MATH ZONE FOR VU



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FINALTERM MCQS by Iqra azhar

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Question No: 1 (Marks: 1) - Please choose one

Let $f(x)$ is a function such that as x approaches a real number a, either from left or right-hand-side, the function values increases or decreases unboundedly then

$\lim_{x \to a} f(x)$

- Exist
- Does not exist

Question No: 2 (Marks: 1) - Please choose one

$\frac{d(\sec x)}{dx} =$

- $(\sec x)(\tan x)$
- $(\sec x)(\tan x)$
- $(co\sec x)(co\,t\,x)$
- $(co\sec x)(\tan x)$

Question No: 3 (Marks: 1) - Please choose one

Consider a function $h(x)$ and a constant c then

$\frac{d}{dx}\left((c)\{h(x)\}\right)$ = _____

- 0
- $\frac{d}{dx}\left(h(x)\right)$
- $\frac{d}{dx}\left(h(cx)\right)$
- $c\frac{d}{dx}\left(h(x)\right)$

Question No: 4 (Marks: 1) - Please choose one

If f is continuous function such that $\lim_{x\to-\infty} f(x) = +\infty$ and $\lim_{x\to+\infty} f(x) = +\infty$ then f has_____on $(-\infty,+\infty)$

- maximum value but no minimum
- minimum value but no maximum
- both maximum and minimum value

Question No: 5 (Marks: 1) - Please choose one

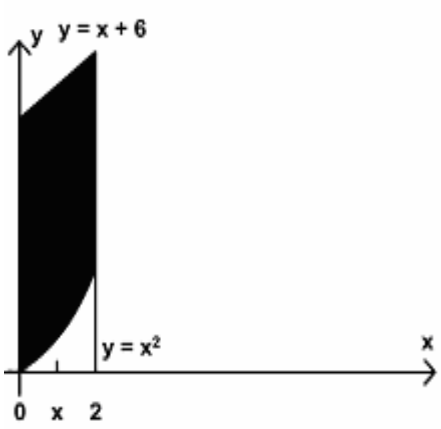
Sigma notation is represented by which of the following Greek letter?

- χ
- η
- Σ
- ψ

Question No: 6 (Marks: 1) - Please choose one

In the following figure, the area enclosed is bounded below by :

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- $y = x + 6$
- $y = x^2$
- $x = 2$
- $x = 0$

Question No: 7 (Marks: 1) - Please choose one

At what points the two curves: $y = x^2 \text{ and } y = x + 6$ intersect ?

- $x = 0 \text{ and } x = 2$
- $x = 0 \text{ and } x = 3$
- $x = 2 \text{ and } x = 3$
- $x = -2 \text{ and } x = 3$

Question No: 8 (Marks: 1) - Please choose one

Let the solid generated by the region enclosed between $y = \sqrt{x}$; $x = 1, x = 4$ and the x-axis is revolved about the y-axis. Which of the following equation gives the volumes of a solid by cylindrical shells?

- $V = \int_1^4 2\pi x\sqrt{x}dx$

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$$V = \int_{1}^{4} 2x\sqrt{x}dx$$

►

$$V = \int_{0}^{4} 2x\sqrt{x}dx$$

►

$$V = \int_{4}^{4} 2x\sqrt{x}dx$$

►

Question No: 9 (Marks: 1) - Please choose one

Let f is a smooth curve on the interval [a, b]. What is the arc length L of the curve f(x) defined over the interval [a, b]?

$$L = \lim_{\max \Delta x \to 0} \sum_{k=1}^{n} \sqrt{1 + (f'(x^*_k))}$$

►

$$L = \sum_{k=1}^{n} \sqrt{1 + (f'(x^*_k))}\Delta x_k$$

►

$$L = \lim_{\max \Delta x \to 0} \sum_{k=1}^{n} \sqrt{1 + (f'(x^*_k))^2}\Delta x_k$$

►

$$L = \sum_{k=1}^{n} \sqrt{1 + (f(x^*_k))}\Delta x$$

►

Question No: 10 (Marks: 1) - Please choose one

For a graph to be symmetric about y-axis means, for each point (x,y) on the graph,the point ----------is also on the graph

► (x , -y)
► (-x , y)

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► (-x , -y)

Question No: 11 (Marks: 1) - Please choose one

The graph $x = y^2$ is symmetric about---------- axis

► X-axis
► Y-axis
► Origin

Question No: 12 (Marks: 1) - Please choose one

If a quantity y depends on another quantity x in such a way that each value of x determines exactly one value of y , we say that y is……of x

► relation
► function
► not a function
► not a relation

Question No: 13 (Marks: 1) - Please choose one

Domain of the function $y = \frac{(x^2 - 4)}{(x - 2)}$ is

► $(-\infty, 2) U (2, +\infty)$
► $(-\infty, 2)$
► $(-\infty, 0)$

Question No: 14 (Marks: 1) - Please choose one

Tan(x) is continuous every where except at points

► $\pm \frac{k\pi}{2} (k = 1,3,5,...)$
► $\pm \frac{k\pi}{2} (k = 2,4,6,...)$

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$\pm \frac{k\pi}{2} (k = 1, 2, 3, 4, 5, 6, ...)$

▶

Question No: 15 (Marks: 1) - Please choose one

$\lim_{x \to 0} \frac{\sin x}{x}$ = _____

▶ -1
▶ 2
▶ 0
▶ 1

Question No: 16 (Marks: 1) - Please choose one

How the series $1 - 3 + 5 - 7 + 9 - 11$ can be expressed in sigma notation?

$\sum_{k=0}^{k=5} (-1)^k (2k + 1)$

▶

$\sum_{k=1}^{k=5} (-1)^k (2k + 1)$

▶

$\sum_{k=1}^{k=5} (2k + 1)$

▶

$\sum_{k=1}^{k=5} (2k + 1)$

▶

Question No: 17 (Marks: 1) - Please choose one

Let the region bounded by the curve $y = \sqrt[3]{x}$, the x-axis, and the line $x = 3$ is revolved about the y-axis to generate a solid. Which of the following equation gives the volume of a solid by cylindrical shells?

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$$V = \int_0^3 x^{\frac{3}{2}}\, dx$$

▶

$$V = 2\pi \int_0^3 \sqrt{x}\, dx$$

▶

$$V = \int_0^3 2\pi x \sqrt[3]{x}\, dx$$

▶

$$V = \int_0^3 x \sqrt[3]{x}\, dx$$

▶

Question No: 18 (Marks: 1) - Please choose one

$$y = \frac{2\sqrt{2}}{3} x^{\frac{3}{2}};\ 0 \le x \le 2$$

Let then which of the following is the length of the curve?

$$L = \int_0^2 \sqrt{1 + \left[\frac{d}{dx}\left(\frac{2\sqrt{2}}{3} x^{\frac{3}{2}}\right)\right]^2}\, dx$$

▶

$$L = \int \sqrt{1 + \left[\frac{d}{dx}\left(\frac{2\sqrt{2}}{3} x^{\frac{3}{2}}\right)\right]^2}\, dx$$

▶

$$L = \int_0^2 \sqrt{1 + \left[\frac{d}{dx}\left(\frac{2\sqrt{2}}{3} x^{\frac{3}{2}}\right)\right]^2}\, dx$$

▶

$$L = \int_0^2 \sqrt{1 + \left[\frac{d}{dx}\left(\frac{2\sqrt{2}}{3} x^{\frac{3}{2}}\right)\right]}\, dx$$

▶

Question No: 19 (Marks: 1) - Please choose one

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$\frac{2}{3}$

is known as

- An even number
- Irrational Number
- A natural Number
- Rational Number

Question No: 20 (Marks: 1) - Please choose one

For a function *f*, let $f'(x_n) = 0 \quad for\ some\ n$.

Does the Newton's Method works for approximating the solution of $f(x) = 0$?

- Yes
- No

Question No: 21 (Marks: 1) - Please choose one

The Mean Value Theorem states that "Let function *f* be differentiable on (a,b) and continuous on [a, b], then there exist at least one point c in (a,b) where……. "

- $f'(c) = \frac{f(b) - f(a)}{b - a}$
- $f(c) = \frac{f(b) - f(a)}{b - a}$
- $f(c) = \frac{f(a) - f(b)}{b - a}$
- $f'(c) = \frac{f(a) - f(b)}{b - a}$

Question No: 22 (Marks: 1) - Please choose one

If there is some function *F* such that

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$\frac{d}{dx}[F(x)] = f(x)$

the
n
any
fun
ctio
n of

the form $F(x) + C$ is---------- of $f(x)$

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- Derivative
- Antiderivative
- Slope
- Maximum value

Question No: 23 (Marks: 1) - Please choose one

If *f* and *g* are continues function on an interval [a, b]
and $f(x) \geq g(x) \quad for \quad a \leq x \leq b$, then area is bounded by the lines parallel to:

- X -axis
- Y-axis
- Both X -axis and Y-axis

Question No: 24 (Marks: 1) - Please choose one

What is the sum of following series?

$1^3 + 2^3 + 3^3 + 4^3 + _____ + n^3$

- $\frac{n(2n)(2n+1)}{6}$
- $\frac{(n+1)(n+2)}{2}$
- $\left[\frac{n(n+2)}{2}\right]^2$
- $\left[\frac{n(n+1)}{2}\right]^2$

Question No: 25 (Marks: 1) - Please choose one

$\frac{5}{7} \times 1 + \frac{5^2}{7} \times 2 + \frac{5^2}{7} \times 3 + \frac{5^2}{7} \times 4 \ldots + \frac{5^2}{7} \times n = _____$

- $\frac{5n(n+1)(2n+1)}{42}$

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$\frac{5n(n+1)}{14}$

► $\frac{5n^2(n+1)^2}{14}$

► $\frac{5(n+1)(2n+1)}{42}$

►

Question No: 26 (Marks: 1) - Please choose one

$\int_a^a f(x)dx$ = _____

If point a is in the domain of function f, then

► $f'(x)$

► $f(x)$

► 0

► 1

Question No: 27 (Marks: 1) - Please choose one

If $a_1 > a_2 > a_3 > ..... > a_n > ....$, then a sequence $\{a_n\}$ is .....

► Increasing

► Nondecreasing

► Decreasing

► Nonincreasing

Question No: 28 (Marks: 1) - Please choose one

For a sequence $\{a_n\}$ if the difference between successive terms $a_{n+1} - a_n \leq 0$ then the sequence is known as:

► Increasing

► Decreasing

► Nondecreasing

► Nonincreasing

Question No: 29 (Marks: 1) - Please choose one

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For a sequence $\{a_n\}$ if the ratio of successive terms $\frac{a_{n+1}}{a_n} < 1$ then the sequence is known as:

- Increasing
- Decreasing
- Nondecreasing
- Nonincreasing

Question No: 30 (Marks: 1) - Please choose one

For a sequence $\{a_n\}$ if the ratio of successive terms $\frac{a_{n+1}}{a_n} \geq 1$ then the sequence is known as :

- Increasing
- Decreasing
- Nondecreasing
- Nonincreasing

Question No: 31 (Marks: 1) - Please choose one

Which of the following option is true for the sequence $a_n = \left\{\frac{1}{n}\right\}_{n=1}^{\infty}$?

- Increasing
- Decreasing
- Nonincreasing
- Nondecreasing

Question No: 32 (Marks: 1) - Please choose one

If the partial sum of a series is finite then the series will/will be:

- Divergent
- Convergent
- Give no information

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Question No: 33 (Marks: 1) - Please choose one

If the geometric series $a + ar + ar^2 + ar^3 + ... + ar^{k-1} + ... \quad where\ (a \neq 0)$, $|r| < 1$

then which of the following is true for the given series?

- Converges
- Diverges
- Gives no information

Question No: 34 (Marks: 1) - Please choose one

If $\rho = \lim_{k \to +\infty} \frac{u_{k+1}}{u_k}$ where $\rho > 1$ then the series $\sum u_k$ with positive terms will

/will be.....?

- Convergent
- Divergent
- Give no information

Question No: 35 (Marks: 1) - Please choose one

If $\rho = \lim_{k \to +\infty} \sqrt[k]{u_k}$ where $\rho > 1$ then the series $\sum u_k$ with positive terms will

/will be.....?

- Convergent
- Divergent
- Give no information

Question No: 36 (Marks: 1) - Please choose one

In alternating series test, which one of the following condition must be satisfied?

- $\lim_{k \to \infty} a_k = 1$
- $a_1 > a_2 > a_3 ..... > a_k > ....$
- $a_1 \leq a_2 \leq a_3 ..... \leq a_k \leq ....$

Question No: 37 (Marks: 1) - Please choose one

$\sum (-1)^n a$

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A series of the form $\sum_{k=1}^{k}$ is called_____.

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- Alternating series
- Geometric series
- Arithmetic series
- Harmonic series

Question No: 38 (Marks: 1) - Please choose one

Which of the following is the Maclaurin series for e^x?

- $1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \ldots + \frac{x^k}{k!} + \ldots$
- $x + \frac{x^2}{2!} + \frac{x^3}{3!} + \ldots + \frac{x^k}{k!} + \ldots$
- $1 + x + \frac{x^3}{3!} + \ldots + \frac{x^k}{k!} + \ldots$
- $1 - x + \frac{x^3}{3!} - \ldots - \frac{x^k}{k!} - \ldots$

Question No: 39 (Marks: 1) - Please choose one

Which of the following is the work done *W* if an object moves in the positive direction along a coordinate line while subject to a force *F(x)* in the direction of motion over an interval [0,3]?

- $W = \int_2^3 3xdx$
- $W = \int_0^3 3xdx$
- $W = \int_0^3 F(x)dx$

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$$W = \int_{3}^{0} F(x)dx$$

►

Question No: 40 (Marks: 1) - Please choose one

Which of the following is the spring constant *k* if a spring whose natural length is 2*m* exerts a force of 3*N* when stretched 1*m* beyond its natural length?

► 3 *x*
► 3 *N/m*
► 2 *m*
► 3 *m/N*

Quiz from Lecture (26 t0 45)

In which theorem thereis a relation between definite and indefinite integraL 1st theorem of calculus

$\int_a^b fxdx$ = $-\int_b^a fxdx$

Correct answer r is $\int_a^b fxdx$ = $\int_a^c fxdx + \int_c^b fxdx$

If a function is ……..on closed interval [a,b] than f has bpth minimum and maximum values continous

AREA between Y=cosx on 0<x<2xis 1

Integration of cos x is $\int \cos x = \sin x + c$

Integration of sin of x is $\int \sin x$ -cosx

Formula of volume is $V = \int_a^b Axdx$

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According to mean value theorem lim=f(X)/G(X) $\frac{f'(x)}{g'(x)}$

$\int cf(x)dx = ...$ $c\int f(x)dx$

At which point the two curves
$y = x^2 \ \ AND \ \ y = x + 6$ intersect x=2 x=3

If integration of f(x) form [-1,2] =4 anf g(x) from [-1,2]=8 than [2(f(x))+3(g(x))] from [-1,2] is =32

$\int (1-2x)dx \ from \ [0,1] \ is$

0

Area between y=x y=-x(x-4) is 9/2

Y=4$^{x^2}$ y=6x-2 than area will be 1/12

$\int_{2}^{-2} |x|\, dx$ is 0

$\int_{0}^{2} x(x^2+1)^3 dx = ?$ 78

$\int_{0}^{1} (1-2x)dx = ?$ 0

$\int_{0}^{2} x(x^2+1)^3 dx = ?$ 78

(x^2-1) has critical path at point 1/2

Volume of sphere is … $\frac{4}{3}\pi r^3$

$\int_{0}^{1} e^{-x} dx =$ none of above

$\int_{a}^{x} \frac{t^2}{2} dt$ represent both a and x

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Sigma or Σ is an ……letter in Greek. Upper case

If both upper and lower limit of a function is same than $\int_a^a f(x)dx$ = 0

$\int_a^b f(x)dx$ = correct option is $-\int_b^a f(x)dx$

$\int_a^b f(x)dx$ = correct option is $\int_a^c f(x)dx + \int_c^b f(x)dx$

If f ic continuous on[a,b] and f is antiderivatives of on [a,b] than $\int_a^b fxdx$ = F(b)-F(a)

If upper and lower limit of a function is same(equal) than $\int_a^a fxdx$ =? 0

Integration of function is $\int x^2 dx$ = $x^3/3 + C$

Volume of cylinder has base b and height h is V=A.h

Pressure is =? Force per area(F/A)

PASCAL UNIT IS WRITTEN AS N/m^2

3 Common unit of work is foot pound, dyne centimeter ,newton meter

Si unit of force is 3 unit =pound(lbs),dynes or newton (N)

Unit of work is joule

Distance formula is based on pathagorus theorem

Integration

of $\int_0^{\pi} \sin x dx$ is…….. 2

$\int_0^{\pi/4} \tan x^2 dx$ = 1- $\frac{\pi}{4}$

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Integration of $\int_0^{\pi} \cos x dx$ 0

$\frac{d}{d(x)}[\int x dx]$ =..... x

Integration of $\int_0^{2\pi} \cos x dt$ = 1

Integration of $\int_0^{2\pi} \sin x dt$ =..... -1

$\int_0^1 t^3 dt$ is

..... ¼

$\int_0^2 \pi (fx)^2 dx = ? \quad when \quad f(x) = x^2$ 32

L hopital rule cab be applied on intermediate form? yes

If $\lim_{x \to 0} \frac{f(x)}{g(x)}$ is in intermediate form we use L hospital rule yes

$\lim_{x \to 0} \frac{\sin 2x}{x} = ?$ 2

$\lim_{x \to 0} \frac{\sin x}{x} = ?$ 1

$\lim_{x \to 0} \frac{e^{x^2} - 1}{\cos x - 1} = ?$

$\lim_{x \to \infty} \frac{\tan(x)}{\ln(x)} =$ 0

$\lim_{x \to a} \frac{\ln \tan(x)}{\ln(x)} = ?$ .1

.....function is function has same continuous function on a same domain smooth

Derivative of a constant function is 0

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Integration of a constant function is can not be 0

Derivative of a function a-7 where a is constant is 0

Integration of x

Important formula and point from Lecture (26 t0 45)

Plan curve not a line is in…… plane 2 dimension if if cross sectional area is perpendicular to y axis than volume of a solid is $\int_a^b Aydy$

if cross sectional area is perpendicular to y axis than volume of a solid is $\int_a^b \pi[f(y)]^2 dy$

if cross sectional area is perpendicular to x axis than volume of a solid is $\int_a^b Axdx = ?$

if cross sectional area is perpendicular to x axis than volume of a solid is $\int_a^b \pi[f(x)]^2 dx$

volume of cylindrical shell is $(\pi r_2^2 - \pi r_1^2)h$

volume of washer perpendicular to x axis is $V = \int_a^b \pi[u(x)]^2 - [v(x)^2]dx$

a……..is function has same continuous derivatives order over same domain. Smooth

if curve revolve around y axis than volume is? $\int_a^b \theta f(x)^2 dx$

Work done =? W=F.D

SI unit of work is joule

If a force is 500 and distance is 6 than word done is w=3000

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2,5)(-1,1) has
distance 5

Answer:

$$dis\tan ce = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$dis\tan ce = \sqrt{(-1-2)^2 + (1-5)^2}$$
$$dis\tan ce = \sqrt{(-3)^2 + (-4)^2}$$
$$d = \sqrt{9+16} = \sqrt{25} = 5$$

(3,-2)(4,0) has

distance $\sqrt{5}$

Form of L hopital rule is 0/0

Form of intermediate

is $\infty \ / \ \infty \ , 0, \infty, -\infty$

If f is continuous on [a, b] and if F is an antiderivative of f on [a, b] , then $\int_a^b f(x)dx =$ F(b)-F(a)

Find length if f(x)=4x is and [0,2] $= L = \int_0^2 \sqrt{1+(4x)^2}\,dx$ Or L= $\sqrt{17}$

Y=sinx [0, π] lengt h

is is $L = \int_0^{\pi} \sqrt{1+(\cos x)^2}\,dx$

Y=3x from [0,1] than length is L= $\sqrt{10}$

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Solution : $f(x)=x^2$

$than$

$$\int_0^2 \pi(x^2)^2\,dx=\int_0^2 \pi(x^4)\;dx=\pi\int_0^2 (x^4)\;dx=\pi[\frac{x^5}{5}|_0^2]$$

$$=\frac{\pi}{5}[x^5\,|_0^2]=\frac{\pi}{5}[2^5\;-0]=\frac{32\pi}{5}$$

If
u=x^2+1than du=? 2xdx

If y=3x from [0,1] than length
is $\sqrt{10}$

If y=4x from [0,1] than length is $L=\int_0^1 \sqrt{1+(1)^2}\,dx$ or $\sqrt{17}$

If y=x from [0,1] than lengt is 1

If y=x from [0,2] than length is 1

If y= x^2 from [0,2] than length
is $\int_0^2 \sqrt{1+4}x^2$

If y=sinx from 0 to π than length i? $\int_0^{\pi} \sqrt{1+(\cos x^2)}dx$

Si unit of Pascal = N/m^2

is $V=\int_a^b \pi[u(y)]^2-[v(y)^2]dy$

The length of the WHOLE polygonal path will
be $L_K=\sum_{k=0}^{1} \sqrt{1+(f'(x_k)^2}\Delta x_k$

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Formula from Lecture (23 to 25

Volumes by cross sections perpendicular to the y axis $$volume = \int_a^b A(y)dy$$

Volumes by cross sections perpendicular to the x axis $$volume = \int_a^b A(x)dx$$

Volumes by cross sections perpendicular to the y axis $$volume = \int_a^b \pi[f(y)^2]dy$$

Volumes by cross sections perpendicular to the x axis $$volume = \int_a^b \pi[f(x)^2]dx$$

The cross section at x has radius f(x) so the area of this cross section is $A(x) = \pi[f(x)^2]$ The cross section at y has radius f(y) so the area of this cross section is $A(y) = \pi[f(y)^2]$

Area= length *width

Volume = (length *width)height

Newton's method.= $$x_{n+1} = x_n - \frac{x_n - \cos(x_n)}{1 + \sin(x_n)}$$

Rolle's theorem = $$y = \frac{f(b) - f(a)}{b - a}(x - a) + f(a)$$

Mean Value Theorem= $$f'(c) = \frac{f(b) - f(a)}{b - a}$$

Indefinite Integral = $$\frac{d}{dx}F(x) = f(x)$$

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DERIVATIVE FORMULA	EQUIVALENT INTEGRATION FORMULA
$\frac{d}{dx}[x^3] = 3x^2$	$\int 3x^2 dx = x^3 + C$
$\frac{d}{dx}[\sin x] = \cos x$	$\int \cos x dx = \sin x + C$
$\frac{d}{dt}[\tan t] = \sec^2 t$	$\int \sec^2 t dt = \tan t + C$
$\frac{d}{dx}[u^{3/2}] = 3/2u^{1/2}$	$\int 3/2u^{1/2} du = u^{3/2} + C$

Properties of Indefinite Integral = $\frac{d}{dx}\int f(x)dx = f(x)$

Properties of Sigma notation is

1 $\sum_{k=1}^{n} ca_k = c\sum_{k=1}^{n} a_k$

2 $\sum_{k=1}^{n} (a_k + b_k) = \sum_{k=1}^{n} (a_k) + \sum_{k=1}^{n} (b_k)$

3 $\sum_{k=1}^{n} (a_k - b_k) = \sum_{k=1}^{n} (a_k) - \sum_{k=1}^{n} (b_k)$

Formulas of sigma notation (summation

$\sum_{k=1}^{n} k = 1+2+3+..... = \frac{n(n+1)}{2}$

$\sum_{k=1}^{n} k^2 = 1^2+2^2+3^2+..... = \frac{n(n+1)(2n+1)}{6}$

$\sum_{k=1}^{n} k^3 = 1^3+2^3+3^3+..... = [\frac{n(n+1)}{2}]^2$

$L_K = \sqrt{\Delta x_k{}^2 + \Delta y_k{}^2}$

$L_K = \sum_{k=0}^{1} \sqrt{1+(f'(x_k)^2}\Delta x_k$

$L_K = \int_a^b \sqrt{1+(f'(x)^2}dx$

Work done by a constant force W=F.d

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1st fundamental theorem of calculus is= $\int_a^b f(x)dx$ = F(b)-F(a

Volume of a

Average Values of of a function= $f_{avg} = \frac{1}{b-a}[\int_a^b f(x)dx]$

Area of 2 function is f(x) and g(x) is = $\int_a^b f(x)dx - \int_a^b g(x)dx ==$

Formula of volume is

$$volume = \int_a^b A(x)dx] = \lim_{\Delta x_k \to 0} \sum_{k=1}^{n} A(x_k^*)\Delta x$$

cylindrical shell can be expressed as V=A.h = $(\pi r_2^2 - \pi r_1^2)h$

Formulaof length is

1

$$A = \lim_{\max \Delta k \to 1} \sum_{k=1}^{n} f(x_k^*)\Delta x$$ ==F(b)-F(a)

Area of washers perpendicular to yaxis $A(y) = \pi[f(y)^2 - g(y)^2]$

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Area of washers perpendicular to x axis $A = \pi[f(x)^2 - g(x)^2]$

Volume of washers perpendicular to y axis $v = \int_c^d \pi[f(y)^2 - g(y)^2]$ dy

Volume of washers perpendicular to x axis

.

The right part is called the closed form of the sum

d/dx(3sec x)= 3secxtanx

if fliud surface area is submerged horizontaly in fluid at depth h find force perpendicular to surface is define

1. $L_k = \int_a^b \sqrt{(\Delta x_k)^2 + (\Delta y_k)^2}$

$L_k = \int_a^b \sqrt{1 + (f'x_k)^2}\,dx$

$\sum_{k=1}^{n} L_k = \sum_{k=1}^{n} \sqrt{1 + (f'x_k)^2}\,\Delta x_k$

Length of curve y=x x=0 to 2 is ?

$L = \int_0^2 \sqrt{1 + (1)^2}\,dx$

Length of curve y=x x=0 to 1 is ?

Length of whole polygonal path is $\sum_{k=1}^{i} L_k = \sum_{k=1}^{n} \sqrt{1 + (f'x_k)^2}\,\Delta x_k$

If y=a y=b than length is $L = \int_a^b \sqrt{1 + (dy/dx)^2}\,dx$

If y=$(x)^2$ from 0 to 2 than length

volume of washer perpendicular to y axis

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Formula of area as a limit

is ……

$$A = \lim_{n\to\infty} \sum_{k-1}^{n} f(x_k^{*})\Delta x$$

Where x_k^{*} =?

$x_k^{*} = x_{k-1} = a + (k-1)\Delta x$	Left end point
$x_k^{*} = x_k = a + k\Delta x$	Right end point
$x_k^{*} = \frac{1}{2}(x_{k-1} + x_k) = a + (k - \frac{1}{2})\Delta x$	Midpoint

Area of

trapezoid=….

$$A = \frac{1}{2} h(b_1 + b_2)$$

$$A = \lim_{\max \Delta k \to 1} \sum_{k=1}^{n} f(x_k^{*})\Delta x$$ =

Properties of integration is ……

$$\int_a^b cf(x)dx = c\int_a^b f(x)dx$$

$$\int_a^b [f(x) + g(x)]dx = \int_a^b [f(x)dx] + \int_a^b [g(x)]dx$$

$$\int_a^b [f(x) - g(x)]dx = \int_a^b [f(x)dx] - \int_a^b [g(x)]dx$$

)

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$$V = \int_a^b \pi[(x)^2 - g(x)^2] \, dx$$

Volume of disk perpendicular to x axis

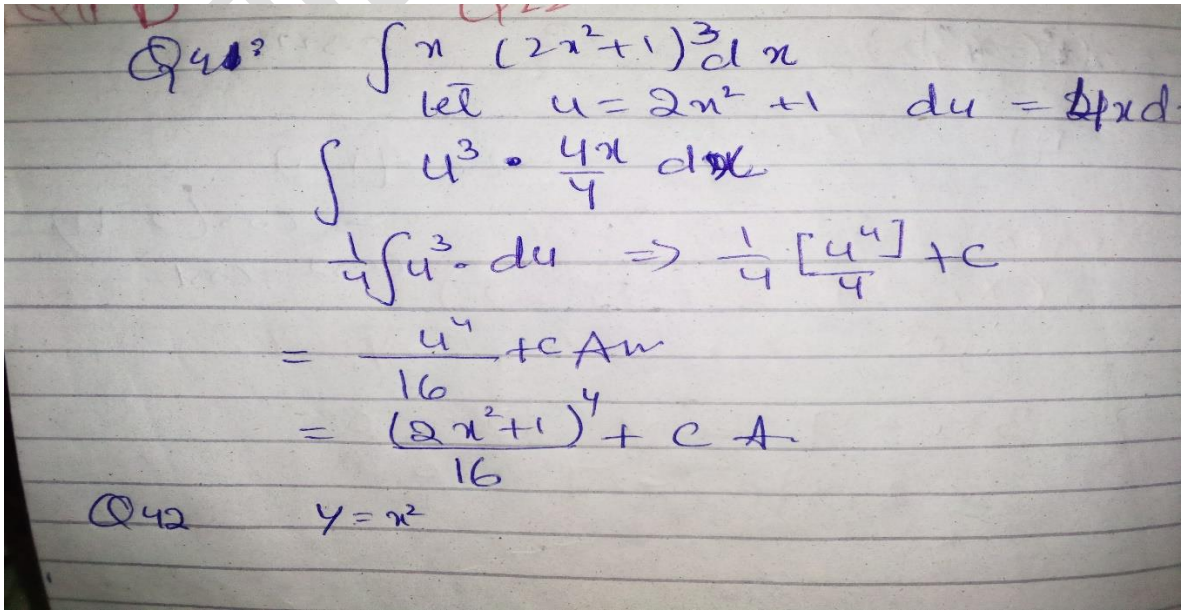
Volume of disK

.

Question No: 41 (Marks: 2)

Evaluate the following integral by substitution method.

$$\int x\,(2x^2+1)^{\frac{2}{3}}\,dx$$

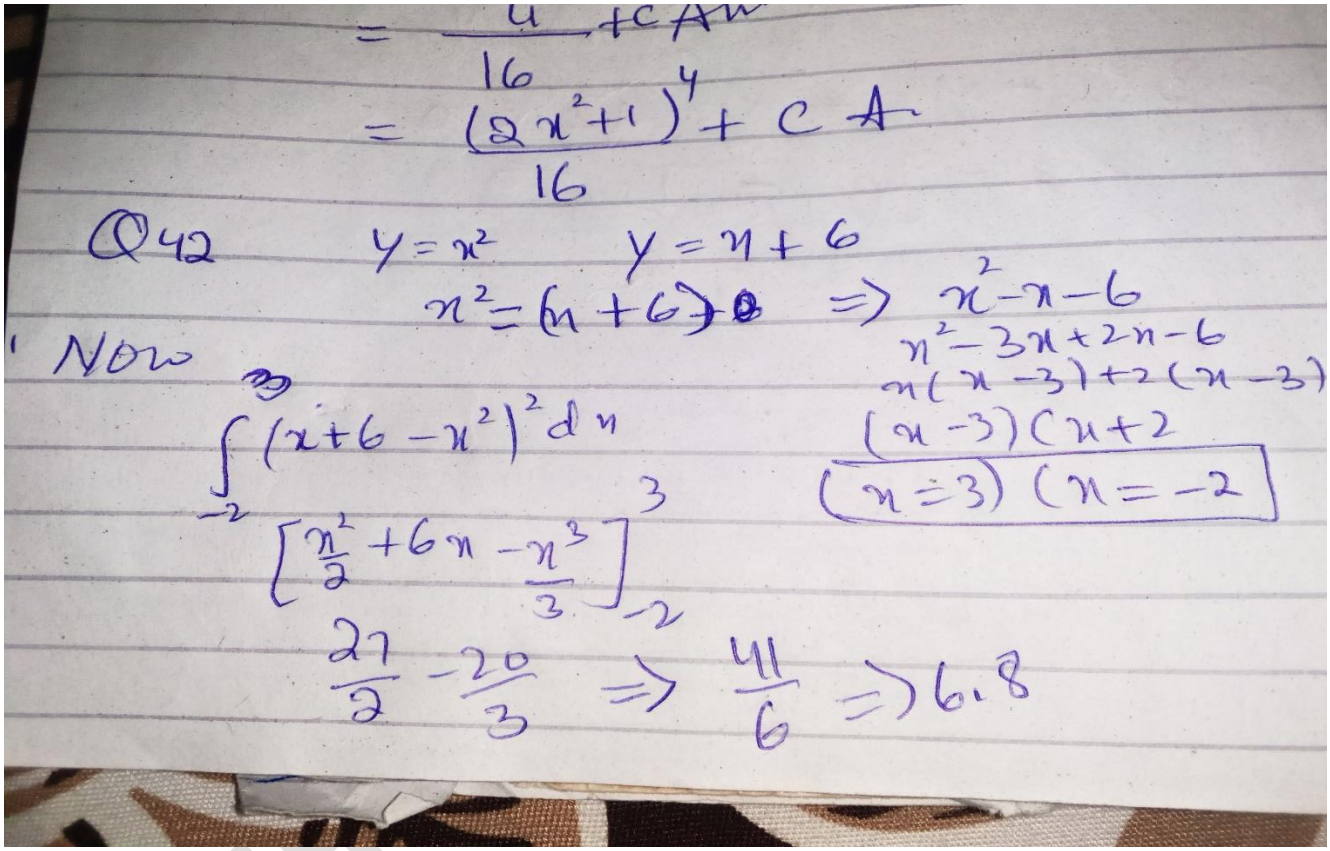


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Question No: 42 (Marks: 2)

Find the limits of the integral indicating the area bounded by the curves $y = x^2$ and $y = x + 6$.

Sol,



Question No: 43 (Marks: 2)

What will be the amount of work done if an object moves 7*m* in the direction of a force of 70*N*?

W=?

W=f.d
W=70N*7m
W=490Nm
W=490J

Question No: 46 (Marks: 3)

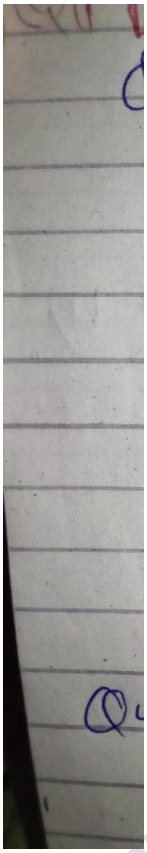
Find the spring constant '*k*'; if a force of 10*N* is required to stretch a spring from its natural length of 4.8*m* to a length of 6.8*m*?

Question No: 47 (Marks: 5)

$$\frac{d}{dx}\left[f(x) \right] = 12x^2 - 6x + 1$$

.

FIND $f(x)$



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