

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

$t$	1	1.4	1.8	2.2	2.6	3
$W(t)$	25	28	35	45	50	60

a) Estimate  $\int_1^3 W(t)dt$  from left and from right then average them

Left sum:

Right sum:

b) For your estimate in part (a), what is  $n$ ? what is  $\Delta t$ ?

2) Estimate the value of the definite integral  $\int_1^3 \left(\frac{6}{x}\right)dx$  by using  $n = 4$  and computing:

$x$					
$f(x) = \frac{6}{x}$					

a) The left hand sum

b) The right hand sum

3) The marginal cost for a company is given by  $C'(q) = 3q^2 - 48q + 100$  dollars/unit where  $q$  is the quantity [4p] produced. If  $C(0) = 500$ , find the total cost of producing 10 units.

4) Suppose that the velocity of an object is given by  $v(t) = -t^2 + 8t + 10$ , where  $t$  is in seconds. Estimate the distance traveled by the object during the first 5 seconds (that is, between  $t = 0$  and  $t = 5$ ) using  $n = 5$

a) The left sum:

b) The right sum

5) Find an antiderivative  $F(x)$  with  $F'(x) = e^{2x}$  and  $F(0) = 4$ .

6) Evaluate the indefinite integrals of:

$$\text{a) } \int \left(x^3 + \frac{2}{x^3} - 8\right) dx$$

$$\text{b) } \int (\sqrt[3]{x} + 2) dx$$

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

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

7) Evaluate the definite integrals of:

$$\text{a) } \int_1^e \frac{6}{x} dx$$

$$\text{b) } \int_1^2 (6x^3 + 2) dx$$

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

$$\text{d) } \int_1^e \left(x - \frac{1}{x}\right) dx$$

8) Find the area between  $y = 4x$  and  $y = x^2 + 3$  and sketch the region bounded by the graphs

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9) Find the area between  $y = x^2 - 4x + 3$  and  $y = -x^2 + 2x + 3$  and sketch the region bounded by the graphs

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10) Find the area between  $y = x^2 - 2x$  and the  $x$ -axis in  $[0, 3]$  and sketch the region bounded by the graphs

11) The marginal revenue for the price of tickets is given by  $R' = 10q - 50$  dollars per ticket, where  $q$  is the number of tickets. Find the total revenue from the sale of tickets for the first 20 tickets.

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12) What should  $A$  (*annuity*) per year be so that the amount of a continuous money flow over 10 years at interest rate 5%, compounded continuously, will be \$ 20,000?

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13) Find the present value of an investment over 15 years period if there is a continuous money flow of \$1000 per year and the current interest rate is 8% compounded continuously