INTEGRATION

2. UNIT.

LESSON (57) – HW:

Quest (1): Find the primitive functions, $F(x)$, of the following:-

(1) x^3 (2) x^8 (3) 5 (4) $2x$

(5) $12x^2$ (6) $5x^9$ (7) $\frac{x^4}{2}$ (8) $x^{3/2}$

(9) $\sqrt{x}$ (10) x^{-3} (11) $\frac{1}{x^2}$ (12) $\frac{6}{x^4}$

Quest (2): Find the primitive functions, $F(x)$, of the following.

(1) x^2+6 (2) x^3+6x (3) $4x^2-2x+5$

(4) $3x^5-6x^2+1$ (5) x^2-6x^3 (6) $2-6x-6x^5$

*(7) $5\sqrt{x}-\frac{1}{3x}$ *(8) $(x+3)^6$ **(9) $\frac{1}{(4x-1)^3}$

Quest (3): P. Wakenshaw – Textbook { Page 32 Part II Questions: (1), (3) and (5)

LESSON 58 – HW

Quest ① Find the following "indefinite Integrals":

(a) $\int x^2(5x-2)\,dx$ = (b) $\int (5x-4)^3\,dx$ = (c) $\int \sqrt{8-3x}\,dx$ =

Quest ② Evaluate the following "definite Integrals":-

(a) $\int_4^5 (2x+3)\,dx$ (b) $\int_0^3 (4x-2)\,dx$

(c) $\int_0^1 (y^3-y)\,dy$ (d) $\int_{-1}^3 (4+2x)\,dx$

(e) $\int_{-1}^1 (3t^3+1)\,dt$ (f) $\int_0^3 x(3-x)\,.dx$

Quest ③ (a) Find the x-intercepts of $y = 2x - x^2$ & sketch the curve
(b) Find the enclosed Area between this curve & the x-axis

LESSON (59) — HW

Quest① Find the Area represented by $A = \int_1^6 \sqrt{x+3}\, dx$

Quest② (i) Find the x-intercepts of $y = 4x - x^2$ and sketch the curve.

(ii) Find the area between this curve $y = 4x - x^2$ and the x-axis between the values $x = 0$ and $x = 6$

Quest③ (i) Find the points of intersection of the curves:-
$y = x^2 - 2x$ and $y = 6 - x$

(ii) Use this information to find the Area contained between the 2 curves.

LESSON (60) — HW

Quest ①: Find the area between the curve $y = \sqrt{x+5}$ and the y-axis !! from $y=1$ to $y=3$.

Quest ②: Find the volume of Revolution of the curve $y = 3x$, when rotated around the x-axis between the values of $x=0$ and $x=5$

Quest ③: Find the volume generated when the curve. $y = \sqrt{16-x^2}$ is rotated about the x-axis from $x=0$ to $x=2$.

LESSON (6d) – HW

Quest (1) Find the Volume generated when the curve $y = x^2 - 1$ is rotated about the y-axis between the points (1, 0) & (2, 3)

Quest (2) (a) Use one application of the Trapezoidal Rule to approximate the area under the curve $y = x^2 + x$ between the values $x = 0$ & $x = 2$.

(b) Find the exact area: $\int_0^2 (x^2 + x)\,dx$ & find the percentage error in part (a) of this question.

Quest (3): Use the Trapezoidal Rule with 5 equal strips (sub-intervals) to approximate the area under the curve $y = \frac{1}{\sqrt{1+x^2}}$ between $x = 0$ and $x = 1.0$

LESSON (62) — HW

Quest (1): Use the Trapezoidal Rule to find an approximation for the area under $y = x^2 + x$ from $x = 0$ to $x = 2$ using 4 strips (using 5 function values)

Quest (2) Find the exact area ~~under~~ for the above question by Evaluating $\int_0^2 x^2 + x \, dx$ and calculate the percentage error in question (1) result.

Quest (3) Use Simpsons Rule with 5 function values ~~to~~ approximate the area represented by $\int_0^2 (x^2 + x) dx$

Quest (4) Use Simpsons Rule with 7 function values To approximate $\int_1^4 f(x) \, dx$

x	1·0	1·5	2·0	2·5	3·0	3·5	4·0
f(x)	0	0·4	0·7	0·9	1·1	1·25	1·4