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MAINLAND LECTURE CENTER

MTH232 ELEMENTARY DIFFERENTIAL EQUATION

Any equation which gives the relation between the independent and dependent variables and the derivatives of dependent variables is called a ___equation .
differential

An equation involving one (or more) dependent variable derivatives with respect to one or more independent variables in called a **differential equation**

A differential equation involving only ordinary derivatives (that is, derivatives with respect to a single independent variable) is called an **ordinary differential equation**

Differential equation containing partial derivatives of one (or more) dependent variable with respect to two or more independent variable is called a **partial differential equation**

A _____differential equation contains two or more dependent variables together with their derivatives with respect to a single independent variable which may, or may not, exist explicitly into the equation.
total

the nth derivative of a dependent variable with respect to one or more independent variables is called a ___
derivative of order n

The ____of a differential equation is the order of the highest order derivative appearing in the equation
Order

The ___of a differential equation is the highest exponent of the highest order derivative appearing in it after the equation
degree

When, in an ordinary or partial differential equation, the dependent variables and its derivatives occur to the degree only, and not as higher powers or products, we call the **equation linear**

The coefficients of a linear equation are therefore either constants or functions of the independent variable or variables. If an ordinary differential equation is not linear, we call it **non-linear.**

if a partial differential equation is not linear, it can be **quasi-linear**, **semilinear** or **non-liner.**

A real or complex valued function y = ø(x) defined on an interval I is called a **solution or an integral** of the differential equation g(x, y, y',…., y(n)) = 0 if ø(x) is n time differentiable and if x, ø(x), ø'(x), ….., ø (n) (x) satisfy this equation for all x in I.

The solution of the nth order differential equation with arbitrary 'n'nconstants is called its ___
general solution.

Any solution which is obtained from the general solution by giving particular values to the arbitrary constants is called

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a **particular solution**.

one such condition is to specify the value of y at some point x0 where x0 is in the interval of existence of y. such a condition is called **initial condition** and the problem of solving a differential equation together with the initial conditions is called the **initial value problem (IVP)**

A function f(x, y) is aid to be ____when (x, y) varies in a region in the xy-plane and if there is a number k such that |f| ≤ k when (x, y) is in that region.
bounded

the general solution of a first order differential equation normally contains one arbitrary constant which is called a____
parameter.

Newton's law of cooling states that the rate at which the temperature T(t) changes in a cooling body is proportional to the difference between the temperature of the body and the constant temperature T0 of the surrounding medium.

Any solution which is obtained from the general solution by giving particular values to the arbitrary constants is called a ____of the differential equation.
particular solution

In a differential equation, when the dependent variable and its derivatives occur in the first degree only, and not as higher powers or products, the equation is said to be **linear.**

If an ordinary differential equation is not linear, it is said to be __
nonlinear.

The solution of the nth order differential equation which contains n arbitrary constants is called its **general solution**.

A solution of a differential equation, which cannot be obtained by assigning definite values to the arbitrary constants in the general solution is called its **singular solution.**

Conditions on the value of the dependent variable, and its derivatives, at a single value of the independent variable in the interval of existence of the solution are called the **initial conditions.**

The problem of solving a differential equation together with the initial conditions is called the **initial value problem.**

The general solution of a first order (nth order) differential equation represents **one-parameter** (nm-parameter) family of curves.

An equation of the form $\frac{dy}{dx} = f(x, y)$ is called a **separable equation** or equation in variable separable form if f(x, y) can be put in the form

$\frac{dy}{dx} = \frac{x^2 + xy + y^2}{3x^2 + y^2}$ is an example of **homogenous differential equations**.

In **1621 Leibniz** made known to the world the method of solving homogeneous equation differential equations of the first order.

A real-value function h(x, y) of two variables x and y is called a **homogeneous function** of degree n, where n is a real

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number, if we have $h(\lambda x, \lambda y) = \lambda^{n} h(x, y)$

A differential equation y' = f(x,y) is called a ___differential equation when f is a homogeneous function of degree 0.
Homogenous

first degree differential equations known as **linear equations**

e^{x} is termed as ____factor
integrating

A factor, which when multiplied with a non-exact differential equation makes it exact, is known as an ___
integrating factor

The term integrating factor to solve a differential equation, was first introduced by ____in 1687.
Fatio de Duillier

We say that a differential equation is linear if the _____variable and all its derivatives appear only in the first degree and also there is no term involving the product of the derivatives or any derivative and the dependent variable
dependent

A radioactive substance with a mass of 50 gms. Was found to have a mass of 40 gms. After 30 years. Find its half-life.
25

the **Clairaut's** equation is of the form y = px + f(p)

$\square + by^2 = cm^m,$ where b, c and m are constants. This is known as the special **Riccati equation.**

Matheus's law states that the time rate of change of a population y(t) is proportional to x(t).

F(x, y, c) = 0 represents a curve in the xy-plane and if for variable c it represents infinitely many curves, then the totality of these curves is called a oneparameter family of curves, and c is called the __of the family
parameter

The curves of the two families are said to be mutually orthogonal, they form an orthogonal net, and the curves of the family to be obtained are called the ____trajectories of the given curves
orthogonal

____trajectories of a given family of curves are curves that intersect the given curves at a constant angle θ .
Isogonal

Approximate solutions of differential equations can be obtained by ___methods.
Numerical

f(x, y) = k = const are called curves of constant slope or ___
numerical

An **iteration method** is a method that yields a sequence of approximations to an (unknown) function

A set of functions y1(x), y2(x),…., yn(x) is said to be ____independent on an interval I, if it is not linearly dependent on the interval.

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linear

Non-homogeneous Term is a Product of an Exponential and a Polynomial

Solve the initial value problem \frac{d y}{d x}=2x+3, y(1)=2
y=x^{2}+3x-2

Solve $$\frac{ d y}{dx}+\frac{1}{2}y=\frac{3}{2}$$ with y(0)=2
$$y=3-e^\frac{1}{2}x$

ind the distance which an object falls under gravity in t seconds if it starts from rest
[x=1/2 gt^2\]

The solution of the initial value problem dy/dx=-x/y, y(4)=3 is
\[x^2+y^2=25\]

Solve the equation dy/dx=sinÐ´ÐƒÐ·5x";"y=-1/5 cosÐ´ÐƒÐ·5x+c
y=-5 cosÐ´ÐƒÐ·5x+c

Obtain the solution of the equation\[xy'=4y\]
\[y=cx^4\]

Solve the initial value problem \[(\cosÐ´ÐƒÐ· x \sinÐ´ÐƒÐ· x-xy^2)dx+y(1- x^2 y)dy=0\], y(0)=2
[y^2 (1-x^2)-\cos^2Ð´ÐƒÐ· x=c\]

Find the solution of the initial value problem \[dy/dx=12x^3-2 \sinÐ´ÐƒÐ· x\], y(0)=3
[y=3x^4+2 \cosÐ´ÐƒÐ· x+1\]

Find the general solution of \[y'+2y=x^3 e^{-2x}\]";"\[y=e^{-2x} (x^{4/4}+c)\]
\[y=e^{-2x} (x^{3/5}+c)\]

Which of equations described NewtonÐ´ÑƒÂ»s law of cooling which state that the rate of change with respect to time t of the temperature T(t) of a body is proportional to difference between T and the temperature A of the surrounding medium
dT/dt=-k(T-A)

The general solution of the equation is \[y'+(\cotÐ´ÐƒÐ· x)yÐ¬Ñƒâ€ž=x \csc Ð´ÐƒÐ·x\]";"\[\frac{x^2}{2 \sin x} +\frac{c}{\sinÐ´ÐƒÐ· x}\]
[\frac{x^2}{2 \sin x} -\frac{c}{\sinÐ´ÐƒÐ· x}\]

Solve the equation \[y'=x(1+y^2)\] by using variable separable
\[y=tanÐ´ÐƒÐ·(x^{2}/2+c)\]

"Using integrating factor, solve the differential equation $$\frac{d y}{dx}+y=e^{x}$$
$y=\frac{1}{2}e^{x}+c e^{-x}$$

Use seperable method to solve the differential equation $$\frac{dy}{dx}=xy
e^{\frac{x^{2}}{2}

If \[y=2x+Ce^{x}\] is a solution of the differential equation\[\frac{d y} {d x}-y=2(1-x)\] then find the particular solution satified by x=0, y=3";"\[y=2x+3e^{x}\]
\[y=2x+5e^{x}\]

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Obtain the solution for the initial value problem \[y'+(cot x)y=x csc x, y\left(\frac{\pi}{2}\right)=1\]
\[y=\frac{x^{2}}{2 sin x}+\frac{1-\frac{\pi^{2}}{8}}{ sin x}\]

Solve the differential equation\[y'=x(1+y^{2})\]";"\[y=tan \left(\frac{x^{2}}{2}+c\right)\]
\[y=tan \left(\frac{x}{2}+c\right)\]

Find the general solution \[\frac{dy}{dx}=\frac{2y^{2}+3xy}{x^{2}}\]
\[tan^{-1} x+ tan^{-1} y=-\frac{\pi}{4}\]

Solve the equation \[x\frac{dy}{dx}-ay=x+1\], where \[a\] is a constant
\[y=\frac{x}{1-a}-\frac{1}{a}+cx\]

Find the complete solution of \[\left(D^{4}-8D^{2}+16\right)y=0\]
[y=(A+Bx)e^{2x}+(C+Dx)e^{-2x}\]

Solve the general solution of \[\frac{d y}{ d x }=e^{x}+x+sinx \]
\[y=c e^{-x}\frac{1}{2} e^{x}+x-1+\frac{1}{2}(sin x - cos x)\]

Solve the second order differential equation $$\frac{d^{2} y}{d x^{2}}+\frac{d y}{d x}-2y=0$$
$$y=A e^{-2x}+ B e^{x}$$

Solve the equation undamped simple harmonic motion $$\frac{ d^{2} y}{d x^{2}}+ 4y=0$$
$$y=A\cos 2x +B\sin 2x$$

Solve the equation damped simple harmonic motion $$\frac{ d^{2} y}{d x^{2}}+ 4y=0$$
y=e^{-x}(A\cos 2x +B\sin 2x)

Solve the differential equation $$\frac{d^{2} y}{d x^{2}}+\frac{d y}{d x}-2y=x^{2}$$
y=A e^{-2x}+ B e^{x}-\frac{1}{2}x^{2}-\frac{1}{2}{x-}-\frac{3}{4}

Solve the initial value problem $$\frac{d^{2} y}{d x^{2}}+\frac{d y}{d x}-2y=0 y(0)=2, \frac{d y}{ dx} (0)=5
y=-e^{2x}+3e^{x}

One hundred grams of cane sugar in water are being converted into dextrose at a rate which is proportional to the amount unconverted. Find the differential equation expressing the rate of conversion after t minutes
\[y=\frac{dq}{dt}=K(100-q)\]

The order of differential equation \[\frac{d ^{2} y}{dx^{2}}+2\frac{dy}{dx}\frac{d^{3} y}{dx^{3}}+x=0\] is _____
2

The degree of differention equation \[\left(\frac{d^{3}y}{dx^{3}}\right)^{2}+2\frac{d^{2}y}{dx^{2}}-\frac{dy}{dx}+x^{2}\left(\frac{dy}{dx}\right)^{3}=0\] is _____
2

Find the general solution of \(y'+2y=x^3 e^{-2x}\)
\(y=e^{-2x} (x^{4/4}+c)\)

Find the solution of the initial value problem \(dy/dx=12x^3-2 \sin? x\), y(0)=3
\(y=3x^4+2 \cos? x+1\)

Solve the initial value problem \((\cos? x \sin? x-xy^2)dx+y(1- x^2 y)dy=0\), y(0)=2
\(y^2 (1-x^2)-\cos^2? x=c\)

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Which of the following differential equations are seperable (i) $\frac{dy}{dx}=xy$ (ii) $\frac{dy}{dx}=x+y$ (iii) $\frac{dy}{dx}=xy+y$
Equations (i) and (iii) only

Obtain the solution of the equation$ xy'=4y$
$y=cx^4$

Solve the equation dy/dx=sin?5x
y=-1/5 cos?5x+c

The solution of the initial value problem dy/dx=-x/y, y(4)=3 is
$x^2+y^2=25$

Find the distance which an object falls under gravity in t seconds if it starts from rest
$x=1/2 gt^2$

Solve $\frac{ d y}{dx}+\frac{1}{2}y=\frac{3}{2}$with y(0)=2
$y=3-e^\frac{1}{2}x$

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The degree of differention equation $\left(\frac{d^{3}y}{dx^{3}}\right)^{2}+2\frac{d^{2}y}{dx^{2}}-\frac{dy}{dx}+x^{2}\left(\frac{dy}{dx}\right)^{3}=0$ is _____
2

The order of differential equation $\frac{d ^{2} y}{dx^{2}}+2\frac{dy}{dx}\frac{d^{3} y}{dx^{3}}+x=0$ is _____
2

One hundred grams of cane sugar in water are being converted into dextrose at a rate which is proportional to the amount unconverted. Find the differential equation expressing the rate of conversion after t minutes.
$y=\frac{dq}{dt}=K(100-q)$

Solve the initial value problem $\frac{d^{2} y}{d x^{2}}+\frac{d y}{d x}-2y=0 y(0)=2, \frac{d y}{ dx} (0)=5$
$ y=-e^{2x}+3e^{x}$

Solve the differential equation $\frac{d^{2} y}{d x^{2}}+\frac{d y}{d x}-2y=x^{2}$
$y=A e^{-2x}+ B e^{x}-\frac{1}{2}x^{2}-\frac{1}{2}{x-}-\frac{3}{4}$

Solve the equation damped simple harmonic motion $\frac{ d^{2} y}{d x^{2}}+ 4y=0$
$y=e^{-x}(A\cos 2x +B\sin 2x)$

Solve the equation undamped simple harmonic motion $\frac{ d^{2} y}{d x^{2}}+ 4y=0$
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Solve the second order differential equation $\frac{d^{2} y}{d x^{2}}+\frac{d y}{d x}-2y=0$
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Solve the general solution of $\frac{d y}{ d x }=e^{x}+x+sinx $
$y=c e^{-x}\frac{1}{2} e^{x}+x-1+\frac{1}{2}(sin x - cos x)$

Find the complete solution of $\left(D^{4}-8D^{2}+16\right)y=0$
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Solve the equation $x\frac{dy}{dx}-ay=x+1$, where a is a constant
$y=\frac{x}{1-a}-\frac{1}{a}+cx$

Find the general solution $\frac{dy}{dx}=\frac{2y^{2}+3xy}{x^{2}}$
$tan^{-1} x+ tan^{-1} y=-\frac{\pi}{4}$

Solve the differential equation$y'=x(1+y^{2})$
$y=tan \left(\frac{x^{2}}{2}+c\right)$

Obtain the solution for the initial value problem $y'+(cot x)y=x csc x, y\left(\frac{\pi}{2}\right)=1$
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If $y=2x+Ce^{x}$ is a solution of the differential equation$\frac{d y} {d x}-y=2(1-x)$ then find the particular solution satified by x=0, y=3
$y=2x+3e^{x}$
Use seperable method to solve the differential equation $$\frac{dy}{dx}=xy$$
$A e^{\frac{x^{2}}{2}}$

Using integrating factor, solve the differential equation $\frac{d y}{dx}+y=e^{x}$
$y=\frac{1}{2}e^{x}+c e^{-x}$

Solve the equation $ y'=x(1+y^2)$ by using variable separable
$y=tan?(x^{2}/2+c)$

The general solution of the equation is $y'+(\cot? x)y?=x \csc ?x$
$\frac{x^2}{2 \sin x} +\frac{c}{\sin? x}$

Which of equations described Newton's law of cooling which state that the rate of change with respect to time t of the temperature T(t) of a body is proportional to difference between T and the temperature A of the surrounding medium
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Find the general solution of $y'+2y=x^3 e^{-2x}$
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Find the solution of the initial value problem $dy/dx=12x^3-2 \sin? x$, y(0)=3
$y=3x^4+2 \cos? x+1$

Solve the initial value problem $ (\cos? x \sin? x-xy^2)dx+y(1- x^2 y)dy=0$, y(0)=2
$y^2 (1-x^2)-\cos^2? x=c$

The theory of differential equations involves the interplay of _____ and their derivatives.
Function

An equation involving one (or more) dependent variable derivatives with respect to one or more ---------- variables is called a differential equation.
Independent

Dy/dx=2y-2x2+3 is an example of _____ differential equation
Ordinary

Isaac Newton was able to model the motion of a particle by an equation involving an unknown function and one or more of its_____

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Derivative

Given a function of two variables z=fx, y; ðzðx is the _____ partial derivative of z with respect to x and it is obtained by differentiating z with respec
first order

Given a function of two variables z=fx, y; ðzðy is the first order partial derivative of z with respect to y and it is obtained by differentiating z with respect
X

Differential equations are divided into three classes, namely; ordinary, partial and _____
Total

The order of a differential equation is the order of the _____ order derivative appearing in the equation.
Highest

The degree of a differential equation is the highest ---------- of the highest order derivative appearing in it after the equation has been expressed in the form free from radicals and any fractional power of the derivatives or negative power.
Exponent

The equation x-ydydx2=r21+dydx&lt
Three

The equation ð2zðx2+ð2zðy2-ð</mo&g
Partial

The equation dydx=ex+y is a good example of _____ equation.
Separable

The equation dydx=exy is _____ a separable equation.
not

The equation dydx=ex+y _____ a separable equation.
Is

hx, y=x3+2x2y+3xy2+4y3 is _____ of degree
Homogeneous

A differential equation y'=fx,y is called a homogeneous differential equation when f is a homogeneous _____ of degree 0
Function

An exact differential equation is formed by equating an exact differential to _____
Zero

A factor, which when multiplied with a non-exact differential equation makes it _____ , is known as an integrating factor.
Exact

A differential equation is _____ if the dependent variable and all its derivatives appear only in the first degree and also there is no term involving the product of the derivatives or any derivative and the dependent variable.
Linear

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A differential equation is linear if the _____ variable and all its derivatives appear only in the first degree and also there is no term involving the product of the derivatives or any derivative and the dependent variable.
Dependent

Given that dydx+Pxy=Qx is the general form of the linear equation of the first order, where Px and Qx</
non-homogeneous

Given that dydx+Pxy=Qx is the general form of the linear equation of the first order, where Px and Qx</
Homogeneous

Fx,y,c=x+y+c=0 represents a family of _____ straight lines; each line corresponds to precisely one value of the parameter c
Parallel

Fx,y,c=x2+y2+c2=0 represents a family of concentric _____ of radius c with centre at the origin.
Circles

A set of functions y1x,y2x, …,ynx defined on an interval I is linearly _____
Dependent

Method of undetermined coefficients is applicable if the equation is a _____ equation with constant coefficients
Linear

Method of undetermined coefficients is applicable if the _____ term is either a polynomial, an exponential function, a sinusoidal function or a product of these functions
non-homogeneous

If we know one solution of the homogeneous linear differential equation of the second order, we can solve the non-homogeneous equation by the method of _____ and obtain both a particular solution and a second linearly independent solution of the homogeneous equation.
reduction of order

If we know one solution of the homogeneous linear differential equation of the second order, we can solve the non-homogeneous equation by the method of reduction of order and obtain both a particular solution and a second linearly independent solution of the _____ equation.
Homogeneous

The differential equation x3d3ydx3+x2d2ydx&lt
Euler's

The three classes of differential equation are; ordinary, total and _____
Partial

Given y2∂z∂x+xy∂z∂x=nzx; ∂z∂x is a _____ derivative of <math xmlns="h
Partial

Given y2∂z∂x+xy∂z∂x=nzx; ∂z∂y is a partial derivative of <math xmlns="http/
X

The partial derivatives of a function of two variables z=fx, y with respect to one of the _____ variables x, can be defined as ∂z∂x=∂f∂x

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Independent

The partial derivatives of a function of two variables z=fx, y with respect to one of the independent variables _____ can be defined as ∂z∂x=∂f∂x.
X

Given a function of two variables z=fx, y; ∂z∂x is the first order partial derivative of z with respect to x and it is obtained by differentiating z with respect
Constant

The most obvious classification of differential equations is based on the _____ of the dependent variable and its derivative (or derivatives) in the equation.
Nature

The most obvious classification of differential equations is based on the nature of the dependent _____ and its derivative(or derivatives) in the equation.
Variable

_____ differential equation is the equation involving only derivatives (that is , derivatives with respect to a single independent variable)
Ordinary

If y=fx is a given function then its derivation dydx can be interpreted as the rate of change of _____ with respect to x
Y

The primary purpose of differential equations is to serve as a tool for studying _____ in the physical world
Change

Sir Isaac Newton observed that certain important laws of natural sciences can be phrased in terms of _____ involving rates of change.
Equations

_____ differential equation is the equation containing partial derivatives of one (or more) dependent variable with respect to two or more independent variable.
Partial

Partial differential equation is the equation containing partial derivatives of one (or more) dependent variable with respect to two or more _____ variable.
Independent

The _____ of a differential equation is the order of the highest order derivative appearing in the equation.
Order

The differential equation d2ydx2+y=x2 is of _____ order
Two

The equation x-ydydx2=r21+dydx&lt
Four

The equation, x+y2dydx=1 , is a/an _____ non-linear equation.
Ordinary

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The equation ∂2z∂x2+∂2z∂y2-∂</mo&g
Partial

In differential equation, a particular solution is any solution which is obtained from the _____ by giving particular values to the arbitrary constants.
general solution

If y=fx is a given function then its derivation dydx can be interpreted as the rate of change of ---------- with respect to x
f

The primary purpose of differential equations is to serve as a tool for studying -------in the physical world
change

Sir Isaac Newton observed that certain important laws of natural sciences can be phrased in terms of -------involving rates of change.
equations

Isaac Newton was able to model the motion of a particle by an equation involving an unknown function and one or more of its------
directions

The theory of differential equations involves the interplay of ------- and their derivatives.
derivatives

An equation involving one (or more) dependent variable derivatives with respect to one or more independent variables is called a ----------
simultaneous equation

dydx=2y-2x2+3 is an example of ----------differential equation
partial

Given y2∂z∂x+xy∂z∂x=nzx; ∂z∂x is a --------- derivative of <math xmlns="http
differential

Given y2∂z∂x+xy∂z∂x=nzx; ∂z∂y is a partial derivative of <math xmlns="http/
x

The partial derivatives of a function of two variables z=fx, y with respect to one of the independent variables x, can be defined as ----------
∂x∂y=∂y∂x

Given a function of two variables z=fx, y; ∂z∂x is the first order partial derivative of z with respect to x and it is obtained by differentiating z with respect
constant

If z=fx, y is a function of two variables, then ∂z∂y is the first order partial derivative of z with respect to y and it is obtained by differentiating z with r
f

The most obvious classification of differential equations is based on the nature of the ---------- variable and its derivative(or derivatives) in the equation.
independent

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A differential equation involving only derivatives (that is , derivatives with respect to a single independent variable) is called an ---------- differential equation.
partial

Differential equation containing partial derivatives of one (or more) dependent variable with respect to two or more independent variable is called a ---------- differential equation.
total

The ---------- of a differential equation is the order of the highest order derivative appearing in the equation.
power

The differential equation d2ydx2+y=x2 is of ---------- order
Zero

The equation, x+ydydx2=1 is of ---------- order
Zero

The ---------- of a differential equation is the highest exponent of the highest order derivative appearing in it after the equation has been expressed in the form free from radicals and any fractional power of the derivatives or negative power.
Power

The equation x-ydydx2=r21+dydx&lt
Three

When in an ordinary or partial differential equation, the dependent variables and its derivatives occur to the degree only, and not as higher powers or products, we call the equation ----------
Non-linear

The differential equation d2ydx2+y=x2 is an ordinary ----------differential equation.
non-linear

The equation, x+y2dydx=1 , is an ordinary ---------- equation
non-linear

The equation ∂2z∂x2+∂2z∂y2-∂</mo&g
non-exact

The solution of the nth order differential equation with arbitrary 'n' constants is called its ---------solution.
particular

In differential equation, any solution which is obtained from the general solution by giving particular values to the arbitrary constants is called a ---------- solution.
particular

The general solution of a first order differential equation normally contains one arbitrary constant which is called a ----------
constant

Y=mx+c is a -----parameter family of cueves
one

Which of the following does not indicate situation(s) where differential equations occur naturally ----------
solving differential equation

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Conditions on the value of the dependent variable, and its derivative, at a single value of the independent variable in the interval of existence of the solution are called the ----------
general conditions

The problem of solving a differential equation together with the initial conditions is called the ----------
general condition

The general solution of a ---------- differential equation represents one-parameter family of curves.
second order

The general solution of a nth order differential equation represents ---------- family of curves.
nm-parameter

Many physical situation such as population mode, Newton's law of cooling, radioactive decay, can be represented by ---------- differential equations
second order

An equation of the form dydx=fx, y is called a ---------- if fx, y can be put in the form fx, y&lt
separable equation

An equation of the form dydx=fx, y is called equation in variable separable form if fx, y can be put in the form ---------- where X and <mi&
fx, y=XYy

A real-value function hx, y of two variables x and y is called a ----------function of degree n, where n is a real number, if we have hλx, <
homogeneous

The function hx, y=x3+2x2y+3xy2+4y3 is homogeneou
three

A differential equation y'=fx,y is called a homogeneous differential equation when f is a homogeneous function of ----------
degree 1

An exact differential ---------- is formed by equating an exact differential to zero
inequality

A factor, which when multiplied with a non-exact differential equation makes it exact, is known as an ----------factor.
exact

A differential equation is ---------- if the dependent variable and all its derivatives appear only in the first degree and also there is no term involving the product of the derivatives or any derivative and the dependent variable.
non-linear

--------- differential equations can be applied in population model, radioactive decay and Newton's law of cooling.
non-linear

Given that dydx+Pxy=Qx is the general form of the linear equation of the first order, where Px and Qx</
homogeneous

Given that dydx+Pxy=Qx is the general form of the linear equation of the first order, where Px and Qx</

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homogeneous

px+px+py+xy=0 is equivalent to ----------
p-xp+y=0.

Fx,y,c=x+y+c=0 represents a family of ---------- lines; each line corresponds to precisely one value of the parameter c
parallel circles

Fx,y,c=x2+y2+c2=0 represents a family of ---------- of radius c with centre at the origin.
parallel circles

A set of functions y1x,y2x, …,ynx defined on an interval I is ----------if fo
linearly non-homogeneous

Method of undetermined coefficients is applicable if the equation is a ---------- equation with constant coefficients
non-linear

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