ECO137 Homework Questions for Chapter 9 'Integration'

1. Find the following integrals.

(a) $\int x\sqrt{x}dx$ (b) $\int 1/\sqrt{x}dx$ (c) $\int 3e^{-2x}\,dx$ (d) $\int(x-1)(x+2)dx$, (e) $\int(e^{3x}-e^{2x}+e^{x})dx$.

2. In the manufacture of a product, the marginal cost of producing x units is C'(x) and fixed costs are C(0). Find the total cost function C(x) when C'(x) = 3x + 4, C(0) = 40.

3. Compute the area bounded by the graph of the function over the indicated interval.

(a) $f(x) = 3x^2$ in [0,2], (b) $f(x) = 1/x^2$ in [1,10]

4. Evaluate the following integrals.

(a) $\int_1^2(2x+x^2)dx$, (b) $\int_{-2}^{3}(\frac{1}{2}x^2-\frac{1}{3}x^3)dx$

5. The profit of a firm as a function of its output x is given by f(x) = 4000 - x - 3000000/x, x>0. Find the level of output that maximizes profit.