10 - ECON 186

Problem 1. Chiang and Wainwright 14.2 #1(a, b, c, e), 2(a,f)

#1
Find the following:
(a) $\int 16x^{-3}dx (x \neq 0)$ (c) $\int (x^5 - 3x)dx$
(b) $\int 9x^8 dx$ (e) $\int \frac{4x}{x^2+1}dx$
#2
Find:
(a) $\int 13e^x dx$ (f) $\int xe^{x^2+9}dx$

Problem 2. Chiang and Wainwright 14.3 #1(a, d), 2(b)

#1
Evaluate the following:
(a) $\int_1^3 \frac{1}{2}x^2 dx$ (d) $\int_2^4 (x^3 - 6x^2)dx$
#2
Evaluate the following:
(b) $\int_{-1}^{e-2} \frac{dx}{x+2}$

Problem 3. Chiang and Wainwright 14.4 #3(a, d)

#3
Evaluate all the improper integrals:
(a) $\int_0^\infty e^{-rt}dt$ (d) $\int_{-\infty}^0 e^{rt}dt$

Problem 4.

Evaluate $\int_{-\infty}^{\infty} \frac{2x}{(x^2+1)^2}dx$

Problem 5.

Suppose that a random variable X has a discrete distribution with the following probability mass function:

$$f(x) = \begin{cases} \frac{c}{2^x} & x = 0, 1, 2, ... \\ 0 & otherwise \end{cases} \quad (1)$$

Find the value of the constant c.

Problem 6.

Suppose that the *pdf* of a random variable X is as follows

$$f(x) = \begin{cases} \frac{4}{3}(1 - x^3) & 0 < x < 1 \\ 0 & otherwise \end{cases} \quad (2)$$

Find the following probabilities:
(a) $Pr = (X < \frac{1}{2})$
(b) $Pr = (\frac{1}{4} < X < \frac{3}{4})$
(c) $Pr = (X > \frac{1}{3})$