

**MTH101 QUIZ 3 BY IQRA AZHAR**

# **MTH101**

## **Quiz no 3**

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***Solved by***

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$(1^2) + (2^2) + (3^2) + \dots + (50^2)$  equals-----NOTE:  $x^n$  means 'x' to the power 'n'

$$\frac{n(n+1)(2n+1)}{6}$$

$$\frac{50(50+1)(2 \times 50+1)}{6}$$

$$42925$$

Summation of 2 where sum ranges from 0 to 10 equals 20. t f

If you add 2 ten times, you get

$$2 \times 10 = 20$$

$$\sum_{i=0}^{10} 2 = 20$$

So, the statement is true,

Which geometrical figure is used for approximating the area under the curve?

Trapezoid

The area between  $f(x) = -x$  and the closed interval  $[-1, 0]$  on x-axis is -----

$$\text{Area} = \int_{-1}^0 (-x) dx$$

$$\text{Area} = \left[ -\frac{x^2}{2} \right]_{-1}^0$$

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

The estimated area under  $f(x) = x^2$  from  $x = 1$  to  $x = 3$  with right end points for  $n = 2$  is \_\_\_\_\_.

$$= \sum_{i=1}^3 f(x_i) \cdot \Delta x$$

$$\Delta x = \frac{b-a}{n} \quad a=1, b=3, \text{ and } n=2.$$

$$\Delta x = 1$$

$f(x) = x^2$  at the right endpoints of the subintervals:

$$= \sum_{i=1}^3 f = 1 + 4 + 9$$

$$= 13$$

$$= 13 \times 1$$

$$13$$

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By applying mean value theorem to the function  $f(x) = \ln x$  in the interval  $[1, e]$ , the corresponding value of 'c' is ----- (Hint:  $\ln e = 1$ ,  $\ln 1 = 0$ )

Now, apply the Mean Value Theorem:

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

$$f(x) = \ln(x)$$

$$f(c) = \frac{f(e) - f(1)}{e - 1}$$

$$f(c) = \frac{\ln(e) - \ln(1)}{e - 1}$$

Which of the following will be left end points if the interval  $[-2, 2]$  is divided into 4 equal subintervals

$-2, -1, 0, 1$ .

To find the area between continuous curve  $f(x)$  and the closed interval  $[a, b]$  on x-axis, we take----- of  $f(x)$  on the interval  $[a, b]$ .

integrate the absolute value of the function

By using Newton method, which of the following is the poorest initial approximate solution of equation:  $x + \cos x = 0$ ?

doesn't converge or divergence.

Integral of  $3\sec(x)\tan(x)$  is NOTE:  $x^n$  means 'x' to the power 'n'  
 $\sec(x)\tan(x)dx$ . This will simplify the integral.

$3\sec(x) + C$ , where

Given  $f(x) = 1/(x-1)$  on the interval  $(0, 3)$ , then 'f' has no relative maxima or relative minima due to..... Open interval      Discontinuity in the interval  
Rational function      none of

"Discontinuity in the interval."

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The integral  $\int \cot(2x) dx$  will be equal to

$$\ln|\sin(2x)| + C,$$

If 'n' goes from 1 to 3 and the summation of 'na' = definite integral of '1' on closed interval [0,1], then the value of 'a' = -----

$$\sum_{n=1}^3 na = \int_0^1 1$$

$$1a + 2a + 3a = x \Big|_0^1$$

$$6a = 1 - 0$$

$$a = 1/6$$

If 'n' goes from 1 to 4 and the summation of 'na' = Maxima of  $(e^x)$  in the interval  $[-e, 0]$ , then the value of 'a' is -----

$$\sum_{n=1}^4 na = \text{Maxima of } (e^x) \text{ in}$$

$1a + 2a + 3a + 4a =$  The maximum occurs at  $x = 0$ , so :

$$10a = e^0$$

$$10a = 1$$

$$a = 1/10$$

If 'n' goes from 1 to 3 and the summation of 'na' = 6a, then the value of 'a' is -  
-----

$$\sum_{n=1}^3 na = 6a$$

$$1a + 2a + 3a = 6a$$

$$6a = 6a$$

undefine

$1+2+3+\dots+539$  equals \_\_\_\_.

$$S_n = \frac{n}{2} (2a + (n-1)d)$$

$$a=1, d=1, n=539.$$

$$= 145,530$$

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Why the equation:  $x^2 + 8 = 0$  does not have approximate solution while using Newton's method?

It is always non negative

Mean value theorem states that between any two points A and B on a curve  $y=f(x)$ , there must be at least one point where the Tangent line to the curve is.....joining A and B

parallel to the secant line

If  $f(x) = x^3$  is defined on the interval  $[1, 3]$ , then which of the following is true about it.

Its absolute minimum value exists at the endpoint

Integration of  $3x^2$  with respect to  $x$  is.....

$x^3 + C$ ,

If  $x = 3 + 4 + \dots + 20$ , then  $x = \underline{\hspace{1cm}}$

207

$1+2+3+\dots+339$  equals \_\_\_\_.

57,630

For any continuous function on the interval  $[0,1]$ , if the area under this curve is divided into '5' equal rectangles, then the length of each rectangle will be.....

$\Delta x = \text{number of subintervals} / \text{total interval length}$

$\Delta x = 1-0/5$

1/5

Sigma notation is used to write lengthy.....in compact form.

sums

If  $x = (3+4+5+\dots+10) + \{(3^3) + (4^3) + (5^3) + \dots + (10^3)\}$ , then  $x = \underline{\hspace{1cm}}$

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3070.5.

integration of  $x^{-10}$  is

$$-1/9x^9 + c$$

.

How many subintervals of length '2' will be formed for the interval [4,16] ?

The number of subintervals of a given length within a specific interval can be found using the formula:

6

Let  $f(x) = x^3$  and  $a = -5$ ,  $b = 5$  and  $n =$  no. of partition of  $[-3,3] = 4$ . Let the widths of first, second, third and fourth intervals be 3, 0, 1, 2 respectively. Then the "Mesh size" of partition is.....

is 3.

If  $[-8,8]$  is subdivided into '16' equally spaced subintervals, then the MIDDLE point of 8th sub-interval will be-----.

-0.5

The function  $f(x) = 2x^3 - 15x^2 + 36x$  has the critical points .....on the interval  $[1,5]$

3,2

If  $x = 1 + 2 + 3 + 4 + \dots + 20$ , then  $x =$  \_\_\_\_\_

$x = 210$ .

$1^2 + 2^2 + 3^2 + \dots + 19^2$  equals \_\_\_\_\_.

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19×20×39/6

Maximum of the function  $f(x)=2x+7$  occurs at

$X=0$

Integration of  $(\cos/\sin) \cdot \operatorname{Cosec} x$  with respect to  $x$ .....

$-\operatorname{cosec} x$

Sum the first three terms of the series, whose general term is  $5k_i$  Where first term= $k_1=10$ , Second term= $k_2=14$  Third term= $k_3=-2$  The correct choice is .....Note: 1, 2, 3 and  $i$  with  $k$  are in subscript

110

The integral  $\int \sin(5x) dx$  will be equal to ?

$-\frac{1}{5}[\cos(5x)+C]$

The estimated area under  $f(x) = x^2$  from  $x = 1$  to  $x = 3$  with right end points for  $n = 2$  is \_\_\_\_\_.

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Subdivide the interval  $[0, 1]$  into 2 equal parts, and then the width of each sub-interval will have length .....

$\frac{1}{2}$

$n$  approximation to an area  $R_n$  (where  $n$  is subscript) when limit is taken as  $n$  goes to infinity, approximation becomes actual area.  $t f$

true

The integral  $\int \frac{6x}{(3x^2+1)^2} dx$  will be equal to

$[-\frac{1}{3x^2+1}] + C$

If  $f(x) = \sin(x) + x$ , then which of the following is true about its integration none of The estimated area under  $f(x) = 12/x$  from  $x = 1$  to  $x = 3$  with left end points for  $n = 2$  is \_\_\_\_\_.

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The maximum and minimum values of the function  $f(x)=1/x$  does not lie in the interval  $[-1,1]$  because ----- functio is ....on  $[-1,1]$

discountinous one to one

$(x) = (x^2)+1$  is a continuous function on  $(-\infty, +\infty)$  , and 'f' has no absolute maximum on  $(-\infty, +\infty)$  because.....

positive value

If  $f(x)=(x^3)+(x^2)+x+1$  , then 'f' is continuous and differentiable everywhere because 'f' is a .....

.polynomial

The area of a rectangle can be found by simply .....its dimensions.

multiply

What is length of each subinterval if the interval  $[-1,1]$  is divided into n subintervals of equal length.

$2/n$

While solving the equation,  $10x-(e^x)=0$  by using Newton method, if  $x=0$  is the initial approximate solution then the next approximation will be-----

$-1/9$

In the indefinite integral of  $x(y^2)$  w.r.t 'y' , the term ..... serve to identify the independent variable in the function. $x \ y \ dy \ x|^2$

dy

If a function  $f(x)$  is defined on an interval  $[a, b]$  satisfying the conditions of the Rolle's Theorem, then which of the following is true about it. it has absolute max min

none of

y applying Roll's theorem on  $f(x) = x$  over the interval  $[-1,1]$ , the points where the derivative of  $f(x)=x$  is not taken are.....

$-1,1$

In the indefinite integral of  $x(y^2)$  w.r.t 'y' , the independent variable is .....

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Y

If 'n' goes from 1 to any large EVEN number then the summation of  $(-1)^n$   
= -----0

integration of  $\cot x \operatorname{cosec} x$  with respect to  $x$  is -----

$-\operatorname{cosec} x$

Absolute minimum of the function  $f(x)=x$  in the semi open interval  $(0,2]$  is-----

- 0

Critical point of  $f(x)=-\sin x$  in the interval  $[0,\pi]$  is--

$\pi/2$

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