MTH401 GRAND QUIZ

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

- Force
- weight

Question # 2 of 30 (Start time: 08:01:29 AM, 06 July 2020) **Total Marks: 1**

The differential equation

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

Select the correct option

Reload Math Equations

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

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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

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

sec(s)

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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

- Bernoulli's
- Homogeneous
- Cauchy
- Bessel

Question # 5 of 30 (Start time: 08:02:12 AM, 06 July 2020) **Total Marks: 1**

A set of n functions

$$\{f_1(x), f_2(x), f_3(x), \ldots\ldots, f_n(x)\}$$

is _____ if at least one of them can be expressed as a linear combination of the remaining.

Select the correct option

Reload Math Equations

O	linear dependent
O	linear independent

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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

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

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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

- $\frac{1}{y(1+ay)}dy = \frac{1}{x+a}dx$
- $\frac{1}{y(1-ay)}dy = \frac{1}{x+a}dx$
- $\frac{1}{y(1+ay)}dy = \frac{1}{x-a}dx$
- $\frac{1}{y(1-ay)}dy = \frac{1}{x-a}dx$

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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

- $\frac{1}{y(1+ay)}dy = \frac{1}{x+a}dx$
- $\frac{1}{y(1-ay)}dy = \frac{1}{x+a}dx$
- $\frac{1}{y(1+ay)}dy = \frac{1}{x-a}dx$
- $\frac{1}{y(1-ay)}dy = \frac{1}{x-a}dx$

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

Select the correct option

Reload Math Equations

●	$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x} = -\sec^2 y$
○	$\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y} = -\sec^2 y$
○	$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x} = \sec^2 y$
○	$\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y} = \sec^2 y$

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

Select the correct option

Reload Math Equations

○	$x\frac{dy}{dx} + (\sin x)\, y = \cos x$
○	$y\frac{dx}{dy} + (\sin y)\, x = \cos y$
○	$y\frac{dx}{dy} + (\sin y)\, x = \cos x$
○	$y\frac{dx}{dy} + (\sin x)\, x = \cos y$

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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=0.043?

Select the correct option

- 371.415
- 380.560
- 363.279
- 360.351

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Question # 11 of 30 (Start time: 08:03:13 AM, 06 July 2020) — Total Marks: 1

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

Select the correct option

Reload Math Equations

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

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: $\frac{dy}{dx} = e^{x+y}$?

Select the correct option

Reload Math Equations

- $y = 0$
- $y = 1$
- $y = a \in \mathbb{R}$
- No constant solution exist

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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

- $ue^{u}\,du = dx$
- $ue^{(-u)}\,du = dx$
- $ue^{u}\,du = dy$
- $ue^{(-u)}\,du = dy$

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

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

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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

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

Question # 16 of 30 (Start time: 08:03:45 AM, 06 July 2020) Total Marks: 1

$\frac{d^3y}{dx^3} + y^4 = 0$ is a ------differential equation of order----.

Select the correct option

Reload Math Equations

- linear, 4
- linear, 3
- non-linear, 4
- 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

- $d(\frac{x}{y}) = 0$
- $d\left(\frac{y}{x}\right) = 0$
- $d(xy) = 0$
- $d(x + y) = 0$

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

○	$\frac{1}{x}, x\&3$
○	$y, xy^3\&3$
○	$-y, xy^3\&3$
○	$-\frac{1}{x}, x\&3$

Click to Save Answer & Move to Next Question

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

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

Click to Save Answer & Move to Next Question

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 $c = - - -$.

Select the correct option

Reload Math Equations

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

Click to Save Answer & Move to Next Question

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

- $\frac{d^2y}{dx^2} + y = 0$
- $\frac{d^2y}{dx^2} + y = 0, x \in [-2, 2]$
- $\frac{d^2y}{dx^2} + y = 0, y(1) = -2$ and $y'(1) = 2$
- $\frac{d^2y}{dx^2} + y = 0, y(0) = 0$ and $y\left(\frac{\pi}{2}\right) = 2$

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

Select the correct option

Reload Math Equations

- $\frac{\partial}{\partial x}M(x,y) = \frac{\partial}{\partial y}N(x,y)$
- $\frac{\partial}{\partial y}M(x,y) = \frac{\partial}{\partial x}N(x,y)$
- $\frac{d}{dx}M(x,y) = \frac{d}{dy}N(x,y)$
- $\frac{d}{dy}M(x,y) = \frac{d}{dx}N(x,y)$

Saving

Question # 24 of 30 (Start time: 08:05:50 AM, 06 July 2020) Total Marks: 1

For 2nd order linear non-homogeneous differential equation

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

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

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

Select the correct option

Reload Math Equations

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

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Question # 27 of 30 (Start time: 08:06:23 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

○	$y=4x+a$
○	$y=ax+4$
○	$y=4x+4$
○	$y=ax+a$

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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

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

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

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

Question # 29 of 30 (Start time: 08:06:39 AM, 06 July 2020) Total Marks: 1

Wronskian

$$W(x, 2x)$$

=_____.

Select the correct option

Reload Math Equations

- 0
- 1
- -1
- None of these

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

Select the correct option

Reload Math Equations

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