Integration Tutorial Sheet 1

Question 1

Determine the following integrals:

a. $\int x^{10} dx$ **b.** $\int x^{\frac{1}{2}} dx$

c. $\int \frac{6}{x} dx$ **d.** $\int x^{-3} dx$

Question 2

Determine the following integrals of polynomials:

a. $I = \int \left(2x^3 - 5x^2 + 6x - 9\right) dx$

b. $I = \int \left(4x^3 - 6x^2 - 16x + 4\right) dx$

c. $I = \int \left(8x^3 + 6x^2 - 5x + 4\right) dx$

Question 3

Determine the area bounded by the curve $y = f(x)$, the x-axis and the stated ordinates in each of the following cases:

a. $y = x^2 - 3x + 4, \quad x = 0, \quad x = 4$

b. $y = 3x^2 + 5, \quad x = -2, \quad x = 3$

c. $y = -3x^2 + 6x + 5, \quad x = 0, \quad x = 2$

d. $y = -3x^2 + 12x + 10, \quad x = 1, \quad x = 4$