Problem set 4

Integration

1. Find the indefinite integral of:
    a. $x + 1$
    b. $-2x^2$
    c. xe^x
2. Find the definite integral between 0 and 2 of:
    a. $2x - 2$
    b. $e^{0.5x}$
3. Which of these improper integrals exists?
    a. $\int_0^2 x^2\,dx$
    b. $\int_0^\infty e^{-2x}\,dx$

4. Use the substitution method to integrate the following

$$\int_0^2 \frac{3x^2}{(x^3+1)^2}\,dx$$

5. Integrate by parts

$$\int_2^5 \frac{3x}{(x+1)^2}\,dx$$

6. Given the demand function $P = 42 - 5Q - Q^2$. Find the consumer surplus at the equilibrium price of $p = 6$.

7. Given Investment $I(t) = 9t^{0.5}$ find the level of capital stock in a) after 8 years b) between years 5 and 8.