

Question No : 52 of 52

Marks: 5 (Budgeted Time 10 Min)

Let $\vec{r}(t) = t^2 \hat{i} + t \hat{j} + (t^2 - 5) \hat{k}$. Find t , such that $\vec{r}(t)$ and $\vec{r}'(t)$ are perpendicular to each other.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 51 of 52

Marks: 5 (Budgeted Time 10 Min)

If $f(x, y) = (x-4) \ln(xy)$

Find both first order partial derivatives:

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 50 of 52

Marks: 5 (Budgeted Time 10 Min)

Determine whether the following vector field $\vec{F}$ is conservative or not.

$$\vec{F}(x, y, z) = x^2 z \hat{i} + y^2 x \hat{j} + (y + 2z) \hat{k}$$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

Determine the Fourier co-efficient b_n of the periodic function defined below:

$$f(x) = 2x + 1 \quad 0 < x < 2$$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

What is the arc-length of the curve $\vec{r}(t) = 3\cos t \hat{i} + 3\sin t \hat{j}$ when $0 \leq t \leq 2\pi$?

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 47 of 52

Marks: 3 (Budgeted Time 6 Min)

Find the critical point for the given function $f(x, y) = 6x^2 + xy - 2y^2$ along the line $y = 3x + 1$ at which the absolute extrema of the function can occur.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 45 of 52

Marks: 3 (Budgeted Time 6 Min)

Use Wallis sine formula to evaluate: $\int_0^{\frac{\pi}{2}} (\sin^3 x + \sin^4 x) dx$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

Find Laplace transform of the function $F(t)$ if

$$F(t) = e^{2t} \sin 3t$$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 44 of 52

Marks: 2 (Budgeted Time 4 Min)

Find derivative of the following vector-valued function:

$$\vec{r}(t) = e^{t^2} \hat{i} + t^2 \hat{j} + \sec 2t \hat{k}$$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 42 of 52

Marks: 2 (Budgeted Time 4 Min)

Find Laplace transform of the function $F(t)$ if $F(t) = \cos 3t$.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

State the condition when $\iint_R f(x, y) dA = \int_a^b \int_c^d f(x, y) dx dy = \int_a^b \int_c^d f(x, y) dy dx$ where R is the region of integration.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 41 of 52

Marks: 2 (Budgeted Time 4 Min)

Use Wallis sine formula to evaluate: $\int_0^{\frac{\pi}{2}} \sin^4 x \, dx$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 40 of 52

Marks: 1 (Budgeted Time 1 Min)

A function is said to be smooth if it's derivative is _____ on any value of its domain.

Answer (Please select your correct option)

VuAnswers.com

☐ continuous and non zero

☐ piecewise continuous

☐ defined and non zero

☐ differentiable

correct

Made by: Waqar Siddhu

Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

A single curve can be represented by vector valued function(s).

Answer (Please select your correct option)

VuAnswers.com

☐ Two

☐ Infinitely many

☒ Single

correct

☐ Three

Made by: Waqar Siddhu

Question No : 37 of 52

Marks: 1 (Budgeted Time 1 Min)

Given a vector valued function $\vec{r}(t) = \frac{1}{(t-3)}\hat{i} + e^t\hat{j}$ and its anti-derivative $\vec{R}(t) = \ln(t-3)\hat{i} + e^t\hat{j}$, then $\int \vec{r}(t) dt = \dots\dots\dots$

Answer (Please select your correct option)

VuAnswers.com

☐ $\ln(t-3)\hat{i} + e^t\hat{j} + c$

☐ $(t-3)\hat{i} + \frac{e^t}{2}\hat{j} + c$

☐ $(t-3)^{-1}\hat{i} + \frac{e^t}{2}\hat{j} + c$

☐ $\frac{1}{(t-3)}\hat{i} + e^t\hat{j}$

correct

Made by: Waqar Siddhu

Question No : 38 of 52

Marks: 1 (Budgeted Time 1 Min)

For any two vector valued functions $\vec{r}_1(t)$ and $\vec{r}_2(t)$, $\frac{d}{dt}[\vec{r}_1(t) \times \vec{r}_2(t)] = \dots\dots\dots$ where " $\times$ " and " $\cdot$ " represent the cross and dot product respectively.

Answer (Please select your correct option)

VuAnswers.com

☐ $\vec{r}_1 \cdot \frac{d\vec{r}_2}{dt} - \frac{d\vec{r}_1}{dt} \cdot \vec{r}_2$

☐ $\vec{r}_1 \cdot \frac{d\vec{r}_2}{dt} + \frac{d\vec{r}_1}{dt} \cdot \vec{r}_2$

☐ $\vec{r}_1 \times \frac{d\vec{r}_2}{dt} + \frac{d\vec{r}_1}{dt} \times \vec{r}_2$

☐ $\vec{r}_1 \cdot \frac{d\vec{r}_2}{dt} - \frac{d\vec{r}_1}{dt} \times \vec{r}_2$

correct

Made by: Waqar Siddhu

Question No : 36 of 52

Marks: 1 (Budgeted Time 1 Min)

A vector valued function $\vec{r}(t) = x(t)\hat{i} + y(t)\hat{j} + z(t)\hat{k}$ is continuous if

Answer (Please select your correct option)

VuAnswers.com

- ☐ Atleast one of its components is continuous.
- ☐ All of its components are necessarily differentiable.
- ☐ All of its components are continuous.
- ☐ Limit exists for all of its components.

correct

Made by: Waqar Siddhu

Question No : 35 of 52

Marks: 1 (Budgeted Time 1 Min)

For the given vector valued functions $\vec{r}_1(t)$ and $\vec{r}_2(t)$, $\frac{d}{dt}[\vec{r}_1(t) \times \vec{r}_2(t)] = \dots\dots\dots$ where " $\times$ " and " $\cdot$ " represent the cross and dot product respectively.

Answer (Please select your correct option)

VuAnswers.com

☐ $\vec{r}_1 \cdot \frac{d\vec{r}_2}{dt} + \frac{d\vec{r}_1}{dt} \cdot \vec{r}_2$

☐ $\vec{r}_1 \times \frac{d\vec{r}_2}{dt} + \frac{d\vec{r}_1}{dt} \times \vec{r}_2$

☐ $\frac{d\vec{r}_2}{dt} \times \vec{r}_1 + \vec{r}_2 \times \frac{d\vec{r}_1}{dt}$

☐ $\frac{d\vec{r}_2}{dt} \times \vec{r}_1 + \frac{d\vec{r}_1}{dt} \times \vec{r}_2$

Made by: Waqar Siddhu

Question No : 34 of 52

Marks: 1 (Budgeted Time 1 Min)

If $\vec{R}(t)$ is the anti-derivative of a given vector valued function $\vec{r}(t)$ i.e., $\vec{R}'(t) = \vec{r}(t)$ then $\int_a^b \vec{r}(t) dt = \dots\dots\dots$

Answer (Please select your correct option)

VuAnswers.com

☐ $\vec{R}(a) + \vec{R}(b)$

☐ $\vec{R}(b) - \vec{R}(a) + c$ where c is a non-zero constant

correct

☐ $\vec{R}(a) \vec{R}(b)$

☐ $\vec{R}(b) - \vec{R}(a)$

Made by: Waqar Siddhu

Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

The natural domain of a vector valued function is the _____ of the natural domains of its components

Answer (Please select your correct option)

VuAnswers.com

☐ Product

☐ Summation

☒ Union

☐ Intersection

correct

Made by: Waqar Siddhu

Question No : 32 of 52

Marks: 1 (Budgeted Time 1 Min)

The graph of the equation $r = 3\hat{i} - 2\hat{j} - \hat{k}$ is the point.....

Answer (Please select your correct option)

VuAnswers.com

☐ (1, -2, 3)

☒ (3, -2, -1)

correct

☐ (3, 2, 1)

☐ (-3, -2, -1)

Made by: Waqar Siddhu

Question No : 30 of 52

Marks: 1 (Budgeted Time 1 Min)

If $p(r, \theta)$ is a point in polar coordinate system, then r is the distance of p from

Answer (Please select your correct option)

VuAnswers.com

☐ Pole

correct

☐ Imaginary axis

☐ None of these

☐ Polar axis

Made by: Waqar Siddhu

Question No : 31 of 52

Marks: 1 (Budgeted Time 1 Min)

Given the integral $\iint_R f(x,y) dx dy$, after converting to polar coordinates, it will become where $a \leq \theta \leq b$ and $c \leq r \leq d$.

Answer (Please select your correct option)

VuAnswers.com

☐ $\int_a^b \int_c^d f(r, \theta) r dr d\theta$

correct

☐ $\int_a^b \int_c^d f(r, \theta) dr d\theta$

☐ $\int_a^b \int_c^d f(r, \theta) r d\theta dr$

☐ $\int_a^b \int_c^d f(r, \theta) d\theta dr$

Made by: Waqar Siddhu

Question No : 29 of 52

Marks: 1 (Budgeted Time 1 Min)

Polar co-ordinates of a point are $\left(7, \frac{-\pi}{4}\right)$. Which of the following is another possible polar co-ordinates representation of this point?

Answer (Please select your correct option)

VuAnswers.com

☐ $\left(7, \frac{3\pi}{4}\right)$

☐ $\left(-7, \frac{3\pi}{4}\right)$

☐ $\left(-7, \frac{-\pi}{4}\right)$

☐ $\left(7, \frac{-3\pi}{4}\right)$

Made by: Waqar Siddhu

Question No : 27 of 52

Marks: 1 (Budgeted Time 1 Min)

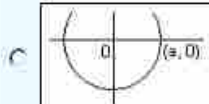
Match the following equation in polar co-ordinates with its graph.

$$r \sin \theta = a$$

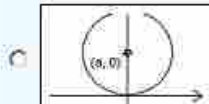
where a is an arbitrary constant

Answer (Please select your correct option)

VuAnswers.com



correct



Made by: Waqar Siddhu

Question No : 28 of 52

Marks: 1 (Budgeted Time 1 Min)

Polar co-ordinates of a point are $(-8, 45^\circ)$. Which of the following is another possible polar co-ordinates representation of this point?

Answer (Please select your correct option)

VuAnswers.com

☐ $(8, 225^\circ)$

☐ $(-8, 225^\circ)$

☐ $(8, 45^\circ)$

☐ $(8, 315^\circ)$

correct

Made by: Waqar Siddhu

Question No : 27 of 52

Marks: 1 (Budgeted Time 1 Min)

Match the following equation in polar co-ordinates with its graph.

$$r \sin \theta = a$$

where a is an arbitrary constant

Answer (Please select your correct option)

VuAnswers.com

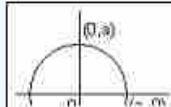
☐



☐



☐



☐



Made by: Waqar Siddhu

Question No : 26 of 52

Marks: 1 (Budgeted Time 1 Min)

If $R = \{(x, y) : 0 \leq x \leq 2 \text{ and } 0 \leq y \leq 3\}$, then $\iint_R (1 - ye^{xy}) dA =$

Answer (Please select your correct option)

VuAnswers.com

☐ $\int_0^2 \int_0^3 (1 - ye^{xy}) dy dx$

correct

☐ $\int_0^2 \int_0^3 (1 - ye^{xy}) dx dy$

☐ $\int_2^3 \int_0^0 (1 - ye^{xy}) dx dy$

☐ $\int_0^2 \int_2^3 (4xe^{2y}) dy dx$

Made by: Waqar Siddhu

Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

Let x, y, z be the length, width and height of an open rectangular box. The surface area of the box will be

Answer (Please select your correct option)

VuAnswers.com

☐

$$A = xy + 2yz + 2xz$$

☐

$$A = yz + 4$$

☐

$$A = xz + yz + zx$$

☐

$$A = xz$$

correct

Made by: Waqar Siddhu

Question No : 24 of 52

Marks: 1 (Budgeted Time 1 Min)

Let x, y, z be the length, width and height of a rectangular box. The area of bottom will be

Answer (Please select your correct option)

VuAnswers.com

☐ $A = yz$

☐ $A = xz$

☐ $A = xy$

correct

☐ $A = xz$

Made by: Waqar Siddhu

Question No : 22 of 52

Marks: 1 (Budgeted Time 1 Min)

Suppose $f(x, y) = x^3 e^{xy}$. Which of the following options is correct?

Answer (Please select your correct option)

VuAnswers.com

☐ $\frac{\partial f}{\partial y} = 3x^2 e^{xy}$

☐ $\frac{\partial f}{\partial y} = x^3 e^{xy}$

☐ $\frac{\partial f}{\partial y} = x^4 e^{xy}$

☐ $\frac{\partial f}{\partial y} = x^3 y e^{xy}$

correct

Made by: Waqar Siddhu

Question No : 21 of 52

Marks: 1 (Budgeted Time 1 Min)

Domain of the function $f(x, y, z) = \sqrt{x^2 + y^2 + z^2}$ is

Answer (Please select your correct option)

VuAnswers.com

☒ Entire 3D-Space

correct

☐ Entire 3D-Space except origin

☐ First octant of 3D-Space

Made by: Waqar Siddhu

Question No : 19 of 52

Marks: 1 (Budgeted Time 1 Min)

Equation of the circular disk with radius a and origin at $(0, 0)$ is given by

Answer (Please select your correct option)

VuAnswers.com

☐ $x^2 + y^2 = a^2$

correct

☐ $x^2 + y^2 \geq a^2$

☐ $x^2 + y^2 \leq a^2$

Made by: Waqar Siddhu

Question No : 18 of 52

Marks: 1 (Budgeted Time 1 Min)

Consider the interval $(-1, 5)$ on co-ordinate line. What does this interval denote?

Answer (Please select your correct option)

VuAnswers.com

☐ The set of all real numbers between -1 and 5

correct

☐ The set of all integers between -1 and 5

☐ The set of all natural numbers between -1 and 5

☐ The set of all rational numbers between -1 and 5

Made by: Waqar Siddhu

Question No : 17 of 52

Marks: 1 (Budgeted Time 1 Min)

Which of the following is associated to each point on a plane?

Answer (Please select your correct option)

VuAnswers.com

☒ A real number

correct

☐ A natural number

☐ An ordered pair

Made by: Waqar Siddhu

Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

Divergence of a vector function is always a -----

Answer (Please select your correct option)

VuAnswers.com

Scalar

☒

correct

Vector

☐

Made by: Waqar Siddhu

Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)

If p is the period of a function then that function is said to be periodic if $f(x+p) = f(x)$, _____

Answer (Please select your correct option)

VuAnswers.com

☐ For all values of x in the domain of f

correct

☐ For positive values of x in the domain of f

☐ For negative values of x in the domain of f

Made by: Waqar Siddhu

Question No : 14 of 52

Marks: 1 (Budgeted Time 1 Min)

What is Laplace Inverse Transform of $\frac{s}{s^2 + 25}$

Answer (Please select your correct option)

VuAnswers.com

☐ $L^{-1}\left\{\frac{s}{s^2 + 25}\right\} = \sin 5t$

☐ $L^{-1}\left\{\frac{s}{s^2 + 25}\right\} = \cos 5t$

☐ $L^{-1}\left\{\frac{s}{s^2 + 25}\right\} = \sin 25t$

☐ $L^{-1}\left\{\frac{s}{s^2 + 25}\right\} = \cos 25t$

Made by: Waqar Siddhu

Question No : 11 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the value of $L(e^{5t})$ if L denotes laplace transform?

Answer (Please select your correct option)

VuAnswers.com

☐ $L(e^{5t}) = \frac{1}{s-5}$

correct

☐ $L(e^{5t}) = \frac{s}{s^2+25}$

☐ $L(e^{5t}) = \frac{5}{s^2+25}$

☐ $L(e^{5t}) = \frac{5!}{s^6}$

Made by: Waqar Siddhu

Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

If L denotes laplace transform then
 $L\{te^{5t}\} =$

Answer (Please select your correct option)

VuAnswers.com

☐ $L\{te^{5t}\} = \frac{1}{s^2 - 5}$

☐ $L\{te^{5t}\} = \frac{1}{s^2 + 5}$

☐ $L\{te^{5t}\} = \frac{1}{(s+5)^2}$

☒ $L\{te^{5t}\} = \frac{1}{(s-5)^2}$

correct

Made by: Waqar Siddhu

Question No : 12 of 52

Marks: 1 (Budgeted Time 1 Min)

What is laplace transform of the function $F(t)$ if $F(t) = \sin 3t$?

Answer (Please select your correct option)

VuAnswers.com

☐ $L(\sin 3t) = \frac{3}{s^2 + 9}$

correct

☐ $L(\sin 3t) = \frac{s}{s^2 + 9}$

☐ $L(\sin 3t) = \frac{1}{s-3}$

☐ $L(\sin 3t) = \frac{3!}{s^4}$

Made by: Waqar Siddhu

Question No : 10 of 52

Marks: 1 (Budgeted Time 1 Min)

Which of the following is Laplace inverse transform of the function $f(s)$ defined by $f(s) = \frac{3}{s-2} - \frac{2}{s}$?

Answer (Please select your correct option)

VuAnswers.com

☐ $3te^{2t} - 2$

☐ $3e^{2t} - 2t$

☐ $3e^{2t} - 2$

correct

☐ None of these

Made by: Waqar Siddhu

Question No : 8 of 52

Marks: 1 (Budgeted Time 1 Min)

The function $f(x) = x^3 e^x$ is -----

Answer (Please select your correct option)

VuAnswers.com

☐ Even function

☐ Odd function

☐ Neither even nor odd

correct

Made by: Waqar Siddhu

Question No : 9 of 52

Marks: 1 (Budgeted Time 1 Min)

The graph of an even function is symmetrical about -----

Answer (Please select your correct option)

VuAnswers.com

☐ x-axis

☐ y-axis

correct

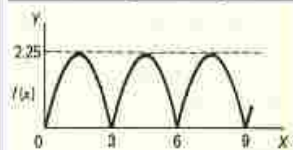
☐ origin

Made by: Waqar Siddhu

Question No : 7 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of periodic function whose graph is as below?



Answer (Please select your correct option)

VuAnswers.com

☐ 0

☐ 2.25

☒ 3

correct

☐ 6

Made by: Waqar Siddhu

Question No : 6 of 52

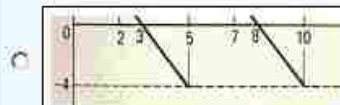
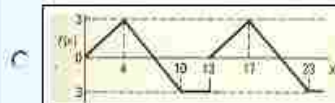
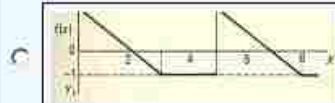
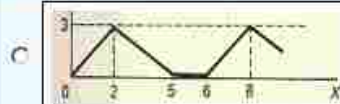
Marks: 1 (Budgeted Time 1 Min)

Match the following periodic function with its graph.

$$f(x) = \begin{cases} \frac{3}{4}x & 0 < x < 4 \\ 7 - x & 4 < x < 10 \\ -3 & 10 < x < 13 \end{cases}$$

Answer (Please select your correct option)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 6 of 52

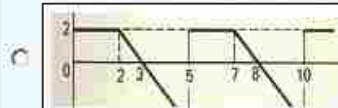
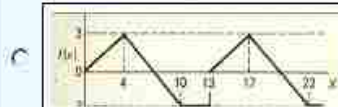
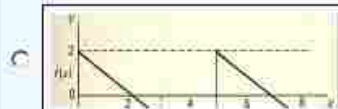
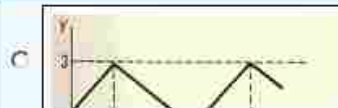
Marks: 1 (Budgeted Time 1 Min)

Match the following periodic function with its graph.

$$f(x) = \begin{cases} \frac{3}{4}x & 0 < x < 4 \\ 7 - x & 4 < x < 10 \\ -3 & 10 < x < 13 \end{cases}$$

Answer (Please select your correct option)

VuAnswers.com



correct

Made by: Waqar Siddhu

Question No : 5 of 52

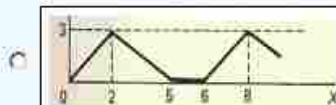
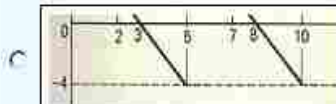
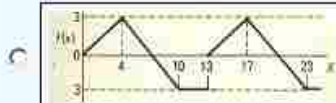
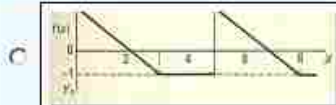
Marks: 1 (Budgeted Time 1 Min)

Match the following periodic function with its graph.

$$f(x) = \begin{cases} 2-x & 0 < x < 3 \\ -1 & 3 < x < 5 \end{cases}$$

Answer (Please select your correct option)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 4 of 52

Marks: 1 (Budgeted Time 1 Min)

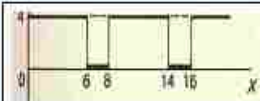
Match the following periodic function with its graph.

$$f(x) = \begin{cases} 4 & 0 < x < 5 \\ 0 & 5 < x < 8 \end{cases}$$

Answer (Please select your correct option)

VuAnswers.com

☐



☐



☐



☐



Made by: Waqar Siddhu

Question No : 5 of 52

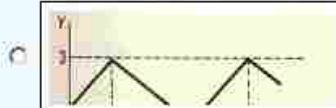
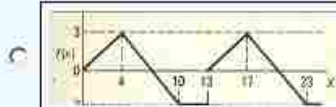
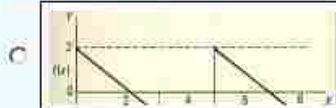
Marks: 1 (Budgeted Time 1 Min)

Match the following periodic function with its graph.

$$f(x) = \begin{cases} 2-x & 0 < x < 3 \\ -1 & 3 < x < 5 \end{cases}$$

Answer (Please select your correct option)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 4 of 52

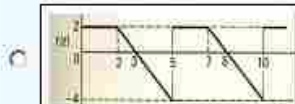
Marks: 1 (Budgeted Time 1 Min)

Match the following periodic function with its graph.

$$f(x) = \begin{cases} 4 & 0 < x < 5 \\ 0 & 5 < x < 8 \end{cases}$$

Answer (Please select your correct option)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of a periodic function defined by $f(x) = \sin \frac{x}{2}$?

Answer (Please select your correct option)

VuAnswers.com

☐ $\frac{\pi}{2}$

☒ π

correct

☐ $\frac{3\pi}{2}$

☐ 4π

Made by: Waqar Siddhu

Question No : 2 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the amplitude of a periodic function defined by $f(x) = 4 \cos 3x$?

Answer (Please select your correct option)

VuAnswers.com

☐ 1

☐ 3

☒ 4

correct

☐ 12

Made by: Waqar Siddhu

Question No : 1 of 52

Marks: 1 (Budgeted Time 1 Min)

Which one of the following is correct Wallis Cosine formula when n is odd and $n \geq 3$?

Answer (Please select your correct option)

VuAnswers.com

☐ $\int_0^{\frac{\pi}{2}} \cos^n x \, dx = \frac{\pi}{2} \frac{(n-1)}{n} \frac{(n-3)}{(n-2)} \frac{(n-5)}{(n-4)} \dots \frac{5}{6} \frac{3}{4} \frac{1}{2}$

☐ $\int_0^{\frac{\pi}{2}} \cos^n x \, dx = \frac{\pi}{2} \frac{(n)}{(n-1)} \frac{(n-2)}{(n-3)} \frac{(n-4)}{(n-5)} \dots \frac{6}{5} \frac{4}{3} \frac{2}{1}$

☐ $\int_0^{\frac{\pi}{2}} \cos^n x \, dx = \frac{(n)}{(n-1)} \frac{(n-2)}{(n-3)} \frac{(n-4)}{(n-5)} \dots \frac{6}{5} \frac{4}{3} \frac{2}{1}$

☐ $\int_0^{\frac{\pi}{2}} \cos^n x \, dx = \frac{(n-1)}{n} \frac{(n-3)}{(n-2)} \frac{(n-5)}{(n-4)} \dots \frac{6}{7} \frac{4}{5} \frac{2}{3}$

correct Made by: Waqar Siddhu

Question No : 9 of 52

Marks: 1 (Budgeted Time 1 Min)

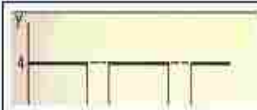
Match the following periodic function with its graph.

$$f(x) = \begin{cases} 4 & 0 < x < 6 \\ 0 & 6 < x < 8 \end{cases}$$

Answer (Please select your correct option)

VuAnswers.com

☐



correct

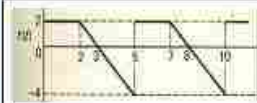
☐



☐



☐



Made by: Waqar Siddhu

Question No : 7 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of a periodic function defined by $f(x) = \sin \frac{x}{2}$?

Answer (Please select your correct option)

VuAnswers.com

☐ $\frac{\pi}{2}$

☐ π

☐ $\frac{3\pi}{2}$

☐ 4π

Made by: Waqar Siddhu

Question No : 8 of 52

Marks: 1 (Budgeted Time 1 Min)

Match the following periodic function with its graph

$$f(x) = \begin{cases} 4 & 0 < x < 5 \\ 0 & 5 < x < 8 \end{cases}$$

Answer (Please select your correct option)

VuAnswers.com

☐



☐

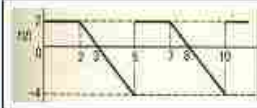


☒



correct

☐



Made by: Waqar Siddhu

Question No : 6 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of a periodic function defined by $f(x) = 4 \sin 2x$?

Answer (Please select your correct option)

VuAnswers.com

☐ 2°

☐ 4°

☐ 8°

☐ 180°

correct

☐ 360°

Made by: Waqar Siddhu

Question No : 50 of 52

Marks: 5 (Budgeted Time 10 Min)

Show that Laplace transform of the function

$$f(t) = 1 \quad \text{is}$$

$$\frac{1}{s} \quad \text{where } s \text{ is a constant for the integration and } s > 0.$$

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Determine whether the following vector field $\vec{F}$ is conservative or not.

$$\vec{F}(x, y, z) = (4x - z)\hat{i} + (3y + z)\hat{j} + (y - x)\hat{k}$$

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the amplitude of a periodic function defined by $f(x) = 4 \cos 3x$?

Answer (Please select your correct option)

VuAnswers.com

1

☐

3

☐

4

☒

correct

12

☐

Made by: Waqar Siddhu

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

A line, in three dimensional space, passes through the point $(3, -4, 2)$ and parallel to the vector $\vec{r} = 4\hat{i} + 3\hat{j} + 6\hat{k}$. Write down the equation of this line in parametric and symmetric form.

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

Using definite integral, find area of the region bounded by the curves of $y = x^2 + 1$ and $y = 5$



Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

Find $\text{div } \vec{F}$, if $\vec{F} = (3x+y)\hat{i} + xy^2z\hat{j} + (xz^2)\hat{k}$

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 45 of 52

Marks: 3 (Budgeted Time 6 Min)

What is the arc-length of the curve $\vec{r}(t) = (4+3t)\hat{i} + (2-2t)\hat{j} + (5+t)\hat{k}$ when $3 \leq t \leq 4$?

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 44 of 52

Marks: 2 (Budgeted Time 4 Min)

Given $\vec{a} \times \vec{b} = 3x\vec{i} + 2y\vec{j} + z\vec{k}$ and $\vec{c} = 7x\vec{i} + 4y\vec{j}$. Find scalar triple product of these vectors.

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

Prove whether the following function is even, odd or neither.

$$f(x) = x^2 - 4 \sin x$$

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 41 of 52

Marks: 2 (Budgeted Time 4 Min)

Determine whether the following differential is exact or not.

$$dz = 4x^3y^3 dx + 3x^4y^2 dy$$

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 42 of 52

Marks: 2 (Budgeted Time 4 Min)

Evaluate

$$\int_{-\pi}^{\pi} \cos nx \, dx$$

where n is an integer other than zero.

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 4 of 52

Marks: 1 (Budgeted Time 1 Min)

The following differential is exact:

$$dz = (6xy + 2y^2 - 5) dx + (3x^2 + 4xy - 6) dy$$

Answer (Please select your correct option)

VuAnswers.com

True:

☒

correct

False:

☐

Made by: Waqar Siddhu

Given the integral $\iint_R f(x,y) dx dy$, after converting to polar coordinates, it will become where $a \leq \theta \leq b$ and $c \leq r \leq d$.

Answer (Please select your correct option)

VuAnswers.com

☐ $\int_a^b \int_c^d f(r, \theta) r dr d\theta$

☐ $\int_a^b \int_c^d f(r, \theta) dr d\theta$

☐ $\int_a^b \int_c^d f(r, \theta) r d\theta dr$

☐ $\int_a^b \int_c^d f(r, \theta) d\theta dr$

Made by: Waqar Siddhu

Question No : 38 of 52

Marks: 1 (Budgeted Time 1 Min)

If $p(r, \theta)$ is a point in polar coordinate system, then r is the distance of p from

Answer (Please select your correct option)

VuAnswers.com

☐ Pole

☐ Imaginary axis

☐ None of these

☐ Polar axis

Made by: Waqar Siddhu

Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

The point $p(0, \theta)$ in polar coordinate system lies on

Answer (Please select your correct option)

VuAnswers.com

☐ Polar axis

☐ y-axis

☐ Pole

☐ None of these

Made by: Waqar Siddhu

Question No : 37 of 52

Marks: 1 (Budgeted Time 1 Min)

The graph of curve $r^2 = 4 \cos 2\theta$ is symmetric about

Answer (Please select your correct option)

VuAnswers.com

Initial line

☒

correct

y-axis

☐

both initial line and y-axis

☐

none of these

☐

Made by: Waqar Siddhu

Question No : 36 of 52

Marks: 1 (Budgeted Time 1 Min)

If the equation of a curve, in polar co-ordinates, remains unchanged after replacing (r, θ) by $(r, -\theta)$ then the curve is said to be symmetric about

Answer (Please select your correct option)

VuAnswers.com

☐ Initial line

☒ y-axis

correct

☐ Pole

☐ origin

Made by: Waqar Siddhu

Polar co-ordinates of a point are $\left(-2, \frac{-3\pi}{2}\right)$. Which of the following is another possible polar co-ordinates representation of this point?

Answer (Please select your correct option)

VuAnswers.com

☐ $\left(2, \frac{-\pi}{4}\right)$

☐ $\left(2, \frac{-\pi}{2}\right)$

☐ $\left(2, \frac{-\pi}{3}\right)$

☐ $\left(2, \frac{3\pi}{4}\right)$

Made by: Waqar Siddhu

Question No : 34 of 52

Marks: 1 (Budgeted Time 1 Min)

Match the following equation in polar co-ordinates with its graph

$$r \cos \theta = a$$

where a is an arbitrary constant

Answer (Please select your correct option)

VuAnswers.com

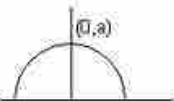
☐



☐



☐



☐



Made by: Waqar Siddhu

Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

Let R be a closed region in two dimensional space then the double integral over R calculates

Answer (Please select your correct option)

VuAnswers.com

☐ Area of R

☐ Radius of inscribed circle in R

☐ Distance between two endpoints of R

☐ None of these

Made by: Waqar Siddhu

If $R = \{(x, y) : 2 \leq x \leq 4 \text{ and } 0 \leq y \leq 1\}$, then $\iint_R (4xe^{2y}) dA = \dots\dots\dots$

Answer (Please select your correct option)

VuAnswers.com

☐ $\int_0^1 \int_2^4 (4xe^{2y}) dy dx$

☐ $\int_0^1 \int_2^4 (4xe^{2y}) dx dy$

☐ $\int_1^4 \int_0^2 (4xe^{2y}) dx dy$

☐ $\int_1^4 \int_0^2 (4xe^{2y}) dy dx$

Made by: Waqar Siddhu

Question No : 30 of 52

Marks: 1 (Budgeted Time 1 Min)

Two surfaces are said to be orthogonal at the point of their intersection if their normals at that point are -----

Answer (Please select your correct option)

VuAnswers.com

☐ Parallel

☐ Perpendicular

correct

☐ In opposite direction

☐ Overlapping

Made by: Waqar Siddhu

Question No : 31 of 52

Marks: 1 (Budgeted Time 1 Min)

For a function $f(x,y)$ to have both absolute maximum and minimum, it must be Continuous on set R

Answer (Please select your correct option)

VuAnswers.com

☐ a closed and bounded

☐ an open and bounded

☐ a closed and unbounded

☐ an open and unbounded

Made by: Waqar Siddhu

Evaluate the integral $\int \left[(3t-1)\hat{i} + \sqrt{t}\hat{j} \right] dt$

Answer (Please select your correct option)

VuAnswers.com

☐ $\int \left[(3t-1)\hat{i} + \sqrt{t}\hat{j} \right] dt = \left(\frac{3}{2}t^2 - t \right)\hat{i} + \left(\frac{3}{2}t^{\frac{3}{2}} \right)\hat{j} + C$

☐ $\int \left[(3t-1)\hat{i} + \sqrt{t}\hat{j} \right] dt = \left(\frac{3}{2}t^2 - t \right)\hat{i} + \left(\frac{2}{3}t^{\frac{3}{2}} \right)\hat{j} + C$

correct

☐ $\int \left[(3t-1)\hat{i} + \sqrt{t}\hat{j} \right] dt = \left(\frac{3}{2}t - t \right)\hat{i} + \left(\frac{2}{3}t^{\frac{3}{2}} \right)\hat{j} + C$

☐ $\int \left[(3t-1)\hat{i} + \sqrt{t}\hat{j} \right] dt = \left(\frac{3}{2}t^2 - t \right)\hat{i} + \left(\frac{1}{2}t^{\frac{3}{2}} \right)\hat{j} + C$

Made by: Waqar Siddhu

Question No : 29 of 52

Marks: 1 (Budgeted Time 1 Min)

The function decreases most rapidly in the direction of

Answer (Please select your correct option)

VuAnswers.com

☐ $-\nabla f$

correct

☐ $-\|\nabla f\|$

☐ $\nabla f \times \hat{a}$

☐ $\|\nabla f\|$

Made by: Waqar Siddhu

Suppose $f(x, y) = x^3 e^{xy}$. Which of the following options is correct?

Answer (Please select your correct option)

VuAnswers.com

☐ $\frac{\partial f}{\partial y} = 3x^3 e^{xy}$

☐ $\frac{\partial f}{\partial y} = x^3 e^{xy}$

☒ $\frac{\partial f}{\partial y} = x^4 e^{xy}$

correct

☐ $\frac{\partial f}{\partial y} = x^3 y e^{xy}$

Made by: Waqar Siddhu

Question No : 27 of 52

Marks: 1 (Budgeted Time 1 Min)

If rectangular co-ordinates of a point are $(1, \sqrt{3}, -2)$, then value of "r" in cylindrical co-ordinates is

Answer (Please select your correct option)

VuAnswers.com

☐ $\sqrt{2}$

☐ 2

☐ $2\sqrt{2}$

☐ $-2\sqrt{2}$

Made by: Waqar Siddhu

Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$ shows (x_1, y_1, z_1) and (x_2, y_2, z_2)

Answer (Please select your correct option)

VuAnswers.com

Distance between the points

☐

correct

Midpoint of the line joining the points

☐

Ratio between the points

☐

Made by: Waqar Siddhu

Question No : 26 of 52

Marks: 1 (Budgeted Time 1 Min)

Domain of the function $f(x, y) = \sqrt{y - x^2}$ satisfies the condition

Answer (Please select your correct option)

VuAnswers.com

☐ $y < x^2$

☒ $y \geq x^2$

correct

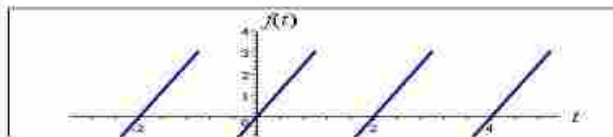
☐ $y \neq x^2$

☐ Entire space

Made by: Waqar Siddhu

Question No : 23 of 52

Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

VuAnswers.com

An odd function

☐

An even function

☐

Neither even nor odd

☐

Made by: Waqar Siddhu

Question No : 24 of 52

Marks: 1 (Budgeted Time 1 Min)

Which of the following set is the union of sets of rational and irrational numbers?

Answer (Please select your correct option)

VuAnswers.com

☐ Set of rational numbers

☐ Set of integers

☐ Set of real numbers

correct

☐ Empty set

Made by: Waqar Siddhu

Question No : 21 of 52

Marks: 1 (Budgeted Time 1 Min)

If p is the period of a function then that function is said to be periodic if $f(x+p) = f(x)$. _____

Answer (Please select your correct option)

VuAnswers.com

For all values of x in the domain of f

☒

correct

For positive values of x in the domain of f

☐

For negative values of x in the domain of f

☐

Made by: Waqar Siddhu

Question No : 22 of 52

Marks: 1 (Budgeted Time 1 Min)

A vector field is a vector each of whose components is a scalar field

Answer (Please select your correct option)

VuAnswers.com

True :

☐

False :

☒

correct

Made by: Waqar Siddhu

Question No : 20 of 52

Marks: 1 (Budgeted Time 1 Min)

Evaluate the line integral $\int_C (xy) dx + (1+y^2) dy$ where C is the line segment from $(1, 0)$ to $(3, 0)$.

Answer (Please select your correct option)

VuAnswers.com

☐ -4

☐ 0

correct

☐ 4

☐ Do not exist

Made by: Waqar Siddhu

Question No : 2 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the derivative of following vector-valued function?

$$\vec{r}(t) = (e^{t^2}, t^2, \sec 2t)$$

Answer (Please select your correct option)

VuAnswers.com

☐ $\vec{r}'(t) = (2te^{t^2}, 2t, 2 \sec 2t \tan 2t)$

☐ $\vec{r}'(t) = (te^{t^2}, 2t, \sec 2t \tan 2t)$

correct

☐ $\vec{r}'(t) = (2te^{t^2}, 2t, \tan 2t)$

☐ $\vec{r}'(t) = (t^2 e^{t^2}, 2t, \sec 2t \tan 2t)$

Made by: Waqar Siddhu

Question No : 19 of 52

Marks: 1 (Budgeted Time 1 Min)

Evaluate the line integral $\int_C (3x + 2y) dx + (2x - y) dy$ where C is the line segment from $(0, 0)$ to $(0, 2)$.

Answer (Please select your correct option)

VuAnswers.com

1

☐

0

☐

2

☒

correct

-2

☐

Made by: Waqar Siddhu

Question No : 18 of 52

Marks: 1 (Budgeted Time 1 Min)

What is Laplace Inverse Transform of $\frac{5}{s^2 + 25}$

Answer (Please select your correct option)

VuAnswers.com

☐ $L^{-1}\left\{\frac{5}{s^2 + 25}\right\} = \sin 5t$

correct

☐ $L^{-1}\left\{\frac{5}{s^2 + 25}\right\} = \cos 5t$

☐ $L^{-1}\left\{\frac{5}{s^2 + 25}\right\} = \sin 25t$

☐ $L^{-1}\left\{\frac{5}{s^2 + 25}\right\} = \cos 25t$

Made by: Waqar Siddhu

Question No : 17 of 52

Marks: 1 (Budgeted Time 1 Min)

What is laplace transform of the function $F(t)$ if $F(t) = \cos 2t$?

Answer (Please select your correct option)

VuAnswers.com

☐ $L(\cos 2t) = \frac{2}{s^2 + 4}$

correct

☐ $L(\cos 2t) = \frac{1}{s - 2}$

☐ $L(\cos 2t) = \frac{s}{s^2 + 4}$

☐ $L(\cos 2t) = \frac{2!}{s^3}$

Made by: Waqar Siddhu

Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)

Sign of line integral is reversed when -----

Answer (Please select your correct option)

VuAnswers.com

☐ path of integration is divided into parts.

☐ path of integration is parallel to y-axis.

☐ direction of path of integration is reversed.

correct

☐ path of integration is parallel to x-axis.

Made by: Waqar Siddhu

Question No : 14 of 52

Marks: 1 (Budgeted Time 1 Min)

The graph of an even function is symmetrical about -----

Answer (Please select your correct option)

VuAnswers.com

☐ x-axis

☒ y-axis

correct

☐ origin

Made by: Waqar Siddhu

Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

The graph of an odd function is symmetrical about -----

Answer (Please select your correct option)

VuAnswers.com

☐ x-axis

☐ y-axis

☐ origin

correct

Made by: Waqar Siddhu

Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

The function $f(x) = x^2 \cos 2x$ is -----

Answer (Please select your correct option)

VuAnswers.com

☐ Neither even nor odd

☐ Odd function

☒ Even function

correct

Made by: Waqar Siddhu

Let L denotes the Laplace Transform

If $L\{F(t)\} = f(s)$ where s is a constant and $\lim_{t \rightarrow 0} \left(\frac{F(t)}{t} \right)$ exists then which of the following equation holds?

Answer (Please select your correct option)

VuAnswers.com

☐ $L\left(\frac{F(t)}{t}\right) = f(s+a)$

☐ $L\left(\frac{F(t)}{t}\right) = f(s-a)$

☐ $L\left(\frac{F(t)}{t}\right) = \int_s^{\infty} f(s) ds$

correct

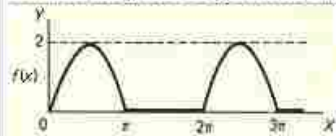
☐ $L\left(\frac{F(t)}{t}\right) = -\frac{d}{ds}\{f(s)\}$

Made by: Waqar Siddhu

Question No : 10 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of periodic function whose graph is as below?



Answer (Please select your correct option)

VuAnswers.com

0

☐

2

☐

π

☐

2π

☒

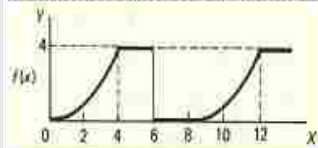
correct

Made by: Waqar Siddhu

Question No : 11 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of periodic function whose graph is as below?



Answer (Please select your correct option)

VuAnswers.com

☐ 0

☐ 4

☐ 4

☐ 6

☐ 6

☐ 8

☒ 8

correct

Made by: Waqar Siddhu

Question No : 1 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the derivative of following vector-valued function?

$$\vec{r}(t) = \left(t^4, \sqrt{t+1}, \frac{3}{t^2} \right)$$

Answer (Please select your correct option)

VuAnswers.com

☐ $\vec{r}'(t) = \left(4t^3, \frac{1}{\sqrt{t+1}}, \frac{-6}{t^3} \right)$

☐ $\vec{r}'(t) = \left(4t^3, \frac{1}{2\sqrt{t+1}}, \frac{6}{t^3} \right)$

☐ $\vec{r}'(t) = \left(4t^4, \frac{1}{2\sqrt{t+1}}, \frac{-6}{t^3} \right)$

☐ $\vec{r}'(t) = \left(4t^3, \frac{1}{2\sqrt{t+1}}, \frac{-6}{t^3} \right)$

correct

Made by: Waqar Siddhu

Question No : 36 of 52

Marks: 1 (Budgeted Time 1 Min)

If the equation of a curve, in polar co-ordinates, remains unchanged after replacing (r, θ) by $(r, -\theta)$ then the curve is said to be symmetric about

Answer (Please select your correct option)

VuAnswers.com

☐ Initial line

☒ y-axis

correct

☐ Pole

☐ origin

Made by: Waqar Siddhu

Question No : 35 of 52

Marks: 1 (Budgeted Time 1 Min)

Polar co-ordinates of a point are $\left(-2, \frac{-3\pi}{2}\right)$. Which of the following is another possible polar co-ordinates representation of this point?

☐ $\left(2, \frac{-\pi}{4}\right)$

☐ $\left(2, \frac{-\pi}{2}\right)$

☐ $\left(2, \frac{-\pi}{3}\right)$

☐ $\left(2, \frac{3\pi}{4}\right)$

VuAnswers.com

Made by: Waqar Siddhu

Question No : 34 of 52

Marks: 1 (Budgeted Time 1 Min)

Match the following equation in polar co-ordinates with its graph.

$$r \cos \theta = a$$

where a is an arbitrary constant

Answer (Please select your correct option)

VuAnswers.com

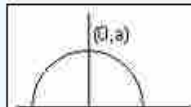
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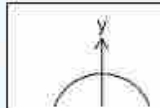
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☐



☐



Made by: Waqar Siddhu

Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

Let R be a closed region in two dimensional space then the double integral over R calculates

Answer (Please select your correct option)

VuAnswers.com

- ☐ Area of R
- ☐ Radius of inscribed circle in R
- ☐ Distance between two endpoints of R
- ☐ None of these

Made by: Waqar Siddhu

Question No : 32 of 52

Marks: 1 (Budgeted Time 1 Min)

If $R = \{(x, y) : 2 \leq x \leq 4 \text{ and } 0 \leq y \leq 1\}$, then $\iint_R (4xe^{2y}) dA = \dots\dots\dots$

Answer (Please select your correct option)

VuAnswers.com

☐ $\int_0^1 \int_2^4 (4xe^{2y}) dy dx$

☐ $\int_0^1 \int_2^4 (4xe^{2y}) dx dy$

☐ $\int_1^4 \int_0^2 (4xe^{2y}) dx dy$

☐ $\int_1^4 \int_0^2 (4xe^{2y}) dy dx$

Made by: Waqar Siddhu

Question No : 31 of 52

Marks: 1 (Budgeted Time 1 Min)

For a function $f(x,y)$ to have both absolute maximum and minimum, it must be Continuous on set R .

Answer (Please select your correct option)

VuAnswers.com

- ☐ a closed and bounded
- ☐ an open and bounded
- ☐ a closed and unbounded
- ☐ an open and unbounded

Made by: Waqar Siddhu

Question No : 30 of 52

Marks: 1 (Budgeted Time 1 Min)

Two surfaces are said to be orthogonal at the point of their intersection if their normals at that point are -----

Answer (Please select your correct option)

VuAnswers.com

☐ Parallel

☐ Perpendicular

correct

☐ In opposite direction

☐ Overlapping

Made by: Waqar Siddhu

Question No : 29 of 52

Marks: 1 (Budgeted Time 1 Min)

The function decreases most rapidly in the direction of

Answer (Please select your correct option)

VuAnswers.com

☒ $-\nabla f$

correct

☐ $-\|\nabla f\|$

☐ $\nabla f \times \hat{u}$

☐ $\|\nabla f\|$

Made by: Waqar Siddhu

Evaluate the integral $\int \left[(3t-1)\hat{i} + \sqrt{t}\hat{j} \right] dt$

Answer (Please select your correct option)

VuAnswers.com

☐ $\int \left[(3t-1)\hat{i} + \sqrt{t}\hat{j} \right] dt = \left(\frac{3}{2}t^2 - t \right)\hat{i} + \left(\frac{3}{2}t^{\frac{3}{2}} \right)\hat{j} + C$

☐ $\int \left[(3t-1)\hat{i} + \sqrt{t}\hat{j} \right] dt = \left(\frac{3}{2}t^2 - t \right)\hat{i} + \left(\frac{2}{3}t^{\frac{3}{2}} \right)\hat{j} + C$

correct

☐ $\int \left[(3t-1)\hat{i} + \sqrt{t}\hat{j} \right] dt = \left(\frac{3}{2}t - t \right)\hat{i} + \left(\frac{2}{3}t^{\frac{3}{2}} \right)\hat{j} + C$

☐ $\int \left[(3t-1)\hat{i} + \sqrt{t}\hat{j} \right] dt = \left(\frac{3}{2}t^2 - t \right)\hat{i} + \left(\frac{1}{2}t^{\frac{3}{2}} \right)\hat{j} + C$

Made by: Waqar Siddhu

Question No : 28 of 52

Marks: 1 (Budgeted Time 1 Min)

Suppose $f(x, y) = x^3 e^{xy}$. Which of the following options is correct?

Answer (Please select your correct option)

VuAnswers.com

☐ $\frac{\partial f}{\partial y} = 3x^3 e^{xy}$

☐ $\frac{\partial f}{\partial y} = x^3 e^{xy}$

☐ $\frac{\partial f}{\partial y} = x^4 e^{xy}$

correct

☐ $\frac{\partial f}{\partial y} = x^3 y e^{xy}$

Made by: Waqar Siddhu

Question No : 27 of 52

Marks: 1 (Budgeted Time 1 Min)

If rectangular co-ordinates of a point are $(1, \sqrt{3}, -2)$, then value of "r" in cylindrical co-ordinates is

Answer (Please select your correct option)

VuAnswers.com

☐ $\sqrt{2}$

☐ 2

☐ $2\sqrt{2}$

☐ $-2\sqrt{2}$

Made by: Waqar Siddhu

Question No : 26 of 52

Marks: 1 (Budgeted Time 1 Min)

Domain of the function $f(x, y) = \sqrt{y - x^2}$ satisfies the condition

Answer (Please select your correct option)

VuAnswers.com

☐ $y < x^2$

☐ $y \geq x^2$

correct

☐ $y \neq x^2$

☐ Entire space

Made by: Waqar Siddhu

Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$ shows (x_1, y_1, z_1) and (x_2, y_2, z_2) .

Answer (Please select your correct option)

VuAnswers.com

Distance between the points:

☒

correct

Midpoint of the line joining the points:

☐

Ratio between the points:

☐

Made by: Waqar Siddhu

Question No : 24 of 52

Marks: 1 (Budgeted Time 1 Min)

Which of the following set is the union of sets of rational and irrational numbers?

Answer (Please select your correct option)

VuAnswers.com

☐ Set of rational numbers

☐ Set of integers

☐ Set of real numbers

correct

☐ Empty set

Made by: Waqar Siddhu

Question No : 22 of 52

Marks: 1 (Budgeted Time 1 Min)

A vector field is a vector each of whose components is a scalar field

Answer (Please select your correct option)

VuAnswers.com

True

☐

False

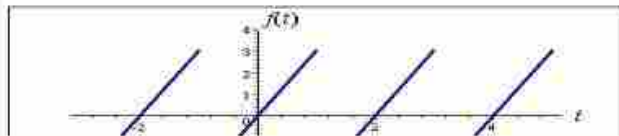
☒

correct

Made by: Waqar Siddhu

Question No : 23 of 52

Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

VuAnswers.com

☐ An odd function

☐

☐ An even function

☐

☐ Neither even nor odd

☐

Made by: Waqar Siddhu

Question No : 21 of 52

Marks: 1 (Budgeted Time 1 Min)

If p is the period of a function then that function is said to be periodic if $f(x+p) = f(x)$. _____

Answer (Please select your correct option)

VuAnswers.com

☐ For all values of x in the domain of f

correct

☐ For positive values of x in the domain of f

☐ For negative values of x in the domain of f

Made by: Waqar Siddhu

Question No : 20 of 52

Marks: 1 (Budgeted Time 1 Min)

Evaluate the line integral $\int_C (xy) dx + (1 + y^2) dy$ where C is the line segment from $(1, 0)$ to $(3, 0)$.

Answer (Please select your correct option)

VuAnswers.com

☐ -4

☐ 0

correct

☐ 4

☐ Do not exist

Made by: Waqar Siddhu

Question No : 2 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the derivative of following vector-valued function?

$$\vec{r}(t) = (e^{t^2}, t^2, \sec 2t)$$

Answer (Please select your correct option)

VuAnswers.com

☐ $\vec{r}'(t) = (2te^{t^2}, 2t, 2 \sec 2t \tan 2t)$

☐ $\vec{r}'(t) = (te^{t^2}, 2t, \sec 2t \tan 2t)$

correct

☐ $\vec{r}'(t) = (2te^{t^2}, 2t, \tan 2t)$

☐ $\vec{r}'(t) = (t^2e^{t^2}, 2t, \sec 2t \tan 2t)$

Made by: Waqar Siddhu

Question No : 19 of 52

Marks: 1 (Budgeted Time 1 Min)

Evaluate the line integral $\int_C (3x + 2y) dx + (2x - y) dy$ where C is the line segment from $(0, 0)$ to $(0, 2)$.

Answer (Please select your correct option)

VuAnswers.com

☐ 1

☐ 0

☒ 2

correct

☐ -2

Made by: Waqar Siddhu

Question No : 18 of 52

Marks: 1 (Budgeted Time 1 Min)

What is Laplace Inverse Transform of $\frac{5}{s^2 + 25}$

Answer (Please select your correct option)

VuAnswers.com

☐ $L^{-1}\left\{\frac{5}{s^2 + 25}\right\} = \sin 5t$

correct

☐ $L^{-1}\left\{\frac{5}{s^2 + 25}\right\} = \cos 5t$

☐ $L^{-1}\left\{\frac{5}{s^2 + 25}\right\} = \sin 25t$

☐ $L^{-1}\left\{\frac{5}{s^2 + 25}\right\} = \cos 25t$

Made by: Waqar Siddhu

Question No : 17 of 52

Marks: 1 (Budgeted Time 1 Min)

What is laplace transform of the function $F(t)$ if $F(t) = \cos 2t$?

Answer (Please select your correct option)

VuAnswers.com

☒ $L(\cos 2t) = \frac{2}{s^2 + 4}$

correct

☐ $L(\cos 2t) = \frac{1}{s-2}$

☐ $L(\cos 2t) = \frac{s}{s^2 + 4}$

☐ $L(\cos 2t) = \frac{2}{s^3}$

Made by: Waqar Siddhu

Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)

Sign of line integral is reversed when -----

Answer (Please select your correct option)

VuAnswers.com

☐ path of integration is divided into parts.

☐ path of integration is parallel to y-axis.

☐ direction of path of integration is reversed.

correct

☐ path of integration is parallel to x-axis.

Made by: Waqar Siddhu

Question No : 14 of 52

Marks: 1 (Budgeted Time 1 Min)

The graph of an even function is symmetrical about -----

Answer (Please select your correct option)

VuAnswers.com

☐ x-axis

☐ y-axis

correct

☐ origin

Made by: Waqar Siddhu

Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

The graph of an odd function is symmetrical about -----

Answer (Please select your correct option)

VuAnswers.com

☐ x-axis

☐ y-axis

☐ origin

correct

Made by: Waqar Siddhu

Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

The function $f(x) = x^2 \cos 2x$ is -----

Answer (Please select your correct option)

VuAnswers.com

☐ Neither even nor odd

☐ Odd function

☐ Even function

correct

Made by: Waqar Siddhu

Question No : 12 of 52

Marks: 1 (Budgeted Time 1 Min)

Let L denotes the Laplace Transform.

If $L(F(t)) = f(s)$ where s is a constant and $\lim_{t \rightarrow 0} \left(\frac{F(t)}{t} \right)$ exists then which of the following equation holds?

Answer (Please select your correct option)

VuAnswers.com

☐ $L\left(\frac{F(t)}{t}\right) = f(s+a)$

☐ $L\left(\frac{F(t)}{t}\right) = f(s-a)$

☐ $L\left(\frac{F(t)}{t}\right) = \int_s^{\infty} f(s) ds$

correct

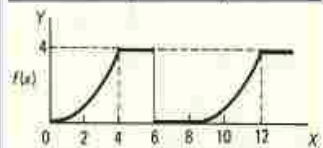
☐ $L\left(\frac{F(t)}{t}\right) = -\frac{d}{ds}(f(s))$

Made by: Waqar Siddhu

Question No : 11 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of periodic function whose graph is as below?



Answer (Please select your correct option)

VuAnswers.com

☐ 0

☐ 4

☐ 6

☒ 8

correct

Made by: Waqar Siddhu

Question No : 1 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the derivative of following vector-valued function?

$$\vec{r}(t) = \left(t^4, \sqrt{t+1}, \frac{3}{t^3} \right)$$

Answer (Please select your correct option)

VuAnswers.com

☐ $\vec{r}'(t) = \left(4t^3, \frac{1}{\sqrt{t+1}}, \frac{-6}{t^3} \right)$

☐ $\vec{r}'(t) = \left(4t^3, \frac{1}{2\sqrt{t+1}}, \frac{6}{t^3} \right)$

☐ $\vec{r}'(t) = \left(4t^4, \frac{1}{2\sqrt{t+1}}, \frac{-6}{t^3} \right)$

☐ $\vec{r}'(t) = \left(4t^3, \frac{1}{2\sqrt{t+1}}, \frac{-6}{t^3} \right)$

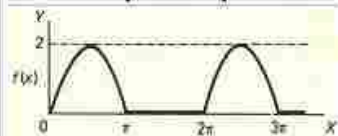
correct

Made by: Waqar Siddhu

Question No : 10 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of periodic function whose graph is as below?



Answer (Please select your correct option)

VuAnswers.com

☐ 0

☐ 2

☐ π

☐ 2π

correct

Made by: Waqar Siddhu

Question No : 9 of 52

Marks: 1 (Budgeted Time 1 Min)

Match the following periodic function with its graph.

$$f(x) = \begin{cases} 4 & 0 < x < 6 \\ 0 & 6 < x < 8 \end{cases}$$

Answer (Please select your correct option)

VuAnswers.com

☒

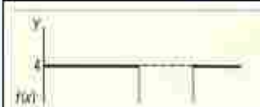


correct

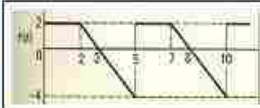
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☐



☐



Made by: Waqar Siddhu

Question No : 8 of 52

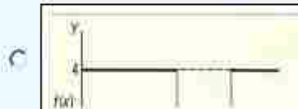
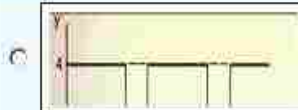
Marks: 1 (Budgeted Time 1 Min)

Match the following periodic function with its graph.

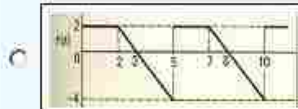
$$f(x) = \begin{cases} 4 & 0 < x < 5 \\ 0 & 5 < x < 8 \end{cases}$$

Answer (Please select your correct option)

VuAnswers.com



correct



Made by: Waqar Siddhu

Question No : 7 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of a periodic function defined by $f(x) = \sin \frac{x}{2}$?

Answer (Please select your correct option)

VuAnswers.com

☐ $\frac{\pi}{2}$

☐ π

☐ $\frac{3\pi}{2}$

☐ 4π

Made by: Waqar Siddhu

Question No : 6 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of a periodic function defined by $f(x) = 4 \sin 2x$?

Answer (Please select your correct option)

VuAnswers.com

☐ 2°

☐ 4°

☐ 8°

☐ 180°

correct

☐ 360°

Made by: Waqar Siddhu

Question No : 52 of 52

Marks: 5 (Budgeted Time 10 Min)

Consider the point $(-5, 5, 6)$ in rectangular coordinate system. Convert it into Spherical coordinates.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 51 of 52

Marks: 5 (Budgeted Time 10 Min)

Determine whether the following vector field $\vec{F}$ is conservative or not.

$$\vec{F}(x, y, z) = (4x - z)\vec{i} + (3y + z)\vec{j} + (y - x)\vec{k}$$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 50 of 52

Marks: 5 (Budgeted Time 10 Min)

Show that Laplace transform of the function

$$f(t) = 1 \quad \text{is}$$

$$\frac{1}{s} \quad \text{where } s \text{ is a constant for the integration and } s > 0.$$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the amplitude of a periodic function defined by $f(x) = 4\cos 3x$?

Answer (Please select your correct option)

VuAnswers.com

☐ 1

☐ 3

☒ 4

correct

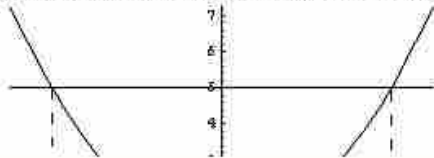
☐ 12

Made by: Waqar Siddhu

Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

Using definite integral, find area of the region bounded by the curves of $y = x^2 + 1$ and $y = 5$



Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

A line, in three dimensional space, passes through the point $(3, -4, 2)$ and parallel to the vector $\vec{r} = 4\hat{i} + 3\hat{j} + 6\hat{k}$. Write down the equation of this line in parametric and symmetric form.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

Find $\text{div } \vec{F}$, if $\vec{F} = (3x+y)\hat{i} + xy^2z\hat{j} + (xz^2)\hat{k}$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 45 of 52

Marks: 3 (Budgeted Time 6 Min)

What is the arc-length of the curve $\vec{r}(t) = (4+3t)\hat{i} + (2-2t)\hat{j} + (5+t)\hat{k}$ when $3 \leq t \leq 4$?

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

Prove whether the following function is even, odd or neither.

$$f(x) = x^2 - 4 \sin x$$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 44 of 52

Marks: 2 (Budgeted Time 4 Min)

Given $\vec{a} \times \vec{b} = 3xi + 2yj + zk$ and $\vec{c} = 7xi + 4yk$. Find scalar triple product of these vectors.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 42 of 52

Marks: 2 (Budgeted Time 4 Min)

Evaluate

$$\int_{-\pi}^{\pi} \cos nx \, dx$$

where n is an integer other than zero.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 41 of 52

Marks: 2 (Budgeted Time 4 Min)

Determine whether the following differential is exact or not:

$$dz = 4x^3y^3 dx + 3x^4y^2 dy$$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 4 of 52

Marks: 1 (Budgeted Time 1 Min)

The following differential is exact:

$$dz = (6xy + 2y^2 - 5) dx + (3x^2 + 4xy - 6) dy$$

Answer (Please select your correct option)

VuAnswers.com

True

☐

correct

False

☐

Made by: Waqar Siddhu

Question No : 40 of 52

Marks: 1 (Budgeted Time 1 Min)

Given the integral $\iint_R f(x,y) dx dy$, after converting to polar coordinates, it will become where $a \leq \theta \leq b$ and $c \leq r \leq d$.

Answer (Please select your correct option)

VuAnswers.com

☐ $\int_a^b \int_c^d f(r, \theta) r dr d\theta$

☐ $\int_a^b \int_c^d f(r, \theta) dr d\theta$

☐ $\int_a^b \int_c^d f(r, \theta) r d\theta dr$

☐ $\int_a^b \int_c^d f(r, \theta) d\theta dr$

Made by: Waqar Siddhu

Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

The point $p(0, \theta)$ in polar coordinate system lies on

Answer (Please select your correct option)

VuAnswers.com

☐ Polar axis

☐ y-axis

☐ Pole

☐ None of these

Made by: Waqar Siddhu

Question No : 38 of 52

Marks: 1 (Budgeted Time 1 Min)

If $p(r, \theta)$ is a point in polar coordinate system, then r is the distance of p from

Answer (Please select your correct option)

VuAnswers.com

☐ Pole

☐ Imaginary axis

☐ None of these

☐ Polar axis

Made by: Waqar Siddhu

Question No : 37 of 52

Marks: 1 (Budgeted Time 1 Min)

The graph of curve $r^2 = 4 \cos 2\theta$ is symmetric about

Answer (Please select your correct option)

VuAnswers.com

☐ Initial line

correct

☐ y-axis

☐ both initial line and y-axis

☐ none of these

Made by: Waqar Siddhu

Question No : 52 of 52

Marks: 5 (Budgeted Time 10 Min)

Let $\vec{r}(t) = t^2 \hat{i} + t \hat{j} + (t^2 - 5) \hat{k}$. Find t , such that $\vec{r}(t)$ and $\vec{r}'(t)$ are perpendicular to each other.

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 50 of 52

Marks: 5 (Budgeted Time 10 Min)

Determine whether the following vector field $\vec{F}$ is conservative or not.

$$\vec{F}(x, y, z) = (3x + y)\hat{i} + xy^2z\hat{j} + xz^2\hat{k}$$

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 51 of 52

Marks: 5 (Budgeted Time 10 Min)

Using second partial derivative test show that the function $f(x, y) = xy(24 - x - y)$ is maximum at $x = 8, y = 8$.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

Determine the Fourier co-efficient b_n of the periodic function defined below:
 $f(x) = 2x + 1 \quad 0 < x < 2$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

What is the arc-length of the curve $\vec{r}(t) = (4+3t)\hat{i} + (2-2t)\hat{j}$ when $3 \leq t \leq 4$?

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 47 of 52

Marks: 3 (Budgeted Time 6 Min)

Find the region where the function $f(x, y) = \sqrt{9 - x^2 - y^2}$ is continuous.

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

Prove whether the following function is even, odd or neither.

$$f(x) = \sin^2 x \cos 3x$$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 45 of 52

Marks: 3 (Budgeted Time 6 Min)

Use Wallis cosine formula to evaluate $\int_0^{\frac{\pi}{2}} (\cos^3 x + \cos^4 x) dx$

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 44 of 52

Marks: 2 (Budgeted Time 4 Min)

Write down the expression for the arc-length of the curve represented by the vector valued function $\vec{r}(t) = \cos t^2 \vec{i} + \sin t^2 \vec{j}$ where $0 \leq t \leq \frac{\pi}{2}$. (Do not evaluate the expression).

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

Consider the point $\left(\frac{\sqrt{3}}{2}, \sqrt{3}, \frac{1}{2}\right)$ in rectangular coordinate system. Find the value of " ρ " in spherical coordinates.

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 42 of 52

Marks: 2 (Budgeted Time 4 Min)

Prove whether the following function is even, odd or neither.

$$f(x) = x^3 + x^2$$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 41 of 52

Marks: 2 (Budgeted Time 4 Min)

Use Wallis sine formula to evaluate $\int_0^{\pi/4} \sin^5 x \, dx$

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 40 of 52

Marks: 1 (Budgeted Time 1 Min)

A function is said to be smooth if it's derivative is on any value of its domain.

Answer (Please select your correct option)

VuAnswers.com

☐ continuous and non zero

☐ piecewise continuous

☐ defined and non zero

☐ differentiable

correct

Made by: Waqar Siddhu

Question No : 38 of 52

Marks: 1 (Budgeted Time 1 Min)

For any two vector valued functions $\vec{r}_1(t)$ and $\vec{r}_2(t)$, $\frac{d}{dt}[\vec{r}_1(t) \times \vec{r}_2(t)] = \dots\dots\dots$ where " $\times$ " and " $\cdot$ " represent the cross and dot product respectively.

Answer (Please select your correct option)

VuAnswers.com

☐ $\vec{r}_1 \cdot \frac{d\vec{r}_2}{dt} - \frac{d\vec{r}_1}{dt} \cdot \vec{r}_2$

☐ $\vec{r}_1 \cdot \frac{d\vec{r}_2}{dt} + \frac{d\vec{r}_1}{dt} \cdot \vec{r}_2$

☐ $\vec{r}_1 \times \frac{d\vec{r}_2}{dt} + \frac{d\vec{r}_1}{dt} \times \vec{r}_2$

☐ $\vec{r}_1 \cdot \frac{d\vec{r}_2}{dt} - \frac{d\vec{r}_1}{dt} \times \vec{r}_2$

correct

Made by: Waqar Siddhu

Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

A single curve can be represented by vector valued function(s).

Answer (Please select your correct option)

VuAnswers.com

☐ Two

☐ Infinitely many

☒ Single

correct

☐ Three

Made by: Waqar Siddhu

Question No : 36 of 52

Marks: 1 (Budgeted Time 1 Min)

A vector valued function $\vec{r}(t) = x(t)\hat{i} + y(t)\hat{j} + z(t)\hat{k}$ is continuous if

Answer (Please select your correct option)

VuAnswers.com

- ☐ Atleast one of its components is continuous.
- ☐ All of its components are necessarily differentiable.
- ☐ All of its components are continuous.
- ☐ Limit exists for all of its components.

correct

Made by: Waqar Siddhu

Question No : 37 of 52

Marks: 1 (Budgeted Time 1 Min)

Given a vector valued function $\vec{r}(t) = \frac{1}{(t-3)}\hat{i} + e^t\hat{j}$ and its anti-derivative $\vec{R}(t) = \ln(t-3)\hat{i} + e^t\hat{j}$, then $\int \vec{r}(t) dt =$

Answer (Please select your correct option)

VuAnswers.com

☐ $\ln(t-3)\hat{i} + e^t\hat{j} + c$

☐ $(t-3)\hat{i} + \frac{e^t}{2}\hat{j} + c$

☐ $(t-3)^{-1}\hat{i} + \frac{e^t}{2}\hat{j} + c$

☐ $\frac{1}{(t-3)}\hat{i} + e^t\hat{j}$

Correct Made by: Waqar Siddhu

Question No : 35 of 52

Marks: 1 (Budgeted Time 1 Min)

For the given vector valued functions $\vec{r}_1(t)$ and $\vec{r}_2(t)$, $\frac{d}{dt}[\vec{r}_1(t) \times \vec{r}_2(t)] = \dots\dots\dots$ where " $\times$ " and " $\cdot$ " represent the cross and dot product respectively

Answer (Please select your correct option)

VuAnswers.com

☐ $\vec{r}_1 \cdot \frac{d\vec{r}_2}{dt} + \frac{d\vec{r}_1}{dt} \cdot \vec{r}_2$

☐ $\vec{r}_1 \times \frac{d\vec{r}_2}{dt} + \frac{d\vec{r}_1}{dt} \times \vec{r}_2$

☐ $\frac{d\vec{r}_2}{dt} \times \vec{r}_1 + \vec{r}_2 \times \frac{d\vec{r}_1}{dt}$

☐ $\frac{d\vec{r}_2}{dt} \times \vec{r}_1 + \frac{d\vec{r}_1}{dt} \times \vec{r}_2$

Made by: Waqar Siddhu

Question No : 34 of 52

Marks: 1 (Budgeted Time 1 Min)

If $\vec{R}(t)$ is the anti-derivative of a given vector valued function $\vec{r}(t)$ i.e., $\vec{R}'(t) = \vec{r}(t)$ then $\int_a^b \vec{r}(t) dt = \dots\dots\dots$

Answer (Please select your correct option)

VuAnswers.com

☐ $\vec{R}(a) + \vec{R}(b)$

☐ $\vec{R}(b) - \vec{R}(a) + c$ where c is a non-zero constant

☐ $\vec{R}(a) \vec{R}(b)$

☐ $\vec{R}(b) - \vec{R}(a)$

Made by: Waqar Siddhu

Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

The parametric equations that correspond to the vector equation $\vec{r}(t) = \sin^2 t \hat{i} + (1 - \cos 2t) \hat{j}$ are

Answer (Please select your correct option)

VuAnswers.com

☐ $x = \sin^2 t$, $y = 1 - \cos 2t$, $z = 0$

correct

☐ $y = \sin^2 t$, $x = 1 - \cos 2t$, $z = 0$

☐ $x = \sin^2 t$, $y = 1 - \cos 2t$, $z = 1$

☐ $x = \sin^2 t$, $y = \cos 2t$, $z = 1$

Made by: Waqar Siddhu

Question No : 32 of 52

Marks: 1 (Budgeted Time 1 Min)

Given the integral $\iint_R f(x,y) dx dy$, after converting to polar coordinates, it will become where $a \leq \theta \leq b$ and $c \leq r \leq d$.

Answer (Please select your correct option)

VuAnswers.com

☐ $\int_a^b \int_c^d f(r, \theta) r dr d\theta$

☐ $\int_a^b \int_c^d f(r, \theta) dr d\theta$

correct

☐ $\int_a^b \int_c^d f(r, \theta) r d\theta dr$

☐ $\int_a^b \int_c^d f(r, \theta) d\theta dr$

Made by: Waqar Siddhu

Question No : 31 of 52

Marks: 1 (Budgeted Time 1 Min)

The point $p(0, \theta)$ in polar coordinate system lies on

Answer (Please select your correct option)

VuAnswers.com

☐ Polar axis

☐ y-axis

☒ Pole

correct

☐ None of these

Made by: Waqar Siddhu

Question No : 30 of 52

Marks: 1 (Budgeted Time 1 Min)

In polar coordinate system, x- axis is also called

Answer (Please select your correct option)

VuAnswers.com

☐ Polar axis

correct

☐ Pole

☐ Imaginary axis

☐ None of these

Made by: Waqar Siddhu

Question No : 29 of 52

Marks: 1 (Budgeted Time 1 Min)

If the equation of a curve, in polar co-ordinates, remains unchanged after replacing (r, θ) by $(r, \pi - \theta)$ then the curve is said to be symmetric about

Answer (Please select your correct option)

VuAnswers.com

☒ y-axis

correct

☐ Pole

☐ Initial line

☐ origin

Made by: Waqar Siddhu

Question No : 28 of 52

Marks: 1 (Budgeted Time 1 Min)

Polar co-ordinates of a point are $\left(-2, \frac{-3\pi}{2}\right)$. Which of the following is another possible polar co-ordinates representation of this point?

Answer (Please select your correct option)

VuAnswers.com

☐ $\left(-2, \frac{\pi}{2}\right)$

correct

☐ $\left(-2, \frac{\pi}{4}\right)$

☐ $\left(-2, \frac{3\pi}{4}\right)$

☐ $\left(-2, \frac{\pi}{3}\right)$

Made by: Waqar Siddhu

Question No : 27 of 52

Marks: 1 (Budgeted Time 1 Min)

Polar co-ordinates of a point are $\left(7, \frac{-\pi}{4}\right)$. Which of the following is another possible polar co-ordinates representation of this point?

Answer (Please select your correct option)

VuAnswers.com

☒ $\left(7, \frac{3\pi}{4}\right)$

correct

☐ $\left(-7, \frac{3\pi}{4}\right)$

☐ $\left(-7, \frac{-\pi}{4}\right)$

☐ $\left(7, \frac{-3\pi}{4}\right)$

Made by: Waqar Siddhu

Question No : 26 of 52

Marks: 1 (Budgeted Time 1 Min)

If $R = \{(x, y) : 0 \leq x \leq 2 \text{ and } 1 \leq y \leq 4\}$, then $\iint_R (6x^2 + 4xy^3) dA = \dots\dots\dots$

Answer (Please select your correct option)

VuAnswers.com

☐ $\int_1^4 \int_0^2 (6x^2 + 4xy^3) dy dx$

☐ $\int_0^2 \int_1^4 (6x^2 + 4xy^3) dx dy$

☐ $\int_1^4 \int_0^2 (6x^2 + 4xy^3) dx dy$

correct

☐ $\int_0^2 \int_1^4 (6x^2 + 4xy^3) dx dy$

Made by: Waqar Siddhu

Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

The volume of parallelepiped with dimensions x, y, z is

Answer (Please select your correct option)

VuAnswers.com

☐ $V = x^2 y^2 z^2$

☐ $V = x + y + z$

☐ $V = \sqrt{xyz}$

☐ $V = xyz$

correct

Made by: Waqar Siddhu

Question No : 24 of 52

Marks: 1 (Budgeted Time 1 Min)

At the critical point (x_0, y_0) , if $D = f_{xx}(x_0, y_0)f_{yy}(x_0, y_0) - f_{xy}^2(x_0, y_0) < 0$ then f has a

Answer (Please select your correct option)

VuAnswers.com

☐ Relative maximum at (x_0, y_0)

☐ Relative minimum at (x_0, y_0)

correct

☐ Saddle point at (x_0, y_0)

☐ No conclusion can be drawn

Made by: Waqar Siddhu

Question No : 23 of 52

Marks: 1 (Budgeted Time 1 Min)

Gradient of a scalar function always results in a function.

Answer (Please select your correct option)

VuAnswers.com

☐ Scalar

☐ Continuous

☒ Vector

correct

☐ Constant

Made by: Waqar Siddhu

Question No : 21 of 52

Marks: 1 (Budgeted Time 1 Min)

$$\lim_{(x,y) \rightarrow (0,1)} \frac{x^2}{x^2 + y^2} =$$

Answer (Please select your correct option)

VuAnswers.com

☐ ∞

☐ 0

correct

☐ 1

☐ 0.5

Made by: Waqar Siddhu

Question No : 22 of 52

Marks: 1 (Budgeted Time 1 Min)

The function $z = \frac{1}{\sqrt{x+y}}$ is discontinuous at origin because at the point (0,0), it

Answer (Please select your correct option)

VuAnswers.com

- ☐ has a jump
- ☐ has a hole
- ☐ approaches towards infinity
- ☐ approaches towards zero

correct

Made by: Waqar Siddhu

Question No : 20 of 52

Marks: 1 (Budgeted Time 1 Min)

Intersection of two non parallel planes is a

Answer (Please select your correct option)

VuAnswers.com

☐ Plane

☐ Point

☐ Straight line

correct

☐ None of these

Made by: Waqar Siddhu

Question No : 19 of 52

Marks: 1 (Budgeted Time 1 Min)

If α, β and γ are the direction angles of a line then
 $\cos^2 \alpha + \cos^2 \beta + \cos^2 \gamma =$

Answer (Please select your correct option)

VuAnswers.com

0

☐

1

☒

correct

2

☐

T

☐

Made by: Waqar Siddhu

Question No : 17 of 52

Marks: 1 (Budgeted Time 1 Min)

All axes are positive in ----- octant.

Answer (Please select your correct option)

VuAnswers.com

First

☐

correct

Second

☐

Fourth

☐

Eighth

☐

Made by: Waqar Siddhu

Question No : 18 of 52

Marks: 1 (Budgeted Time 1 Min)

The angles which a line makes with positive x , y and z-axes are known as -----

Answer (Please select your correct option)

VuAnswers.com

☐ Direction cosines

☐ Direction ratios

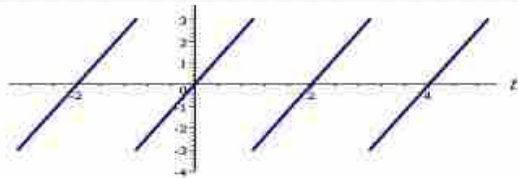
☒ Direction angles

correct

Made by: Waqar Siddhu

Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

VuAnswers.com

☐ An odd function

☐

☐ An even function

☐

☐ Neither even nor odd

☐

Made by: Waqar Siddhu

Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)



The graph of "saw tooth wave" given above is -----

Answer (Please select your correct option)

VuAnswers.com

☐ An odd function

☐

☐ An even function

☐

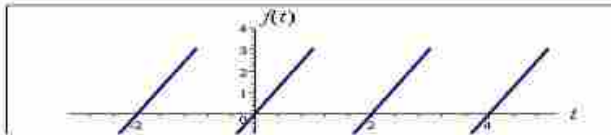
☐ Neither even nor odd

☐

Made by: Waqar Siddhu

Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

VuAnswers.com

☐ An odd function

☐

☐ An even function

☐

☐ Neither even nor odd

☐

Made by: Waqar Siddhu

Question No : 14 of 52

Marks: 1 (Budgeted Time 1 Min)

What is $L(-6)$ if L denotes Laplace Transform?

Answer (Please select your correct option)

VuAnswers.com

☐ $L(-6) = \frac{1}{s+6}$

☒ $L(-6) = \frac{-6}{s}$

correct

☐ $L(-6) = \frac{s}{s^2+36}$

☐ $L(-6) = \frac{-6}{s^2+36}$

Made by: Waqar Siddhu

Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

If L denotes laplace transform then
 $L(te^{5t}) =$

Answer (Please select your correct option)

VuAnswers.com

☐ $L(te^{5t}) = \frac{1}{s^2 - 5}$

☐ $L(te^{5t}) = \frac{1}{s^2 + 5}$

☐ $L(te^{5t}) = \frac{1}{(s+5)^2}$

☐ $L(te^{5t}) = \frac{1}{(s-5)^2}$

correct

Made by: Waqar Siddhu

Question No : 11 of 52

Marks: 1 (Budgeted Time 1 Min)

Which of the following is Laplace inverse transform of the function $f(s)$ defined by $f(s) = \frac{3}{s-2} - \frac{2}{s}$?

Answer (Please select your correct option)

VuAnswers.com

☐ $3te^{2t} - 2$

☐ $3e^{2t} - 2t$

☐ $3e^{2t} - 2$

correct

☐ None of these.

Made by: Waqar Siddhu

Question No : 12 of 52

Marks: 1 (Budgeted Time 1 Min)

What is laplace transform of the function $F(t)$ if $F(t) = \sin 3t$?

Answer (Please select your correct option)

VuAnswers.com

☐ $L(\sin 3t) = \frac{3}{s^2 + 9}$

correct

☐ $L(\sin 3t) = \frac{s}{s^2 + 9}$

☐ $L(\sin 3t) = \frac{1}{s-3}$

☐ $L(\sin 3t) = \frac{3!}{s^4}$

Made by: Waqar Siddhu

Question No : 10 of 52

Marks: 1 (Budgeted Time 1 Min)

The graph of an even function is symmetrical about -----

Answer (Please select your correct option)

VuAnswers.com

☐ x-axis

☐

☐ y-axis

☒

correct

☐ origin

☐

Made by: Waqar Siddhu

Question No : 9 of 52

Marks: 1 (Budgeted Time 1 Min)

The function $f(x) = x^2 \cos 2x$ is -----

Answer (Please select your correct option)

VuAnswers.com

☐ Neither even nor odd

☐ Odd function

☒ Even function

correct

Made by: Waqar Siddhu

Question No : 8 of 52

Marks: 1 (Budgeted Time 1 Min)

Let L denotes the Laplace Transform.

According to First Shift Theorem, if $L\{F(t)\} = f(s)$ then which of the following equation holds?

s and a are constants.

Answer (Please select your correct option)

VuAnswers.com

☐ $L\{e^{-at}F(t)\} = f(s+a)$

☐ $L\{e^{-at}F(t)\} = f(s)$

☐ $L\{e^{-at}F(t)\} = f(a)$

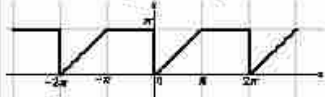
☐ $L\{e^{-at}F(t)\} = f(s-a)$

Made by: Waqar Siddhu

Question No : 7 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of periodic function whose graph is as below?



Answer (Please select your correct option)

VuAnswers.com

☐ π

☐ $-\pi$

correct

☐ 2π

☐ -2π

Made by: Waqar Siddhu

Question No : 6 of 52

Marks: 1 (Budgeted Time 1 Min)

Which of the following condition must be satisfied for a vector field $\vec{F}$ to be a conservative vector field?

Answer (Please select your correct option)

VuAnswers.com

☐ Line integral of $\vec{F}$ along a curve, depends only on the endpoints of that curve, not on the particular route taken.

☐ Divergence of $\vec{F}$ should be zero

☐ Gradient of $\vec{F}$ should be zero.

☐ $\vec{F} = 0$

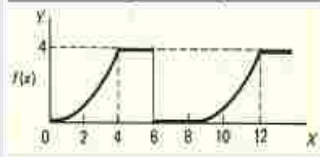
correct

Made by: Waqar Siddhu

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of periodic function whose graph is as below?



Answer (Please select your correct option)

VuAnswers.com

☐ 0

☐ 4

☐ 4

☐ 6

☐ 6

☐ 8

☒ 8

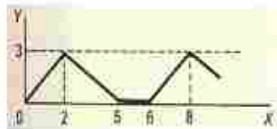
correct

Made by: Waqar Siddhu

Question No : 4 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of periodic function whose graph is as below?



Answer (Please select your correct option)

VuAnswers.com

2

☐

5

☐

6

☒

correct

8

☐

Made by: Waqar Siddhu

Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)

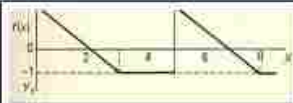
Match the following periodic function with its graph.

$$f(x) = \begin{cases} 2-x & 0 \leq x < 3 \\ -1 & 3 < x < 5 \end{cases}$$

Answer (Please select your correct option)

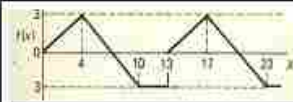
VuAnswers.com

☒

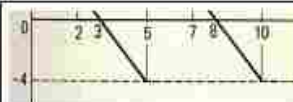


correct

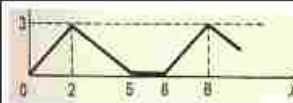
☐



☐



☐



Made by: Waqar Siddhu

Question No : 2 of 52

Marks: 1 (Budgeted Time 1 Min)

What is the period of a periodic function defined by $f(x) = 4 \cos 3x$?

Answer (Please select your correct option)

VuAnswers.com

☐ $\frac{\pi}{4}$

☐ $\frac{\pi}{3}$

☒ $\frac{2\pi}{3}$

correct

☐ π

Made by: Waqar Siddhu

Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

A vector field is a vector each of whose components is a scalar field

Answer (Please select your correct option)

[VuAnswers.com](https://vuanswers.com)

True

☒

correct

False

☐

Made by: Waqar Siddhu

Question No : 47 of 52

Marks: 3 (Budgeted Time 6 Min)

Determine the Fourier co-efficient a_0 of the periodic function defined below:

$$f(x) = 2x + 1 \quad 0 < x < 2$$

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 47 of 52

Marks: 3 (Budgeted Time 6 Min)

Determine the Fourier co-efficient a_0 of the periodic function defined below:

$$f(x) = 2x + 1 \quad 0 < x < 2$$

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 52 of 52

Marks: 5 (Budgeted Time 10 Min)

Consider the point $(-5, 5, 6)$ in rectangular coordinate system. Convert it into Spherical coordinates.

Answer (Please [click here](#) to Add Answer)

VuAnswers.com



Made by: Waqar Siddhu

Question No : 20 of 52

Marks: 1 (Budgeted Time 1 Min)

In three dimensional space, the equation $y = x^2$ always represents

Answer (Please select your correct option)

VuAnswers.com

☒ Parabola

correct

☐ Straight line

☐ Half cylinder

☐ Cone

Made by: Waqar Siddhu

Question No : 1 of 52

Marks: 1 (Budgeted Time 1 Min)

Which one of the following is correct Wallis Sine formula when n is odd and $n \geq 3$?

Answer (Please select your correct option)

VuAnswers.com

☐ $\int_0^{\pi/2} \sin^n x \, dx = \frac{\pi}{2} \frac{(n-1)}{n} \frac{(n-3)}{(n-2)} \frac{(n-5)}{(n-4)} \dots \frac{5}{6} \frac{3}{4} \frac{1}{2}$

☐ $\int_0^{\pi/2} \sin^n x \, dx = \frac{\pi}{2} \frac{(n)}{(n-1)} \frac{(n-2)}{(n-3)} \frac{(n-4)}{(n-5)} \dots \frac{6}{5} \frac{4}{3} \frac{2}{1}$

☐ $\int_0^{\pi/2} \sin^n x \, dx = \frac{(n-1)}{n} \frac{(n-3)}{(n-2)} \frac{(n-5)}{(n-4)} \dots \frac{6}{7} \frac{4}{5} \frac{2}{3}$

correct

☐ $\int_0^{\pi/2} \sin^n x \, dx = \frac{(n)}{(n-1)} \frac{(n-2)}{(n-3)} \frac{(n-4)}{(n-5)} \dots \frac{6}{5} \frac{4}{3} \frac{2}{1}$

Made by: Waqar Siddhu