CALCULUS
WORKSHEET ON RIEMANN SUMS AND TRAPEZOIDAL RULE

1. A table of values for $f(t)$ is given.

t	0	20	40	60	80	100	120
$f(t)$	1.2	2.8	4.0	4.7	5.1	5.2	4.8

(a) Estimate $\int_0^{120} f(t)$ by using a left Riemann sum with six subintervals.

(b) Estimate $\int_0^{120} f(t)$ by using a right Riemann sum with six subintervals.

(c) Estimate $\int_0^{120} f(t)$ by using a midpoint sum with three subintervals.

(d) Estimate $\int_0^{120} f(t)$ by using the trapezoidal rule with three subintervals.

---

2. A table of values for $g(t)$ is given.

t	0	40	70	90	100
$g(t)$	150	180	195	184	172

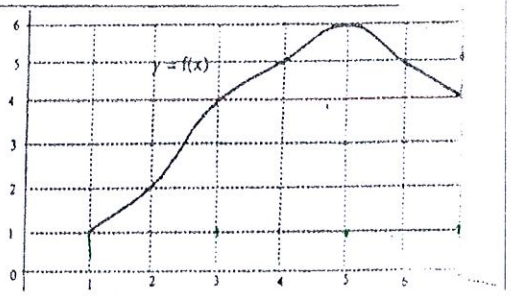
(a) Estimate $\int_0^{100} g(t)\,dt$ by using a left Riemann sum with four subintervals.

(b) Estimate $\int_0^{100} g(t)\,dt$ by using a right Riemann sum with four subintervals.

(c) Estimate $\int_0^{100} g(t)\,dt$ by using the trapezoidal rule with four subintervals.

---

3. The graph of the function f over the interval [1, 7] is shown. Using values from the graph, find trapezoidal rule estimates for the integral $\int_1^7 f(x)\,dx$ by using the indicated number of subintervals.
(a) n = 3
(b) n = 6



① a. $20(1.2) + 20(2.8) + 20(4) + 20(4.7) + 20(5.1) + 20(5.2) = 460$

b. $20(2.8) + 20(4) + 20(4.7) + 20(5.1) + 20(5.2) + 20(4.8) = 532$

c. $40(2.8) + 40(4.7) + 40(5.2) = 508$

d. $\frac{1}{2}(40)(1.2+4) + \frac{1}{2}(40)(4+5.1) + \frac{1}{2}(40)(5.1+4.8) = 484$

② a. $40(150) + 30(180) + 20(195) + 10(184) = 17,140$

b. $40(180) + 40(195) + 40(184) + 40(172) = 29,240$

c. $\frac{1}{2}(40)(150+180) + \frac{1}{2}(30)(180+195) + \frac{1}{2}(20)(195+184) + \frac{1}{2}(10)(184+172) = 17,795$

d. a. $\frac{1}{2}(2)(4+1) + \frac{1}{2}(2)(6+4) + \frac{1}{2}(2)(4+6) = 25$

b. $\frac{1}{2}(1)(1+2) + \frac{1}{2}(1)(2+4) + \frac{1}{2}(1)(4+5) + \frac{1}{2}(1)(5+6) + \frac{1}{2}(1)(6+5) + \frac{1}{2}(1)(5+4) = 24.5$