

Section 14.2, problem 10:

$$\int \frac{7}{2x^{9/4}} dx = \int \frac{7}{2} x^{-9/4} dx = \frac{7}{2} \cdot \frac{x^{-5/4}}{-5/4} + C = -\frac{14}{5} x^{-5/4} + C.$$

Section 14.2, problem 50:

$$\int \frac{x^4 - 5x^2 + 2x}{5x^2} dx = \int \frac{1}{5} x^2 - 1 + \frac{2}{5} x^{-1} dx = \frac{1}{15} x^3 - x + \frac{2}{5} \ln|x| + C.$$

Section 14.3, problem 16:

The marginal cost function is $\frac{dc}{dq} = 0.000204q^2 - 0.046q + 6$ and the fixed costs are $FC = 15,000$.

(i) Integrate:

$$\int 0.000204q^2 - 0.046q + 6 dq = \frac{0.000204}{3} q^3 - \frac{0.046}{2} q^2 + 6q + K,$$

so the cost function has the form

$$c(q) = 0.000068q^3 - 0.023q^2 + 6q + K.$$

(ii) Solve for the constant of integration K :

$$FC = 15000 = c(0) = 0.000068 \cdot 0^3 - 0.023 \cdot 0^2 + 6 \cdot 0 + K = 0 + K \implies K = 15000,$$

so the cost function is

$$c(q) = 0.000068q^3 - 0.023q^2 + 6q + 15000.$$

(iii) Evaluate the cost of producing $q = 200$ units:

$$c(200) = 0.000068 \cdot 200^3 - 0.023 \cdot 200^2 + 6 \cdot 200 + 15000 = 15824.$$