Section 3

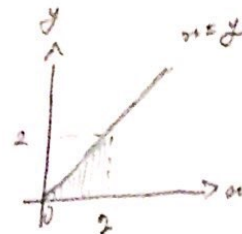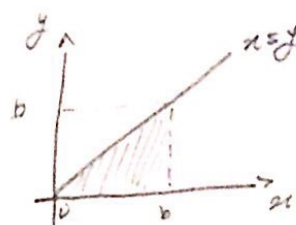Newton Leibniz Change - $\int_0^1 e^x \, dx$

Section 4 :

simple integrals 1 - $\int_1^4 2 \, dx = 6$

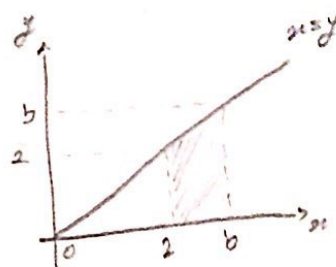$\int_{-1}^4 2 \, dx = 10$

simple integrals 2 - $\int_0^b x^0 \, dx = b$

Simple Integrals 3 - $\int_0^2 x \, dx = 2$

$\int_0^b x \, dx = \frac{1}{2} b^2$

$\int_2^b x \, dx = \frac{1}{2} b^2 - 2$

combining integrals - $\int_a^c f(x) \, dx = 70$

$\int_a^b f(x) \, dx + \int_b^c f(x) \, dx = \int_a^c f(x) \, dx$

$\int_a^b f(x) \, dx = 50$ (a, a)

$\int_b^c f(x) \, dx = 20$ (c, b)

Section 5

simple integrals 4 - $\int_{-3}^3 |x| \, dx = 9$

simple integrals 5 - $\int_{-3}^3 \sqrt{5 - x^2} \, dx = 4.5\pi$

$\int_0^3 \sqrt{9 - x^2} \, dx = 2.25\pi$

symmetry of definite Integrals - $\int_0^b f(x) \, dx = 12$

$c = \frac{1}{2}$

piecewise linear functions - $\int_0^3 f(x) \, dx = 5$
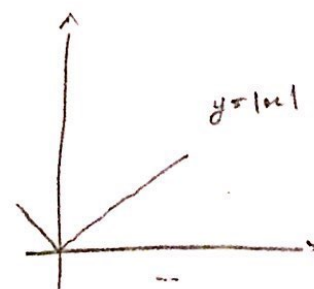
$S_{circle} = \pi r^2$
$= 9\pi$

Section 9

Evaluate the Sum 1 - $\sum\limits_{n=1}^{4} n^2 = 30$

Evaluate the Sum 2 - $\sum\limits_{d=0}^{4} 2^d = 31$

Evaluate the Sum 3 - $\sum\limits_{k=1}^{1001} (-1)^k = -1$

Evaluate the Sum 4 - $\sum\limits_{i=4}^{N} 10 + \sum\limits_{d=0}^{M} 6 = 10(N-3) + 6(M+1)$

Section 10

Evaluate the Sum - $\sum\limits_{i=1}^{n} \dfrac{i}{n^2(n+1)} = \dfrac{1}{2n}$

Section 13

computation of Riemann Sums 1 - $\int\limits_{0}^{1} x^3 \, dx = \begin{cases} 25/64 & \Delta x = \dfrac{b-a}{n} \quad b=1 \;\; a=0 \;\longrightarrow\; \Delta x = 1/4 \\[4pt] & \qquad\qquad n=4 \\[6pt] 9/64 & \left(\dfrac{1}{4}\right)^3 + \left(\dfrac{2}{4}\right)^3 + \left(\dfrac{3}{4}\right)^3 + \left(\dfrac{4}{4}\right)^3 = \dfrac{100}{64} \end{cases}$

computation of Riemann Sums 2 -

$1^2 + 2^2 + 3^2 + 4^2 =$

$1 + 4 + 9 + 16 = 30$

$1 + 2 + 4 + 8 + 16 = 31$

$\dfrac{n(n+1)}{2}$

$\overline{n^2(n+1)}$