

## MTH401 Grand quiz 2020 (Spring)

MTH401:Grand Quiz	Quiz Start Time: 08:01 AM, 06 July 2020
Question # 1 of 30 ( Start time: 08:01:15 AM, 06 July 2020 )	Total Marks: 1
The gravitational force exerted by the earth on a body of mass $m$ is called ----- of the body.	
Select the correct option	
<input type="radio"/>	Force
<input type="radio"/>	weight

The differential equation

$$\frac{du}{dx} + \frac{2}{x}u = 3 - \frac{6}{x}$$

Select the correct option

[Reload Math Equations](#)

$\frac{1}{x}$



$x^2$



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



$-\frac{1}{x}$

Question # 3 of 30 ( Start time: 08:01:43 AM, 06 July 2020 )

Total Marks: 1

If the auxiliary equation  $m^3 + m = 0$  has roots  $m = 0, m = \pm i$  then the complementary function is

Select the correct option

[Reload Math Equations](#)

$y_c = c_1 + c_2 \cos x + c_3 \sin x$



$y_c = c_1 \cos x + c_2 \sin x$

Question # 4 of 30 ( Start time: 08:01:48 AM, 06 July 2020 )

Total Marks: 1

The differential equation

$$\frac{dy}{dx} - y = y^3$$

Select the correct option

[Reload Math Equations](#)

- |                       |             |
|-----------------------|-------------|
| <input type="radio"/> | Bernoulli's |
| <input type="radio"/> | Homogeneous |
| <input type="radio"/> | Cauchy      |
| <input type="radio"/> | Bessel      |

Question # 6 of 30 ( Start time: 08:02:26 AM, 06 July 2020 )

Total Marks: 1

What is annihilator operator of the function

$$g(x) = 4 \sin x$$

?

Select the correct option

[Reload Math Equations](#)

- |                       |             |
|-----------------------|-------------|
| <input type="radio"/> | $(D^2 - 1)$ |
| <input type="radio"/> | $(D^2 + 4)$ |
| <input type="radio"/> | $(D^2 - 4)$ |
| <input type="radio"/> | $(D^2 + 1)$ |

The differential equation  $(\sin 2x - \tan y)dx - x\sec^2 y dy = 0$  is exact because - - - - -.

Select the correct option

[Reload Math Equations](#)

<input checked="" type="radio"/>	$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x} = -\sec^2 y$
<input type="radio"/>	$\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y} = -\sec^2 y$
<input type="radio"/>	$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x} = \sec^2 y$
<input type="radio"/>	$\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y} = \sec^2 y$

Which of the following is first order linear equation in unknown variable  $y$ ?

Select the correct option

[Reload Math Equations](#)

<input type="radio"/>	$x \frac{dy}{dx} + (\sin x) y = \cos x$
<input type="radio"/>	$y \frac{dx}{dy} + (\sin y) x = \cos y$
<input type="radio"/>	$y \frac{dx}{dy} + (\sin y) x = \cos x$
<input type="radio"/>	$y \frac{dx}{dy} + (\sin x) x = \cos y$

Question # 10 of 30 ( Start time: 08:03:06 AM, 06 July 2020 )

Total Marks: 1

If initial amount of a radioactive isotope is 100g. What will be the amount at the end of 30 days such that  $K=0.0437$ ?

Select the correct option

- |                       |         |
|-----------------------|---------|
| <input type="radio"/> | 371.415 |
| <input type="radio"/> | 380.560 |
| <input type="radio"/> | 363.279 |
| <input type="radio"/> | 360.351 |

Question # 11 of 30 ( Start time: 08:03:13 AM, 06 July 2020 )

Total Marks: 1

For  $f(x, y) = x^2 - y^2$ ,  $f(tx, ty) = \dots$

Select the correct option

[Reload Math Equations](#)

- |                       |              |
|-----------------------|--------------|
| <input type="radio"/> | $f(x, y)$    |
| <input type="radio"/> | $tf(x, y)$   |
| <input type="radio"/> | $t^2f(x, y)$ |
| <input type="radio"/> | $t^3f(x, y)$ |

Question # 12 of 30 ( Start time: 08:03:19 AM, 06 July 2020 )

Total Marks: 1

Which of following would be a constant solution of the separable differential equation:  $\frac{dy}{dx} = e^{x+1}$  ?

Select the correct option

[Reload Math Equations](#)

- |                       |                            |
|-----------------------|----------------------------|
| <input type="radio"/> | $y = 0$                    |
| <input type="radio"/> | $y = 1$                    |
| <input type="radio"/> | $y = a \in \mathbb{R}$     |
| <input type="radio"/> | No constant solution exist |

Question # 13 of 30 ( Start time: 08:03:24 AM, 06 July 2020 )

Total Marks: 1

If we substitute

$$u = \frac{y}{x}$$

in differential equation

Select the correct option

[Reload Math Equations](#)

- |                       |                     |
|-----------------------|---------------------|
| <input type="radio"/> | $ue^u du = dx$      |
| <input type="radio"/> | $ue^{(-u)} du = dx$ |
| <input type="radio"/> | $ue^u du = dy$      |
| <input type="radio"/> | $ue^{(-u)} du = dy$ |

Question # 14 of 30 ( Start time: 08:03:34 AM, 06 July 2020 )

Total Marks: 1

Separable form  $g(x)dx + f(y)dy = 0$ , of the differential equation:  $(2x \cos y) dx + x^2 (\sec y - \sin y) dy = 0$  is—.

Select the correct option

[Reload Math Equations](#)

$(\frac{2}{x}) dx + (\cos^2 y - \tan y) dy = 0$

$(\frac{x}{2}) dx + (\sec^2 y - \cot y) dy = 0$

$(\frac{x}{2}) dx + (\sec^2 y - \tan y) dy = 0$

$(\frac{2}{x}) dx + (\sec^2 y - \tan y) dy = 0$

Question # 15 of 30 ( Start time: 08:03:39 AM, 06 July 2020 )

Total Marks: 1

A differential equation  $M(x,y)dx + N(x,y)dy = 0$  is exact if there exists a multi - variable function  $f(x,y)$  such that - - -

Select the correct option

[Reload Math Equations](#)

$df(x,y) = \frac{\partial f}{\partial x} dx + \frac{\partial f}{\partial y} dy$

$\int f(x,y)dx = \int \frac{\partial f}{\partial x} dx + \int \frac{\partial f}{\partial y} dy$

$f(x,y) = \frac{\partial f}{\partial x} dx + \frac{\partial f}{\partial y} dy$

$f(x,y) = \int \frac{\partial f}{\partial x} dx + \int \frac{\partial f}{\partial y} dy$

$\frac{d^4y}{dx^4} + y^4 = 0$  is a ———differential equation of order——.

Select the correct option

[Reload Math Equations](#)

- |                       |               |
|-----------------------|---------------|
| <input type="radio"/> | linear, 4     |
| <input type="radio"/> | linear, 3     |
| <input type="radio"/> | non-linear, 4 |
| <input type="radio"/> | non-linear, 3 |

Which of the following is an equivalent form of the exact differential equation:  
 $ydx + xdy = 0$ ?

Select the correct option

[Reload Math Equations](#)

- |                       |                                 |
|-----------------------|---------------------------------|
| <input type="radio"/> | $d\left(\frac{x}{y}\right) = 0$ |
| <input type="radio"/> | $d\left(\frac{y}{x}\right) = 0$ |
| <input type="radio"/> | $d(xy) = 0$                     |
| <input type="radio"/> | $d(x + y) = 0$                  |



Question # 18 of 30 ( Start time: 08:03:59 AM, 06 July 2020 )

Total Marks: 1

$$\frac{dy}{dx} - \frac{1}{xy} = xy^3$$

Identify

Select the correct option

Reload Math Equations



$$\frac{1}{x}, x < 3$$



$$y, xy^2 < 3$$



$$-y, xy^3 < 3$$



$$-\frac{1}{x}, x < 3$$

Question # 19 of 30 ( Start time: 08:05:08 AM, 06 July 2020 )

Total Marks: 1

The differential equation of orthogonal trajectory to the family of curves

$$x^2 + y^2 = C^2$$

is \_\_\_\_\_

Select the correct option

Reload Math Equations



$$\frac{dy}{dx} = \frac{x}{y}$$



$$\frac{dy}{dx} = \frac{y}{x}$$



$$\frac{dy}{dx} = -\frac{x}{y}$$



$$\frac{dy}{dx} = -\frac{y}{x}$$

Question # 20 of 30 ( Start time: 08:05:17 AM, 06 July 2020 )

Total Marks: 1

If the general solution of a separable differential equation is  $\sin^{-1} y = \cos^{-1} x + c$ , provided that  $y(\frac{1}{\sqrt{2}}) = \frac{1}{\sqrt{2}}$ , then  $c = \dots$ .

Select the correct option

[Reload Math Equations](#)

- $\frac{\pi}{4}$
- $\frac{\pi}{2}$
- $-\frac{\pi}{4}$
- 0

[Click to Save Answer & Move to Next Question](#)

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Question # 21 of 30 ( Start time: 08:05:22 AM, 06 July 2020 )

Total Marks: 1

The equation of free un-damped motion is \_\_\_\_\_.

Select the correct option

[Reload Math Equations](#)

- $\frac{d^2x}{dt^2} + \frac{k}{m}x = 0$
- $\frac{d^2x}{dt^2} - \frac{k}{m}x = 0$

Question # 22 of 30 ( Start time: 08:05:35 AM, 06 July 2020 )

Total Marks: 1

Which of the following is a boundary value problem(BVP)?

Select the correct option

[Reload Math Equations](#)

- |                       |   |
|-----------------------|---|
| <input type="radio"/> | $\frac{d^2y}{dx^2} + y = 0$   |
| <input type="radio"/> | $\frac{d^2y}{dx^2} + y = 0, x \in [-2, 2]$                                  |
| <input type="radio"/> | $\frac{d^2y}{dx^2} + y = 0, y(1) = -2$ and $y'(1) = 2$                      |
| <input type="radio"/> | $\frac{d^2y}{dx^2} + y = 0, y(0) = 0$ and $y\left(\frac{\pi}{2}\right) = 2$ |

A differential equation  $M(x, y) dx + N(x, y) dy = 0$  is exact if and only if ---.

Select the correct option

[Reload Math Equations](#)

- |                                  |   |
|----------------------------------|---|
| <input checked="" type="radio"/> | $\frac{\partial}{\partial x} M(x, y) = \frac{\partial}{\partial y} N(x, y)$ |
| <input type="radio"/>            | $\frac{\partial}{\partial y} M(x, y) = \frac{\partial}{\partial x} N(x, y)$ |
| <input type="radio"/>            | $\frac{d}{dx} M(x, y) = \frac{d}{dy} N(x, y)$                               |
| <input type="radio"/>            | $\frac{d}{dy} M(x, y) = \frac{d}{dx} N(x, y)$                               |

For 2nd order linear non-homogeneous differential equation

$$a_2(x) \frac{d^2 y}{dx^2} + a_1(x) \frac{dy}{dx} + a_0(x)y = g(x)$$

Select the correct option

[Reload Math Equations](#)

$$y'(a) = y'_0, \quad y(b) = y_1$$

$$y'(a) = y'_0, \quad y'(b) = y'_1$$

$$y'(a) = y'_0, \quad y'(b) = y'_0$$

$$y'(a) = y'_0, \quad y(b) = y_1$$

Wronskian

$$W(1, e^x)$$

= \_\_\_\_\_

Select the correct option

[Reload Math Equations](#)

0

1

-1

 $e^x$

For the non-exact differential equation  $(x^2y + y) dx - xdy = 0$ , if  $\frac{\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x}}{N} = -x$ , then the integrating factor is ---.

Select the correct option

[Reload Math Equations](#)

- |                       |                    |                       |
|-----------------------|--------------------|-----------------------|
| <input type="radio"/> | $e^{\frac{1}{x}}$  |                       |
| <input type="radio"/> | $e^{-\frac{1}{x}}$ | <input type="radio"/> |
| <input type="radio"/> | $e^x$              |                       |
| <input type="radio"/> | $e^{-x}$           |                       |

Question # 27 of 30 (Start time: 06:06:23 AM, 06 July 2020)

Total Marks: 1

Which of following would be a general solution of the differential equation:  $\frac{dy}{dx} = 4?$

Select the correct option

[Reload Math Equations](#)

- |                       |              |                       |
|-----------------------|--------------|-----------------------|
| <input type="radio"/> | $y = 4x + a$ |                       |
| <input type="radio"/> | $y = ax + 4$ |                       |
| <input type="radio"/> | $y = 4x + 4$ | <input type="radio"/> |
| <input type="radio"/> | $y = ax + a$ |                       |

Question # 28 of 30 ( Start time: 08:06:29 AM, 06 July 2020 )

Total Marks: 1

Which of the following substitution will transform the differential equation :  $\frac{dy}{dx} = \frac{y}{x} + \sec\left(\frac{y}{x}\right)$ , in to separable form?

Select the correct option

[Reload Math Equations](#)

- $y = v + x$
- $y = v - x$
- $y = vx$
- $x = vy$

The differential equation  $\frac{dx}{dy} + \frac{1}{y}x = 2 \sin y$  is first order linear in unknown ---

Select the correct option

[Reload Math Equations](#)

- variable x
- variable y
- multi - variables x and y
- $\frac{dy}{dx}$

MTH401: Grand Quiz Quiz Start Time: 08:01 AM, 06 July 2020

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Question # 7 of 30 ( Start time: 08:02:32 AM, 06 July 2020 ) Total Marks: 1

Separable form  $f(y)dy = g(x)dx$ , of the differential equation  $y - x \frac{dy}{dx} = a \left( y^2 + \frac{dy}{dx} \right)$  is—.

Select the correct option Reload Math Equations

<input type="radio"/>	$\frac{1}{y(1+ay)} dy = \frac{1}{x+a} dx$
<input type="radio"/>	$\frac{1}{y(1-ay)} dy = \frac{1}{x+a} dx$
<input type="radio"/>	$\frac{1}{y(1+ay)} dy = \frac{1}{x-a} dx$
<input type="radio"/>	$\frac{1}{y(1-ay)} dy = \frac{1}{x-a} dx$

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Question # 1 of 30 ( Start time: 04:56:22 AM, 06 July 2020 )

If

$$y = c_1 e^{(2+\sqrt{6})x} + c_2 e^{(2-\sqrt{6})x}$$

is the complementary solution of

Select the correct option

<input type="radio"/>	$Ax + B$
<input type="radio"/>	$Ax^2 + Bx + C$
<input type="radio"/>	$Ax^3 + Bx^2 + Cx + D$
<input type="radio"/>	$(Ax^2 + Bx)2x^2$

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Question # 2 of 30 ( Start time: 04:58:21 AM, 06 July 2020 )

The periodic time is given by

Select the correct option

<input type="radio"/>	$\frac{\omega}{2\pi}$
<input type="radio"/>	$\frac{2\pi}{\omega}$
<input type="radio"/>	$2\pi \times \omega$
<input type="radio"/>	$\frac{\pi}{\omega}$

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Question # 3 of 30 ( Start time: 04:59:24 AM, 06 July 2020 )

The hook's law states that the force  $F$  is proportional to the \_\_\_\_\_

Select the correct option

<input type="radio"/>	Length
<input type="radio"/>	Elongation
<input type="radio"/>	Weight
<input type="radio"/>	None of these

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Question # 4 of 30 ( Start time: 04:59:58 AM, 06 July 2020 )

If  $x^2y^2dx + x^2y^2dy = 0$  has the equivalent form as  $d\left(\frac{1}{3}x^2y^3\right) = 0$ , then its solutions are ----.

Select the correct option

$x^2 + y^3 = c$

$x^2 - y^3 = c$

$x^2y^3 = c$

$\frac{x^2}{y^3} = c$

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Question # 5 of 30 ( Start time: 05:00:57 AM, 06 July 2020 )

Which of the following function would satisfy:  $\frac{dy}{dx} = \frac{dy}{dx} = \dots = \frac{dy}{dx}$ ?

Select the correct option

$y = Ax^2$

$y = Ax^2e^x$

$y = Ax^2$

$y = Ax^2e^x$

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Question # 6 of 30 ( Start time: 05:02:04 AM, 06 July 2020 )

The differential equation

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

Select the correct option

Bernoulli's

Homogeneous

Cauchy

Bessel

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Question # 7 of 30 ( Start time: 05:02:40 AM, 06 July 2020 )

If the auxiliary equation  $\$(m^2) + m + 0\$\$  has roots  $\$m = 0, m = -1\$\$  then the complementary function is

Select the correct option

 $\$(y_c) = (c_1) + (c_2)\cos x + (c_3)\sin x\$\$  $\$(y_c) = (c_1)\cos x + (c_2)\sin x\$\$ 

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Question # 8 of 30 ( Start time: 05:04:00 AM, 06 July 2020 )

If

$$y = 2 + x$$

, then which of the following is true for it?

Select the correct option

- Its annihilator operator is D
  - Its annihilator operator is  $D^2$
  - Its annihilator operator is  $D^3$
  - Its annihilator operator is  $D+1$
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Question # 9 of 30 ( Start time: 05:05:24 AM, 06 July 2020 )

How are frequency and period related in simple harmonic motion?

Select the correct option

- They are directly related
  - Their sum is constant
  - They are inversely related
  - None of the above
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Question # 10 of 30 ( Start time: 05:08:43 AM, 06 July 2020 )

Which of the following is an equivalent form of the exact differential equation:  
 $ydx + xdy = 0?$

Select the correct option

<input type="radio"/>	$d\left(\frac{x}{y}\right) = 0$
<input type="radio"/>	$d\left(\frac{y}{x}\right) = 0$
<input type="radio"/>	$d(xy) = 0$
<input type="radio"/>	$d(x + y) = 0$

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Question # 11 of 30 ( Start time: 05:08:09 AM, 06 July 2020 )

Separable form of the differential equation:  $\frac{dx}{x} = y - 1$  is -----, where  $v = y - 1$ .

Select the correct option

<input type="radio"/>	$\frac{dv}{v} = dx$
<input type="radio"/>	$dx = vdv$
<input type="radio"/>	$\frac{dv}{v} = dx$
<input type="radio"/>	$\frac{dv}{v} = \frac{dx}{x}$

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Question # 12 of 30 ( Start time: 05:09:09 AM, 06 July 2020 )

In exponential model for the population growth

$$P(t) = P_0 e^{kt} \quad \text{If } k > 0, \text{ then } \lim_{t \rightarrow \infty} P(t) =$$

Select the correct option

- 0
- 1
- $\infty$
- $-\infty$

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Question # 13 of 30 ( Start time: 05:10:32 AM, 06 July 2020 )

If initial amount of a radioactive isotope is 100g. What will be the amount at the end of 30 days such that  $K=0.043$ ?

Select the correct option

- 371.415
- 380.560
- 363.279
- 360.351

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Question # 14 of 30 ( Start time: 05:11:58 AM, 06 July 2020 )

Which of the following is a boundary value problem(BVP)?

Select the correct option

$$\frac{d^2y}{dx^2} + y = 0$$

$$\frac{d^2y}{dx^2} + y = 0, x \in [-2, 2]$$

$$\frac{d^2y}{dx^2} + y = 0, y(1) = -2 \text{ and } y'(1) = 2$$

$$\frac{d^2y}{dx^2} + y = 0, y(0) = 0 \text{ and } y\left(\frac{\pi}{2}\right) = 2$$

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Question # 15 of 30 ( Start time: 05:12:23 AM, 06 July 2020 )

 $\frac{d^2x}{dt^2} + 5\left(\frac{dx}{dt}\right)^3 - 3y = e^{3ix}$  is an example of ----- differential equation.

Select the correct option

ordinary linear

ordinary non-linear

partial linear

partial non-linear

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Question # 16 of 30 ( Start time: 05:13:40 AM, 06 July 2020 )

The integrating factor for the first order linear differential equation :  $\frac{dy}{dx} + y \cot x = \sin^2 x$  is ---

Select the correct option

 $\sin x$  $\cos x$  $e^{\sin x}$  $e^{\cos x}$ 

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Question # 17 of 30 ( Start time: 05:15:01 AM, 06 July 2020 )

What is annihilator operator of the function

$$y(x) = 4 \sin x$$

?

Select the correct option

 $(D^2 - 1)$  $(D^2 + 4)$  $(D^2 - 4)$  $(D^2 + 1)$ 

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Question # 18 of 30 ( Start time: 05:16:39 AM, 06 July 2020 )

Which of following are explicit solutions of the differential equation:  $\frac{dy}{dx} = -\frac{x}{y}$ .

Select the correct option

$y = \pm\sqrt{4+x}$

$y = \pm\sqrt{-4+x^2}$

$y = \pm\sqrt{4-x^2}$

$y = \pm\sqrt{-4-x^2}$

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Question # 19 of 30 ( Start time: 05:18:25 AM, 06 July 2020 )

Classify the following differential equation

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

Select the correct option

Separable and not linear

Linear and not separable

Both separable and linear

Neither separable nor linear

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Question # 20 of 30 ( Start time: 05:19:29 AM, 06 July 2020 )

$$\text{For } f(x, y) = \frac{2x}{3y} + 7, f(tx, ty) = \dots$$

Select the correct option

<input checked="" type="radio"/>	$f(x, y)$
<input type="radio"/>	$tf(x, y)$
<input type="radio"/>	$t^2f(x, y)$
<input type="radio"/>	$t^3f(x, y)$

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Question # 21 of 30 ( Start time: 05:20:58 AM, 06 July 2020 )

The family of parabolas  $y^2 = 4ax$  are solutions of the differential equation:  $\frac{dy}{dx} = \frac{2a}{y}$  for ---- value(s) of  $a$ .

Select the correct option

<input type="radio"/>	infinite
<input type="radio"/>	finite
<input type="radio"/>	unique
<input type="radio"/>	no

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Question # 22 of 30 ( Start time: 05:22:15 AM, 06 July 2020 )

The differential equation of orthogonal trajectory to the family of curves

$$x - 2y = c$$

is

Select the correct option



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



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



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



$$\frac{dy}{dx} = -2$$

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Question # 23 of 30 ( Start time: 05:23:30 AM, 06 July 2020 )

Which of the following is first order linear equation in unknown variable  $y$ ?

Select the correct option

- |                       |   |
|-----------------------|---|
| <input type="radio"/> | $x \frac{dy}{dx} + (\sin x) y = \cos x$ |
| <input type="radio"/> | $y \frac{dx}{dy} + (\sin y) x = \cos y$ |
| <input type="radio"/> | $y \frac{dx}{dy} + (\sin y) x = \cos x$ |
| <input type="radio"/> | $y \frac{dx}{dy} + (\sin x) x = \cos y$ |
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Question # 24 of 30 ( Start time: 05:24:23 AM, 06 July 2020 )

Which of following would be a constant solution of the separable differential equation:  $\frac{dy}{dx} = e^{x^2} y$  ?

Select the correct option

- |                       |                            |
|-----------------------|----------------------------|
| <input type="radio"/> | $y = 0$                    |
| <input type="radio"/> | $y = 1$                    |
| <input type="radio"/> | $y = a \in \mathbb{R}$     |
| <input type="radio"/> | No constant solution exist |
- Raza Academy

Question # 25 of 30 ( Start time: 05:25:43 AM, 06 July 2020 )

The leading coefficient in the differential equation

$$3x \frac{d^2 y}{dx^2} - 7x \frac{dy}{dx} + 5y = 0$$

Select the correct option

 3 7 5 -7

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Question # 26 of 30 ( Start time: 05:27:24 AM, 06 July 2020 )

If the general solution of a separable differential equation is  $\sin^{-1} y = \cos^{-1} x + c$ , provided that  $y(\frac{1}{\sqrt{2}}) = \frac{1}{\sqrt{2}}$ , then  $c = \dots$ 

Select the correct option

  $\frac{\pi}{2}$   $\frac{\pi}{4}$   $-\frac{\pi}{4}$  0

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Question # 27 of 30 ( Start time: 05:29:12 AM, 06 July 2020 )

Which of following is an implicit solution of the differential equation:  $\frac{dy}{dx} = -\frac{x}{y}$ .

Select the correct option

$x + y + 4 = 0$

$x^2 + y^2 - 4 = 0$

$x^2 - y^2 + 4 = 0$

$x^2 - y^2 - 4 = 0$

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Question # 28 of 30 ( Start time: 05:31:18 AM, 06 July 2020 )

Wronskian of 1 and  $x^2$ ,  $W(1, x^2) = \underline{\hspace{2cm}}$ 

Select the correct option

0

2x

x

None of these

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Question # 29 of 30 ( Start time: 05:31:47 AM, 06 July 2020 )

For the non - exact differential equation  $M(x, y)dx + N(x, y)dy = 0$ , if  $\frac{\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x}}{N}$  is a function of  $x$ , then the integrating factor is

Select the correct option

- function of  $x$  also
- function of  $y$
- multi - variable function of both  $x$  and  $y$
- constant

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Question # 30 of 30 ( Start time: 05:33:00 AM, 06 July 2020 )

If 2,3,5 are real roots of a differential equation, then the general solution is \_\_\_\_\_.

Select the correct option

- $y = c_1 e^{2x} + c_2 e^{3x} + c_3 e^{5x}$
- $y = c_1 e^{2x} + c_2 e^{-3x} + c_3 e^{5x}$
- $y = c_1 e^{2x} + c_1 e^{-3x} + c_1 e^{5x}$
- $y = \sqrt{(c_1 + c_2 + c_3)} e^{3x} + e^{2x}$

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Made by Ashii

Integrating factor for the first order linear differential equation  $(x-1)^2 \frac{dy}{dx} + 4(x-1)y = \cos x$  is ---

Select the correct option

- |                                  |            |
|----------------------------------|------------|
| <input type="radio"/>            | $e^{-x}$   |
| <input checked="" type="radio"/> | $(x-1)^4$  |
| <input type="radio"/>            | $\ln(x-1)$ |
| <input type="radio"/>            | $e^{x^2}$  |

The differential equation  $\frac{dy}{dx} = \frac{y}{x}$  is ---.

Select the correct option

- |                                  |             |
|----------------------------------|-------------|
| <input checked="" type="radio"/> | Exact       |
| <input type="radio"/>            | Non exact   |
| <input type="radio"/>            | Non linear  |
| <input type="radio"/>            | Inseparable |

The differential equation  $(1 + \ln xy)dx + \left(1 + \frac{x}{y}\right)dy = 0$  is exact because ---

Select the correct option

- |                                  |   |
|----------------------------------|---|
| <input type="radio"/>            | $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x} = \frac{1}{x}$ |
| <input type="radio"/>            | $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y} = \frac{1}{y}$ |
| <input checked="" type="radio"/> | $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x} = \frac{1}{y}$ |
| <input type="radio"/>            | $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y} = \frac{1}{x}$ |

Which of the following is true about

$$f(x, y) = x^2 - y^2 + 37$$

Select the correct option

- |                                  |                          |
|----------------------------------|--------------------------|
| <input checked="" type="radio"/> | $f(x, y) \neq f^2(x, y)$ |
| <input type="radio"/>            | $f(x, y) = f^2(x, y)$    |
| <input type="radio"/>            | $f(x, y) = -f^2(x, y)$   |
| <input type="radio"/>            | $f(x, y) = f(f(x, y))$   |

Which of the following are explicit solutions of the differential equation  $\frac{dy}{dx} = -\frac{x}{y}$ .

Select the correct option

- |                                  |                        |
|----------------------------------|------------------------|
| <input type="radio"/>            | $y = \pm\sqrt{4+x}$    |
| <input type="radio"/>            | $y = \pm\sqrt{-4+x^2}$ |
| <input checked="" type="radio"/> | $y = \pm\sqrt{4-x^2}$  |
| <input type="radio"/>            | $y = \pm\sqrt{-4-x^2}$ |

Which of the following substitution will transform the differential equation:  $\frac{dy}{dx} = \frac{y}{x} + \sec\left(\frac{y}{x}\right)$ , in to separable form?

Select the correct option

- |                                  |             |
|----------------------------------|-------------|
| <input type="radio"/>            | $y = v + x$ |
| <input type="radio"/>            | $y = v - x$ |
| <input checked="" type="radio"/> | $y = vx$    |
| <input type="radio"/>            | $x = vy$    |



$\frac{dy}{dx} + 5\left(\frac{dy}{dx}\right)^2 - 3y = e^{2x}$  is an example of \_\_\_\_\_ differential equation.

Select the correct option

- ordinary linear
- ordinary non-linear
- partial linear
- partial non-linear

$\frac{dy}{dx} + 5\left(\frac{dy}{dx}\right)^2 - 3y = e^{2x}$  is an example of \_\_\_\_\_ differential equation.

Select the correct option

- ordinary linear
- ordinary non-linear
- partial linear
- partial non-linear

An  $n$ -variable function  $f(x, y)$  is said to be homogeneous if  $f(tx, ty) = t^n f(x, y)$ , where  $n \in \dots$ .

Select the correct option

Reload Math

$\mathbb{N}$  = Set of naturals

$\mathbb{Z}$  = Set of integers

$\mathbb{Q}$  = Set of Rationals

$\mathbb{R}$  = Set of Reals

Separable form of the differential equation  $\frac{dy}{dx} = y - 1$  is  $\dots$ , where  $v = y - 1$ .

Select the correct option

$$\frac{dy}{y} = dx$$

$$dx = v dv$$

$$\frac{dv}{v} = dx$$

$$\frac{dv}{v} = \frac{dy}{y}$$



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$$\text{For } f(x, y) = x^2y - xy^2, f(tx, ty) = \dots$$

Select the correct option

Reveal Hint

- $f(x, y)$
- $tf(x, y)$
- $t^2f(x, y)$
- $t^3f(x, y)$

$$\text{For the non-exact differential equation } (x^2y + y) dx - xdy = 0, \text{ if } \frac{\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x}}{N} = -x, \text{ then the integrating factor is } \dots$$

Select the correct option

Reveal Hint

- $e^{\frac{1}{2}x}$
- $e^{-\frac{1}{2}x}$
- $e^x$
- $e^{-x}$

Separable form  $f(y)dy + g(x)dx = 0$ , of the differential equation:  $x \sin y dx + (x^2 + 1) \cos y dy = 0$  is—

Select the correct option

$\tan y dy + \frac{x}{x^2+1} dx = 0$

$\cot y dy + \frac{x}{x^2+1} dx = 0$

$\tan y dy + \frac{x}{x^2-1} dx = 0$

$\cot y dy + \frac{x}{x^2-1} dx = 0$

Separable form  $f(y)dy + g(x)dx = 0$ , of the differential equation:  $x \sin y dx + (x^2 + 1) \cos y dy = 0$  is—

Select the correct option

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$\tan y dy + \frac{x}{x^2-1} dx = 0$

$\cot y dy + \frac{x}{x^2-1} dx = 0$

Which of following is an example of Homogeneous function?

Select the correct option

- $f(x, y) = \sin\left(\frac{1}{x}\right)$
- $f(x, y) = \sin\left(\frac{x}{y}\right)$
- $f(x, y) = \sin x$
- $f(x, y) = \sin xy$

The general linear ordinary differential equation of order  $n$  is  $a_n(x)\frac{d^ny}{dx^n} + a_{n-1}(x)\frac{d^{n-1}y}{dx^{n-1}} + \dots + a_1(x)\frac{dy}{dx} + a_0(x)y = 0$ , where ———.

Select the correct option

- $a_0(x) = 0$
- $a_0(x) \neq 0$
- $a_n(x) = 0$
- $a_n(x) \neq 0$



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Which of the following is an initial value problem (IVP)?

Select the correct option

- $\frac{dy}{dx} + y = 0$
- $\frac{dy}{dx} + y = 0, x \in [-2, 2]$
- $\frac{dy}{dx} + y = 0, y(1) = -2$  and  $y'(1) = -2$
- $\frac{dy}{dx} + y = 0, y(0) = -2$  and  $y'(\frac{1}{2}) = -2$

For  $f(x, y) = x^2y - xy^2, f(tx, ty) = \dots$

Select the correct option

- $f(x, y)$
- $t f(x, y)$
- $t^2 f(x, y)$
- $t^3 f(x, y)$

Which of the following is an initial value problem(IVP)?

Select the correct option

$\frac{dy}{dx} + y = 0$

$\frac{dy}{dx} + y = 0, x \in [-2, 2]$

$\frac{dy}{dx} + y = 0, y(1) = -2$  and  $y'(1) = -2$

$\frac{dy}{dx} + y = 0, y(0) = -2$  and  $y'(\frac{1}{2}) = -2$

On comparing the differential equation  $dy = dx$  with standard form of  $M(x,y)dx + N(x,y)dy = 0$ , we obtain ----

Select the correct option

$M(x,y) = N(x,y)$

$|M(x,y)| = |N(x,y)|$

$\frac{\partial M(x,y)}{\partial x} \neq \frac{\partial N(x,y)}{\partial y}$

$\frac{\partial M(x,y)}{\partial y} \neq \frac{\partial N(x,y)}{\partial x}$

The differential equation  $(\sin 2x - \tan y)dx - \sec^2 y dy = 0$  is exact because -----.

Select the correct option

<input checked="" type="radio"/>	$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x} = -\sec^2 y$
<input type="radio"/>	$\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y} = -\sec^2 y$
<input type="radio"/>	$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x} = \sec^2 y$
<input type="radio"/>	$\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y} = \sec^2 y$

Which of the following substitution will transform the differential equation:  $\frac{dy}{dx} = \frac{y}{x} + \sec\left(\frac{y}{x}\right)$ , in to separable form?

Select the correct option

<input type="radio"/>	$y = v + x$
<input type="radio"/>	$y = v - x$
<input checked="" type="radio"/>	$y = vx$
<input type="radio"/>	$x = vy$



The general linear ordinary differential equation of order  $n$  is  $a_n(x)\frac{d^n y}{dx^n} + a_{n-1}(x)\frac{d^{n-1} y}{dx^{n-1}} + \dots + a_2(x)\frac{d^2 y}{dx^2} + a_1(x)\frac{dy}{dx} + a_0(x)y = 0$ , where —.

Select the correct option

Next

- $a_n(x) = 0$
- $a_n(x) \neq 0$
- $a_n(x) = 0$
- $a_n(x) \neq 0$

For the exact differential equation  $(y - 2x - 3) dy = 0$ , if  $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y} = \frac{2}{y}$ , then the integrating factor is —.

Select the correct option

Next

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

Which of following is an example of Homogeneous function?



Select the correct option

- |                                  |  |
|----------------------------------|--|
| <input type="radio"/>            | $f(x, y) = \sin\left(\frac{1}{x}\right)$ |
| <input checked="" type="radio"/> | $f(x, y) = \sin\left(\frac{x}{y}\right)$ |
| <input type="radio"/>            | $f(x, y) = \sin x$                       |
| <input type="radio"/>            | $f(x, y) = \sin xy$                      |

- |                       |                     |
|-----------------------|---------------------|
| <input type="radio"/> | $f(x, y) = \sin xy$ |
|-----------------------|---------------------|

The degree of the differential equation  $\frac{dy}{dx} + 5\left(\frac{dy}{dx}\right)^2 - 3y = e^{2x}$  is—

Select the correct option

- |                                  |   |
|----------------------------------|---|
| <input type="radio"/>            | 0 |
| <input type="radio"/>            | 1 |
| <input type="radio"/>            | 6 |
| <input checked="" type="radio"/> | 3 |

Which of the following would be a particular solution of the differential equation  $\frac{dy}{dx} = -4y$

⋮

Select the correct option

- |                                  |              |
|----------------------------------|--------------|
| <input checked="" type="radio"/> | $y = 4x + a$ |
| <input type="radio"/>            | $y = ax + 4$ |
| <input type="radio"/>            | $y = ax + a$ |
| <input type="radio"/>            | $y = 4x + 4$ |

Integrating factor for the first order linear differential equation :  $(x - 1)^2 \frac{dy}{dx} + 4(x - 1)^2 y = \cos x$  is ----

Select the correct option

- |                                  |                   |
|----------------------------------|-------------------|
| <input type="radio"/>            | $e^{x^2}$         |
| <input checked="" type="radio"/> | $(x - 1)^4$       |
| <input type="radio"/>            | $\ln(x - 1)$      |
| <input type="radio"/>            | $e^{\frac{1}{x}}$ |

Separable form  $f(y)dy + g(x)dx = 0$ , if the differential equation:  $x \sin y dx + (x^2 + 1) \cos y dy = 0$  is—

Select the correct option

$\tan y dy + \frac{x}{x^2+1} dx = 0$

$\cot y dy + \frac{x}{x^2+1} dx = 0$

$\tan y dy + \frac{x}{x^2-1} dx = 0$

$\cot y dy + \frac{x}{x^2-1} dx = 0$



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non-linear 3

Which of the following is a boundary value problem(BVP)?

Select the correct option

$\frac{d^2y}{dx^2} + y = 0$

$\frac{d^2y}{dx^2} + y = 0, x \in [-2, 2]$

$\frac{d^2y}{dx^2} + y = 0, y(1) = -2$  and  $y'(1) = 2$

$\frac{d^2y}{dx^2} + y = 0, y(0) = 0$  and  $y\left(\frac{\pi}{2}\right) = 2$

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