Biggest Maths-3 Buzz Now or Never Offer !

Inspiring the Future

Fulfilling aspirations, raising barriers, surpassing Expectations

ધ્રુવીલ બોરડ : ૯૬૮૭૦ ૦૫૫૭૫

શ્રીનાથજી એન્જીનીયરીંગ ઝોન

All Sem All Branch Addmission Open

For All Engineering Mathematics

Diploma & Deegree Engineering

Maths-1 (CALCULUS)

Maths-2 Maths -4

Maths-3

Understand Concepts Enjoy Learning

Enjoy learning Of Easy Mathmetics By Highly Quality Faculties

CRASH COURSE 100% RESULT

Maths-3 ના આગાઉ Crash Course માં ખુબજ સારો Response બદલ આપ સૌનો ખુબ આભાર.તમામ સ્ટુડન્ટસ ને આપેલ Question Bank માંથી 45-50 Marks નુ GTU માં Questions બદલ્યા વગર પુછાતા શ્રીનાથજી એન્જીનીયરીંગ ઝોન પ્રત્યે સ્ટુડન્ટસ ઓ એ ખુબ સારો વિશ્વાસ વ્યકત કર્યો છે.

2 Hours NONSTOP MATHS-3 FOR Perfect Results

Resgistration Contact : 96870 05575

Crash Course Available At New Ranip

Branch-1 F.F-30 Aryavilla Residency,Anand Partyplot, G.S.T Crossing Road.New Ranip.Ahmedabad

Branch-2 A/21 Krushnanagar Soc.Indiacolony Road, Bapunagar , Ahmedabad

100 % Result !! Attention !! Grab Your Good Result Now

Crash Course Special 100% Results

Highest Results in GTU 2017-18 & Exclusive IMP By Proff,D.G BORAD Last Two Years 1000 % Results Proven With Over 300+ Students Clear Maths After Join SHREENATHJI ENGINEERING ZONE & Witness Most Successful Engineering Class

Once again See the Power of Dhruvil Borad
40-45 marks example asked in Maths - 3
IMP Given by Dhruvil Borad..
SUCCESS
Imp posted in @Ametogtuvada
@Gujju_comedy
@anokhogujju
More then 1500 students save the post
Wich is Given By Dhruvil Borad..
For All Engineering Tution
Shreenathji Education
DhruvilBorad(9687005576)
BRANCH 1
NEW RANI
BRANCH 2
INDIA COLONY
BRANCH 2
AANAND
Thanks all the students Trust on Shreenathji Education.
Wish You all Bright future Ahead...
More then 500 students send DM Dhruvil Borad on Instagram.
Wish you all Best results in your exam..
Thanks for Trust on us...
Thanks for being a part of
Shreenathji Education
Feel proud to help future Engineer...
Thank You

15/9 1

Power-Series.

#Marks.

HomeWork :- $y'' = y'$ $\therefore y'' - y' = 0$.

*Imp. $\boxed{(1+x^2)y'' + xy' - 9y = 0}$ ✓ most Imp (ATU) ✓ 110%

(*) Solve; $y' = 2xy$ by power series Method.

Sol^n. Given eq^n :- $\boxed{y' - 2xy = 0}$

✓ $y'' + P(x)y' + Q(x)y = 0$

$$\boxed{y'' = \sum_{k=0}^{\infty} a_k \cdot k(k-1)\, x^{k-2}}$$

$P(x) = 1$ $Q(x) = -2x$

which is finite at $x = 0$.

$\therefore x = 0$ is a ordinary point.

Let; $y = \sum_{k=0}^{\infty} a_k x^k$

$$y' = \sum_{k=0}^{\infty} a_k \cdot k\, x^{k-1}$$

Substitute in given equation we get;

$$y' - 2xy = 0$$

$$\sum_{k=0}^{\infty} a_k \cdot k \cdot x^{k-1} - 2x \sum_{k=0}^{\infty} a_k x^k = 0$$

$$\sum_{k=0}^{\infty} a_k \cdot k \cdot x^{k-1} - \sum_{k=0}^{\infty} 2a_k\, x^{k+1} = 0$$

Rule=1. ઘાત સરખી કરવી.
જે અહીંથી હોય એમા જેવી લાવવી.

$$\sum_{k=0}^{\infty} a_k \cdot k\, x^{k-1} - \sum_{k=2}^{\infty} 2a_{k-2}\, x^{k-1} = 0$$

Rule.2

(Limit સરખી કરવી.)

(limit જો વધારે હોય તો સરખી થાય.) કોઈકવાર

$$a_1 + \sum_{k=2}^{\infty} a_k \cdot k\, x^{k-1} - \sum_{k=2}^{\infty} 2a_{k-2}\, x^{k-1} = 0$$

(સરખી ઘાતવાળામાંથી common લેવા.)

(અંતિમ a નાં sufficient માં જે વધારે હોય તેને કર્તા (subject) બનાવવા)

$a_1 = 0$ & $a_k \cdot k - 2a_{k-2} = 0$ $\therefore a_k k = 2a_{k-2}$

$$\therefore a_k = \frac{2a_{k-2}}{k}$$

$\Rightarrow$ for $k=2$; $a_2 = \frac{2a_0}{2} = a_0$

$k=3$ $a_3 = \frac{2a_1}{3} = 0$

$k=4$ $a_4 = \frac{2a_2}{4} = \frac{2 \times a_0}{4} = \frac{a_0}{2}$

$k=5$ $a_5 = \frac{2a_3}{5} = \frac{2}{5}(0) = 0$

$k=6$ $a_6 = \frac{2a_4}{6} = \frac{\cancel{2}}{6}\frac{a_0}{\cancel{2}} = \frac{a_0}{6}$

Sol^n:-

$$y = a_0 + a_1 x + a_2 x^2 + a_3 x^3 + a_4 x^4 + a_5 x^5 + a_6 x^6 + \dots$$

$$\boxed{y = a_0 + a_0 x^2 + \frac{a_0}{2}x^4 + \frac{a_0}{6}x^6 + \dots}$$

Rule-1 Power સરખી કરવી.

Rule-2 Limit સરખી કરવી

Rule-3. a ના suff.. કે બહાર કોમન લેવો.

Power- Series.

॥શ્રી કૃષ્ણ શરણં મમઃ॥

$a_2 = \frac{9}{2}a_0$, $a_3 = \frac{4}{3}a_1$, $a_4 = \frac{5a_2}{12} = \frac{5}{12}\cdot\frac{9}{2}a_0 = \frac{45}{24}a_0$ ...

$y = a_0 + a_1x + a_2x^2 + a_3x^3 + a_4x^4 + a_5x^5 + \cdots$

$$\boxed{y = a_0 + a_1x + \frac{9}{2}a_0x^2 + \frac{4}{3}a_1x^3 + \frac{45}{24}a_0x^4 + \cdots}$$

(*) find the series solution of $(1+x^2)y'' + xy' - 9y = 0$ (GTU, 2012, 2014, 2015, 2016).

ઓછું
વધુ
વધુ.

$\therefore y'' + \frac{x}{1+x^2}y' - \frac{9}{1+x^2}y = 0$

$y'' + P(x)y' + Q(x)y = 0$

$P(x) = \frac{x}{1+x^2}$ & $Q(x) = \frac{-9}{1+x^2}$

$\Longrightarrow x = 0$ is an ordinary point.

Let, $y = \sum_{k=0}^{\infty} a_k x^k$

$y' = \sum_{k=0}^{\infty} a_k \cdot k\, x^{k-1}$

$y'' = \sum_{k=0}^{\infty} a_k \cdot k \cdot (k-1)x^{k-2}$

$$(1+x^2)\sum_{k=0}^{\infty} a_k k(k-1)x^{k-2} + x\sum_{k=0}^{\infty} a_k \cdot k\, x^{k-1} - 9\sum_{k=0}^{\infty} a_k x^k = 0$$

$$= \sum_{k=0}^{\infty} a_k \cdot k(k-1)x^{k-2} + \sum_{k=0}^{\infty} a_k k(k-1)x^k + \sum_{k=0}^{\infty} a_k \cdot k\, x^k - \sum_{k=0}^{\infty} 9a_k x^k = 0$$

$$= \sum_{k=0}^{\infty} a_k k(k-1)x^{k-2} + \sum_{k=2}^{\infty} a_{k-2}(k-2)(k-3)x^{k-2} + \sum_{k=2}^{\infty} a_{k-2}(k-2)x^{k-2} - \sum_{k=2}^{\infty} 9a_{k-2}x^{k-2} = 0$$

$$\sum_{k=2}^{\infty} a_k k(k-1)x^{k-2} + \text{"} \quad \text{"} \quad \text{"} = 0$$

$$a_k k(k-1) + a_{k-2}\left[(k-2)(k-3) + (k-2) - 9\right] = 0$$

$$\boxed{a_k = -\frac{a_{k-2}\left[(k-2)(k-3) + (k-2) - 9\right]}{k(k-1)}}$$