Q. No. 2 Part (i) (Page 1) Euler's Theorem:-

(a) $f(x,y) = 3x^3 + 7x^2y + xy^2 + 5y^3$

$f(x\lambda, y\lambda) = 3(x\lambda)^3 + 7(x\lambda)^2(y\lambda) + (x\lambda)(y\lambda)^2 + 5(y\lambda)^3$

$= 3x^3(\lambda^3) + 7x^2y(\lambda^3) + xy^2(\lambda^3) + 5y^3\lambda^3$

$= \lambda^3(3x^3 + 7x^2y + xy^2 + 5y^3)$

hence power of λ is degree of $f(x,y)$, i.e. **degree = 3**

(b) $$\boxed{(x)\frac{\partial}{\partial x}f(x,y) + (y)\frac{\partial}{\partial y}f(x,y) = n\,f(x,y)}$$

$\Rightarrow x\frac{\partial}{\partial x}f(x,y) = x\left\{\frac{\partial}{\partial x}(3x^3 + 7x^2y + xy^2 + 5y^3)\right\}$

$= x\{3(3x^2) + 7y(2x) + y^2(1) + 0\}$

$= x\{9x^2 + 14xy + y^2\}$

$= 9x^3 + 14x^2y + xy^2 \quad -①$

$\Rightarrow y\frac{\partial}{\partial y}f(x,y) = y\left\{\frac{\partial}{\partial y}(3x^3 + 7x^2y + xy^2 + 5y^3)\right\}$

$= y\{0 + 7x^2(1) + x(2y) + 5(3y^2)\}$

$= y\{7x^2 + 2xy + 15y^2\}$

$= 7x^2y + 2xy^2 + 15y^3 \quad -②$

$\Rightarrow$ adding $-①$ and $-②$

L.H.S = $9x^3 + 14x^2y + xy^2 + 7x^2y + 2xy^2 + 15y^3$

$= 9x^3 + 15y^3 + 3xy^2 + 21x^2y$

R.H.S $= 3(3x^3 + 7x^2y + xy^2 + 5y^3)$

$= 9x^3 + 21x^2y + 3xy^2 + 15y^3$

$= 9x^3 + 15y^3 + 3xy^2 + 21x^2y$

as L.H.S = R.H.S,

$$x\frac{\partial}{\partial x}f(x,y) + y\frac{\partial}{\partial y}f(x,y) = n\,f(x,y)$$ **proved.**

Q. No. 2 Part (i) (Page 2)

Q. No. 2 Part (ii) (Page 1) Continuity :-

→ as function is continuous at $x=1$,

$$f(x) = \lim_{x\to 1^+} f(x) = \lim_{x\to 1^-} f(x)$$

$$f(x) = R \cdot H \cdot L = L \cdot H \cdot L$$

→ evaluating $f(x)$ at $x=1$

$$f(x) = 2(K-1)x$$

$$f(1) = 2(K-1)(1)$$

$$f(1) = 2K-2 \quad -(1)$$

→ evaluating limit.

$$\lim_{x\to 1} f(x) = \lim_{x\to 1} \frac{3x^2-3}{x-1}$$

$$= \lim_{x\to 1} \frac{3(x^2-1)}{x-1}$$

$$= \lim_{x\to 1} \frac{3(x+1)\cancel{(x-1)}}{\cancel{(x-1)}}$$

$$= \lim_{x\to 1} 3(x+1)$$

$$= 3(1+1)$$

$$\lim_{x\to 1} f(x) = 6 \quad -(2)$$

→ equating -(1) and -(2) as per condition of continuity.

$$6 = 2K-2$$

$$6+2 = 2K$$

$$8 = 2K$$

$$4 = K$$

Thus the function is continuous at $x=1$, if

$$\boxed{K=4}$$

Q. No. 2 Part (ii) (Page 2)

Q. No. 2 Part (iii) (Page 1) Newton Ralphson :-

$f(x) = x^3 - 5x + 1$

$f'(x) = 3x^2 - 5$

$x_0 = 0.5$

1st iteration:

$x_{0+1} = \underset{(0.5)}{(x_0)} - \dfrac{f(x_0)}{f'(x_0)}$

$x_1 = 0.5 - \dfrac{(0.5)^3 - 5(0.5) + 1}{3(0.5)^2 - 5}$

$x_1 = 0.1071$

2nd iteration:

$x_{1+1} = (x_1) - \dfrac{f(x_1)}{f'(x_1)}$

$= 0.1071 - \dfrac{(0.1071)^3 - 5(0.1071) + 1}{3(0.1071)^2 - 5}$

$= 0.20089$

≈ 0.2009

$\boxed{x_2 = 0.2009}$

$f(x_2) = 3.6 \times 10^{-3}$

By second iteration the root = 0.2009.

Q. No. 2 Part (iii) (Page 2)

(Section B)

Q. No. 2 Part (iv) (Page 1) Position Vector:-

(a) velocity vector:-

$\vec{r}(t) = t^3\hat{i} + e^{-2t}\hat{j} + \sin 2t\,\hat{k}$ diff. b.s w.r.t t.

$\frac{d\vec{r}(t)}{dt} = \frac{d}{dt}\left(t^3\hat{i} + e^{-2t}\hat{j} + \sin 2t\,\hat{k}\right)$

$= \frac{d}{dt}(t^3)\hat{i} + \frac{d}{dt}(e^{-2t})\hat{j} + \frac{d}{dt}(\sin 2t)\hat{k}$

$\vec{v}(t) = 3t^2\hat{i} - 2e^{-2t}\hat{j} + 2\cos 2t\,\hat{k}$

(b) acceleration vector:-

$\frac{d}{dt}\vec{v}(t) = \cancel{3t^2}$ diff again b.s w.r.t t

$= \frac{d}{dt}(3t^2)\hat{i} - \frac{d}{dt}(2e^{-2t})\hat{j} + \frac{d}{dt}(2\cos 2t)\hat{k}$

$= 6t\hat{i} - 2(e^{-2t})(-2)\hat{j} + 2(-\sin 2t)(2)\hat{k}$

$= 6t\hat{i} + 4e^{-2t}\hat{j} - 4\sin 2t\,\hat{k}$

$= 6t\hat{i} + 4e^{-2t}\hat{j} - 4\sin 2t\,\hat{k}$

Q. No. 2 Part (iv) (Page 2)

Q. No. 2 Part (ix) (Page 1) FIRST PRINCIPLE:-

$$y = (2x+3)^{3/2}$$

$$y+\delta y = (2(x+\delta x)+3)^{3/2}$$

$$y+\delta y = (2x+2\delta x+3)^{3/2}$$

$$y+\delta y = (2x+3)^{3/2}\left\{1+\frac{2\delta x}{2x+3}\right\}^{3/2}$$

$$y+\delta y = (2x+3)^{3/2}\left\{\left(1+\left(\cancel{\tfrac{1}{1}}\right)\frac{2\delta x}{2x+3}\right)^{3/2}\right\}$$

$$\delta y = (2x+3)^{3/2}\left\{\left(1+\frac{2\delta x}{2x+3}\right)^{3/2}\right\} - (2x+3)^{3/2}$$

$$\delta y = (2x+3)^{3/2}\left\{\left(1+\left(\frac{3}{2}\right)\left(\frac{2\delta x}{2x+3}\right)+\frac{(3/2)(3/2-1)}{2!}\left(\frac{2\delta x}{2x+3}\right)^2 + \cdots\right)-\right.$$

$$\delta y = (2x+3)^{3/2}\left\{\cancel{1}+\frac{3\delta x}{2x+3}+\frac{3}{8}\left(\frac{4\delta^2 x}{(2x+3)^2}\right)+\cdots-\cancel{1}\right\}$$

$$\delta y = (2x+3)^{3/2}\left\{\frac{3\delta x}{(2x+3)}+\frac{3}{2}\left(\frac{\delta^2 x}{(2x+3)^2}\right)+\cdots\right\}$$

$$\frac{\delta y}{\delta x} = \frac{(2x+3)^{3/2}}{\delta x}\left\{\frac{3\delta x}{(2x+3)}+\frac{3}{2}\left(\frac{\delta^2 x}{(2x+3)^2}\right)+\cdots\right\}$$

$$\frac{\delta y}{\delta x} = (2x+3)^{3/2}\left\{\frac{3}{(2x+3)}+\frac{3}{2}\frac{(\delta x)}{(2x+3)^2}+\cdots\right\}$$

applying limit,

$$\lim_{\delta x\to 0}\frac{\delta y}{\delta x} = \lim_{\delta x\to 0}(2x+3)^{3/2}\left\{\frac{3}{(2x+3)}+\frac{3}{2}\frac{(\delta x)}{(2x+3)^2}\right\}$$

$$= (2x+3)^{3/2}\left\{\frac{3}{2x+3}+\frac{3}{2}\frac{\times 0}{(2x+3)^2}\right\}$$

$$= (2x+3)^{3/2}\frac{3}{(2x+3)}$$

$$= (2x+3)^{1/2}(3)$$

$$= 3\sqrt{2x+3}$$

Q. No. 2 Part (ix) (Page 2)

Q. No. 2 Part (v) (Page 1) Integration :-

$= \int (3t+1)(t-1) \, dt$

$= \int (3t^2 - 3t + t - 1) \, dt$

$= \int (3t^2 - 2t - 1) \, dt$

$= \int 3t^2 \, dt - \int 2t \, dt - \int dt$

$= 3\int t^2 dt - 2\int t dt - \int dt$

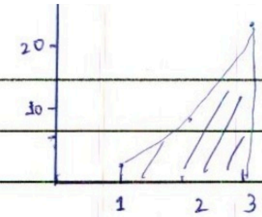
$= \frac{3t^3}{3} - \frac{2t^2}{2} - t + C$

$= t^3 - t^2 - t + C$

$= t^3 - t^2 - t + C$

Q. No. 2 Part (v) (Page 2)

Q. No. 2 Part (vi) (Page 1) AREA:-



$= 3x^2 - 2x$

area $= \int_1^3 3x^2 - 2x \, dx$

y	1	8	21
x	1	2	3

$= \int_1^3 3x^2 \, dx - \int_1^3 2x \, dx$

$= \cancel{3}\frac{(x^3)}{\cancel{3}} \Big|_1^3 - \cancel{2}\left(\frac{x^2}{\cancel{2}}\right) \Big|_1^3$

$= (x^3 - x^2) \Big|_1^3$

$= (3^3 - 3^2) - (1^3 - 1^2)$

$= 18 - (0)$

$= 18$ units.

= 18 units

Q. No. 2 Part (vi) (Page 2)

Q. No. 2 Part (vii) (Page 1) Straight lines:-

(a) $= 3x^2 - 2xy - 8y^2$ $\quad -24 = 6x-4$ $\quad -2 = -6+4$

$= 3x^2 - 6xy + 4xy - 8y^2$

$= 3x(x-2y) + 4y(x-2y)$

$= (3x+4y)(x-2y)$

The straight lines are ① $3x+4y=0$

② $x-2y=0$

(b) $m1 = \frac{-a}{b} = -\frac{3}{4}$

$m_2 = \frac{-a}{b} = \frac{-1}{-2} = \frac{1}{2}$

$\tan\theta = \frac{m_2 - m_1}{1 + m_1 m_2}$

$= \frac{(1/2) - (-3/4)}{1 + (1/2)(-3/4)}$

$\tan\theta = 2$

$\theta = 63.43494$

$\theta = 63.43494^\circ$

Q. No. 2 Part (vii) (Page 2)

Q. No. 2 Part (viii) (Page 1) Area :-

A(5,4) B(2,1) C(7,3)

$$\text{Area} = 1/2 \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$$

$$= 1/2 \begin{vmatrix} 5 & 4 & 1 \\ 2 & 1 & 1 \\ 7 & 3 & 1 \end{vmatrix}$$

$$= \frac{1}{2} \left\{ 5(1-3) - 4(2-7) + 1(6-7) \right\}$$

$$= \frac{1}{2}(9)$$

$$= \frac{9}{2} \text{ units} \quad = 4.5 \text{ units.}$$

Q. No. 2 Part (viii) (Page 2)

Q. No. 2 Part (x) (Page 1) Integration :-

$= \int \frac{e^x \, dx}{e^{2x}+1}$

let $e^x = \tan\theta$

$e^x dx = \sec^2\theta \, d\theta$

~~let $u = e^{2x}+1$~~

~~$u = e^{2x}+1$~~

~~$du = 2e^{2x}dx$~~

~~$\frac{du}{} = e$~~

hence, $= \int \frac{\cancel{\tan\theta} \sec^2\theta \, d\theta}{(\tan^2\theta)+1}$

$= \int \frac{\sec^2\theta \, d\theta}{\sec^2\theta}$

$= \int d\theta$

$= \theta$ as $e^x = \tan\theta$

$\boxed{= \tan^{-1} e^x + C}$ $\tan^{-1} e^x = \theta$

$= \tan^{-1} e^x + C$

(Section B)

Q. No. 2 Part (x) (Page 2)

Q. No. 2 Part (xi) (Page 1) Partial Differentiation:-

$f(x,y) = \sqrt{x^3+y^3}$

(a) $\frac{\partial f}{\partial x} = \frac{\partial}{\partial x}\sqrt{x^3+y^3}$

$= \frac{1}{2\sqrt{x^3+y^3}}\left(\frac{\partial}{\partial x}x^3 + \frac{\partial}{\partial x}y^3\right)$

$= \frac{1}{2\sqrt{x^3+y^3}}\left(3x^2 + 0\right)$

$= \frac{3x^2}{2\sqrt{x^3+y^3}}$

$= \frac{3x^2}{2\sqrt{x^3+y^3}}$

(b) $\frac{\partial f}{\partial y} = \frac{\partial}{\partial y}\sqrt{x^3+y^3}$

$= \frac{1}{2\sqrt{x^3+y^3}}\left(\frac{\partial}{\partial x}x^3 + \frac{\partial}{\partial y}y^3\right)$

$= \frac{1}{2\sqrt{x^3+y^3}}\left(0+3y^2\right)$

$= \frac{3y^2}{2\sqrt{x^3+y^3}}$

Q. No. 2 Part (xi) (Page 2)

Q. No. 2 Part (xii) (Page 1) $\frac{dy}{dx}$ calculation:-

$$x^3 + 3x^2y^2 + y^3 = 0$$

$$\frac{d}{dx}(x^3 + 3x^2y^2 + y^3) = \frac{d}{dx}(0)$$

$$\frac{d}{dx}(x^3) + \frac{d}{dx}(3x^2y^2) + \frac{d}{dx}(y^3) = 0$$

$$3x^2 + 3\left\{x^2(2y)\frac{dy}{dx} + y^2(2x)\right\} + 3y^2\frac{dy}{dx} = 0$$

$$3x^2 + 6x^2y\frac{dy}{dx} + 6xy^2 + 3y^2\frac{dy}{dx} = 0$$

$$3x^2 + 6xy^2 = \frac{dy}{dx}(-6x^2y - 3y^2)$$

$$\frac{3x^2 + 6xy^2}{-6x^2y - 3y^2} = \frac{dy}{dx}$$

$$\frac{x^2 + 2xy^2}{-2x^2y - y^2} = \frac{dy}{dx}$$

Q. No. 2 Part (xii) (Page 2)

Q. No. 3 (Page 1) equations:-

(a) $\frac{x^3}{8} + \frac{x^2}{4} + \frac{2}{x^2} + \frac{1}{2}$

(a) tangent equation at $x=2$

$$y = \frac{x^3}{8} + \frac{x^2}{4} + \frac{2}{x^2} + \frac{1}{2}$$

$$\frac{dy}{dx} = \frac{1}{8}(3x^2) + \frac{1}{4}(2x) + 0 + 2(-2)x^{-2-1}$$

$$\frac{dy}{dx} = \frac{3x^2}{8} + \frac{x}{2} - \frac{4}{x^3}$$

put $x=2$ for m.

$$m = \frac{3(2)^2}{8} + \frac{2}{2} - \frac{4}{(2)^3}$$

$$m = 2$$

if $\boxed{x=2}$, $y = \frac{2^3}{8} + \frac{2^2}{4} + \frac{2}{2^2} + \frac{1}{2}$

$$\boxed{y=3}$$

equation of tangents

~~$y = mx$~~

$$\cancel{(y-2) = 2(x-3)}$$
$$\cancel{y-2 = 2x-6}$$
$$\cancel{y-2x = 2-6}$$
$$\cancel{y-2x = -4}$$
$$\cancel{y-2x+4 = 0}$$
$$\cancel{-2x+y+4=0}$$
$$\cancel{2x-y-4=0}$$

$$(y-3) = 2(x-2)$$
$$y-3 = 2x-4$$
$$y-2x = 3-4$$
$$y-2x = -1$$
$$y-2x+1 = 0.$$
$$2x-y-1=0$$

Q. No. 3 (Page 2)

(b) equation of normal:

$$(y-3) = -\frac{1}{m}(x-2)$$

$$(y-3) = -\frac{1}{2}(x-2)$$

$$2y-6 = -x+2$$

$$2y+x = 6+2$$

$$2y+x = 8$$

$$x+2y-8=0.$$

$$\boldsymbol{x+2y-8=0}$$

(c) Continuity :-

for a function to be continuous at $x=0$,

① $f(0)$ must be defined

② limit must exist

③ $R \cdot H \cdot L = L \cdot H \cdot L = f(c)$

thus checking continuity at $x=0$.

$$= \frac{x^3}{8} + \frac{x^2}{4} + \frac{2}{x^2} + \frac{1}{2}$$

$$= \frac{0}{8} + \frac{0}{4} + \frac{2}{0} + \frac{1}{2}$$

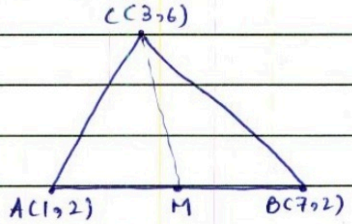
$$= 0 + 0 + \frac{1}{2} + \infty$$

as function is undefined at $x=0$, function is discontinuous at $x=0$.

Q. No. 3 (Page 3)

Q. No. 3 (Page 4)

Q. No. 4 (Page 1) ΔABC:-



(a) Median $\overline{CM}$

$$M = \left(\frac{1+7}{2}, \frac{2+2}{2}\right)$$

$$= (4, 2)$$

Now finding median,

$(x_1, y_1) = (3,6)$

$(x_2, y_2) = (4,2)$

$$\frac{(y-y_1)}{(y_2-y_1)} = \frac{(x-x_1)}{(x_2-x_1)}$$

$$\frac{(y-6)}{2-6} = \frac{(x-3)}{4-3}$$

$$\frac{(y-6)}{-4} = \frac{(x-3)}{1}$$

$$(y-6) = -4(x-3)$$

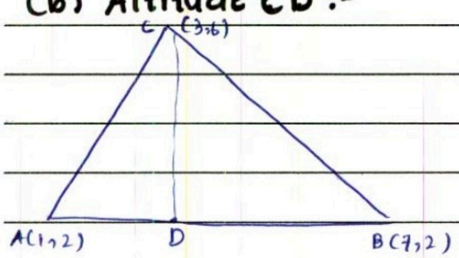
$$y-6 = -4x+12$$

$$y+4x = 12+6$$

$$\mathbf{y+4x = 18}$$

$$4x+y-18 = 0$$

(b) Altitude CD :-



$(x_1, y_1) = (3,6)$

slope of $AB = \frac{2-2}{7-1} = 0$

slope of $CD = \frac{-1}{\text{slope of } AB}$

$$= \frac{-1}{0}$$

$$(y-y_1) = m(x-x_1)$$

$$y-6 = \frac{-1}{0}(x-3)$$

$$(y-6)(0) = -(x-3)$$

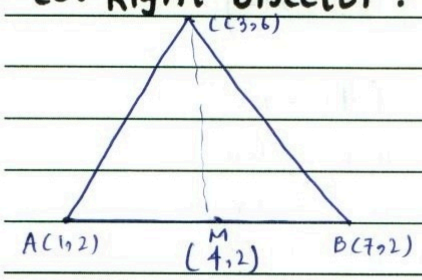
$$(y-6)(0) = 3-x$$

$$0 = 3-x$$

$$\mathbf{x-3=0}$$

Q. No. 4 (Page 2)

(c) Right bisector :-



$(x_1, y_1) = (4, 2)$

slope of $\overline{AB} = \dfrac{2-2}{7-1} = 0$

slope of $\overline{CM} = \dfrac{-1}{0}$

$(y - y_1) = (m)(x - x_1)$

$(y - 2) = \dfrac{-1}{0}(x - 4)$

$\cancel{0(y-2) = -x+4}$ $\qquad 0 = -(x-4)$

$\cancel{y + x = 2+4}$ $\qquad 0 = -x+4$

$\cancel{y + x = 6}$ $\qquad 0 = -x+4$

$x - 4 = 0$

$$\mathbf{x - 4 = 0}$$

Q. No. 4 (Page 3)

Q. No. 4 (Page 4)

Q. No. 5 (Page 1) $\int \frac{2x-1}{x^3-x^2-2x} dx$

$= x^3 - x^2 - 2x$

$= x^3 - 2x^2 + x^2 - 2x$

$= x^2(x-2) + x(x-2)$

$= (x^2+x)(x+2)$

$= x(x+1)(x-2)$

$= \int \frac{2x-1}{x(x+1)(x-2)} dx$

by partial fractions,

$$\frac{2x-1}{x(x+1)(x-2)} = \frac{A}{x} + \frac{B}{x+1} + \frac{C}{x-2}$$

$2x-1 = A(x+1)(x-2) + B(x)(x-2) + C(x)(x+1)$

$2x-1 = A(x^2-2x+x-2) + B(x^2-2x) + C(x^2+x)$

$2x-1 = Ax^2 - 2Ax + Ax - 2A + Bx^2 - 2Bx + Cx^2 + Cx$

$2x-1 = x^2(A+B+C) + x(A-2A-2B+C) - 2A$

put $x=2$

$2(2)-1 = A(x+1)(-2+2) + B(2)(2-2) + C(2)(2+1)$

$4-1 = C(6)$

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

put $x=-1$

$2(-1)-1 = A(-1+1)(-1-2) + B(-1)(-1-2) + C(-1)(-1+1)$

$-3 = B(3)$

$-1 = B$

put $x=0$

$2(0)-1 = A(0+1)(0-2) + B(0) + C(0)$

$-1 = -2A$

$1/2 = A$

$C = 1/2$, $A = 1/2$, $B = -1$

Q. No. 5 (Page 2)

$$\int \frac{2x-1}{x^3-x^2-2x}\,dx = \int \frac{A\,dx}{x} + \int \frac{B\,dx}{x+1} + \int \frac{C\,dx}{x-2}$$

$$= \int \frac{1/2}{x}\,dx + \int \frac{(-1)\,dx}{x+1} + \int \frac{\frac{1}{2}}{x-2}\,dx$$

$$= \frac{1}{2}\int \frac{dx}{x} - \int \frac{dx}{x+1} + \frac{1}{2}\int \frac{dx}{x-2}$$

$$= \frac{1}{2} \ln x - \frac{1}{}\ln(x+1) + \frac{1}{2}\ln(x-2) + C$$

$$= \frac{1}{2} \ln x - \frac{1}{}\ln(x+1) + \frac{1}{2}\ln(x-2) + C$$

$$= \frac{1}{2} \ln x - \ln(x+1) + \frac{1}{2}\ln(x-2) + C$$

Q. No. 5 (Page 3)

Q. No. 5 (Page 4)

Q. No. 6 (Page 1) SIMPSON'S RULE:-

$$\int_0^2 (3x^2-2x)\,dx$$

$h = \frac{b-a}{2n} = \frac{2-0}{2(2)} = \frac{2}{4} = \frac{1}{2}$

$\frac{h}{3}\{f(x_0)+f(x_4)+4(f(x_1)+f(x_3)+2(f(x_2)\}$

f(x)	0	-1/4	1	3.75	8
(x)	0	1/2	1	3/2	2
	(x_0)	(x_1)	(x_2)	(x_3)	(x_4)

$= \cancel{\frac{1/2}{3}}\{0+8+4(\cancel{1.25}+\cancel{1.5})+2(\cancel{3.75})\}$

$\cancel{= \frac{1}{6}\{8+3+\frac{15}{2}\}}$

$\cancel{= \frac{12}{6}}$

$\cancel{= 2}$

$= \frac{1}{6}\{0+8+4(-0.25+3.75)+2(1)\}$

$= \frac{1}{6}\{8+14+2\}$

$= \frac{24}{6}$

$= 4$

(a) $\int_0^2 (3x^2-2x)\,dx$ **by Simpsons = 4**

(b) Actual integral:-

$= \int_0^2 (3x^2-2x)\,dx$

$= \frac{\cancel{3}x^3}{\cancel{3}} - \frac{\cancel{2}x^2}{\cancel{2}}\Big|_0^2$

$= (x^3-x^2)\Big|_0^2$

$= (2^3-2^2)-(0^3-0^2)$

= 4 units

Q. No. 6 (Page 2)

(c) Difference:-

= Actual value - estimated value

= 4 - 4

= 0.

which means 100% accurate results.

Q. No. 6 (Page 3)

Q. No. 6 (Page 4)

$= x^3 - 2x^2 + x^2 - 2x$

$= x^2(x-2) + x(x-2)$

$= (x^2+x)(x-2)$

$= x(x+1)(x-2)$

$y = (2x+3)^{3/2}$ $\qquad \frac{3}{2}(2x+3)(2)$

$y + \delta y = (2x + 2\delta x + 3)^{3/2} - (2x+3)^{3/2}$

$= (2x+3)^{3/2}\left\{1 + \frac{2\delta x}{2x+3}\right)^{3/2} - (2x+3)^{3/2}$

$\frac{2x-1}{''} = \frac{A}{x} + \frac{B}{x+1} + \frac{C}{x-2}$ $\qquad = (2x+3)^{3/2}\left\{\left(1 + \frac{2\delta x}{2x+3}\right)^{3/2} - 1\right\}$

$(2x-1) = A(x+1)(x-2) + B(x)(x-2)$
$+ C(x)(x+1)$ $\qquad = (2x+3)^{3/2}\left\{1 + \frac{3}{2}\left(\frac{2\delta x}{2x+3}\right)\right)$

put $x=-1$

$\frac{3}{\cancel{2}}(2x+3)^{3/2-1}(\cancel{2})$

$-3 = B(-1)(-1-2)$

$3(2x+3)^{1/2}$

$-3 = 3B$

$-1 = B$

put $x=0$

put $x=2$

$2(0)-1 = A(0+1)(0-2)$

$2(2)-1 = C(2)(2+1)$

$-1 = A(-2)$

$C = 1/2$

$1/2 = A$

$\frac{1}{2}C$

$\frac{1}{\cancel{2}}x^2 - \frac{1}{2}(2\cancel{x}) + \frac{x}{\cancel{2}} - 2\left(\frac{1}{2}\right) + B\left(\frac{1}{2}\right.$

$+ (-1)(\cancel{x}^2) - 2(\cancel{x}x-1)$

$+ \frac{1}{\cancel{2}}x^2 + \frac{1}{\cancel{2}}x$

$2 - \frac{x/2}{2} = 0 + 2x - 1$

$(1+\frac{2}{x})^2$

$e^x + 2(e^{-2x})(-2)$

$= e^x - 4e^{-2x}$

$\frac{3}{2}(\frac{1}{2})x^{1/2-1} - 2$

$= \frac{3}{4}x^{-1/2} - 2$

$= \frac{3}{4}$

$\frac{3}{2}(\frac{1}{2})x^{-1/2} - 2$

$= \frac{3}{4}x$

$2\int x\,dx$

$= 2\frac{x^2}{2}\Big|_0^2$

$(1+0)\hat{i} + \sin 0\hat{j} + \cos 2\times 0\hat{k}$

$= \hat{i} + 0\hat{j} + \hat{k}$

$= \hat{i} + 1\hat{k}$

$x^2 - x^2$

$4 - 0^2 =$

$4+2 =$

$\frac{6}{3} = k$

$2 =$

$\frac{1}{8}\{8\cos 2x(2)\}$

$= \frac{2}{8}(\cos 2x)$

$2\hat{i} - 2\hat{j}$

$\int \frac{\cos x\,dx}{\sin x}$

$\ln|\sin x| + c$

$f''(x) = \frac{2}{8}(-\sin 2x)(2)$

$= \frac{4}{8}(-\sin 2x)$

$\left(\frac{5+(-2)+0}{3}\right), \left(\frac{-5+0+2}{2}\right)$

$f'''(x) = \frac{1}{2}(-\cos 2x)(2)$

$= -\cos 2x$

$(x+1)^2 + (y+1)^2 = 4 \quad (1, -1)$

$4ax = 8x$

$a = 8/4$

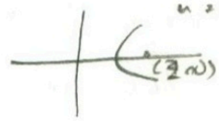
$a = 2$

$2gx = 4x \quad 2fy = 4y$

$g = 2 \quad f = 2$

$\sqrt{2^2+2^2-c}$

$\sqrt{4+4}$



$f''''(x) = -(-\sin 2x)(2)$

$= 2\sin 2x$

$2, 1$

$\frac{1}{x}\frac{dy}{dx} = 2$

$dy = 2x\,dx$

$y = \frac{2x^2}{2} + c$

$y = x^2 + c$

$e^{x+y}(0+1)$

$= e^{1+0}$

$= e^1$

$2x = 2(1)$

$\frac{2x^2}{2}$

x^2

$4 - 0^2 = 3k - 2$

$6 = 3k$

$\frac{2-0}{2} = \frac{2}{2} = 1$

$\frac{2-0}{4} = 1/2$

$3x^2 - 2$

$= 3(0)^2 - 2$

$= -2$

0	0.5	1	1.5	2
1	5/4	2	13/4	5

0	1	2
1	2	5

$\frac{1}{2}\{1+5+2(2)\}$

$\frac{1}{2}\{6+4$

$\frac{1}{2} \div \frac{2}{1}$

1

0	0.5	1	1.5	2
1	5/4	2	13/4	5

$2x + 0$

$= 2(1)$

$\frac{1}{4}\{1+8+4$

$\frac{x^3}{3} + x$

$\begin{vmatrix} 1 & 0 & -4 \\ 1 & 0 & -3 \\ 4 & 1 & -18 \end{vmatrix}$

$3x^2 - 2$

$e^{x+y}(1+0)$

$e^{x+y}(1)$

e^{1+0}

$1(\cancel{-1+0+3})$

$4(1-0)$