

1) Values of a function $W(t)$ are given in the following table.

t	2	2.5	3	3.5	4
$W(t)$	30	27	24	18	12

a) estimate $\int_2^4 W(t)dt$ from left and from right then average them

b) For your estimate in part (a), what is n ? what is Δt ?

2) Estimate the value of the definite integral $\int_1^4 \left(\frac{4}{x}\right)dx$ by using $n = 6$ and computing:

a) The left hand sum

b) The right hand sum

3) The marginal cost for a company is given by $C'(q) = 6q^2 - 24q + 200$ dollars/unit where q is the quantity produced. If $C(0) = 200$, find the total cost of producing 10 units

4) Find an antiderivative $F(x)$ with $F'(x) = 6x^2 - 4$ and $F(0) = 2$.

5) Evaluate the indefinite integrals of:

$$\text{a) } \int \left(3x^2 - \frac{2}{x^2} - 4x + 1 \right) dx$$

$$\text{b) } \int (8x^2 + 6e^{2x}) dx$$

$$\text{c) } \int (12e^{6x} - 6\sqrt{x}) dx$$

$$\text{d) } \int \left(1 + \frac{2}{x} - \frac{6}{\sqrt[3]{x^2}} \right) dx$$

6) Evaluate the definite integrals of:

$$\text{a) } \int_1^e \frac{4}{x} dx$$

$$\text{b) } \int_{-1}^1 (x^2 - x^4) dx$$

$$\text{c) } \int_0^1 (\sqrt{x} - x^2) dx$$

$$\text{d) } \int_{-1}^2 (-x^2 + x + 2) dx$$

7) Find the area between $y = 4 - x^2$ and the x -axis and sketch the region bounded by the graphs

8) Find the area between $y = 9 - x^2$ and $y = 2x + 1$ in $[-1, 3]$ and sketch the region bounded by the graphs

9) Find the area between $y = x^2 + 2x + 1$ and $y = 3x + 3$ and sketch the region bounded by the graphs

10) An object starts out from the origin and its velocity is given by: $v(t) = 2t^3 + 4t$. How far does it travel the first 3 hours?

11) What should A (*annuity*) per year be so that the amount of a continuous money flow over 20 years at interest rate 8%, compounded continuously, will be \$ 30,000?

12) A family makes an investment of \$5000 per year at an interest rate of 8% compounded continuously. Find the amount in 20 years.