

Instructions: This homework is an individual effort. Answer each question. This is due on **Monday, April 20th. Show all work to receive full credit.**

1. Evaluate the following integrals:

a. $\int x(1 - 5x^2)^5 dx$

b. $\int \frac{\sqrt{\ln(x)}}{x} dx$

c. $\int 6qe^{q^2+1} dq$

d. $\int \frac{4x^3}{x^4 + 1} dx$

e. $\int \frac{e^t}{e^t + 5} dt$

f. $\int \frac{e^x - e^{-x}}{e^x + e^{-x}} dx$

g. $\int \frac{e^{\sqrt{y}}}{\sqrt{y}} dy$

h. $\int \frac{x + 1}{x^2 + 2x + 19} dx$

i. $\int_7^8 x(x - 7)^8 dx$

2. Suppose we have the inverse demand function $p = D(q) = 100 - 4q$, and suppose that equilibrium quantity $q^* = 5$. Determine the consumer surplus.

3. Suppose we have the inverse demand function $p = D(q) = 35 - q$ and the inverse supply function $p = S(q) = 3 + q$. Determine the producer and consumer surplus.

4. Suppose we have the supply function $q = S(p) = 10p - 30$ and demand function $q = D(p) = 30 - 2p$. Determine the producer and consumer surplus.