Question No : 1 of 26 Marks: 1 (Budgeted Time 1 Min)

An ordered pair corresponds to ---------- on the plane

Answer (Please select your correct option)

- A unique point correct
- A point in each quadrant
- Two points
- Infinite number of points

Question No : 2 of 26 Marks: 1 (Budgeted Time 1 Min)

Plane is a special type of ----------.

Answer (Please select your correct option)

- Curve
- Surface

correct

- Sphere
- Cone

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Question No : 3 of 26 Marks: 1 (Budgeted Time 1 Min)

There is one-to-one correspondence between the set of points on a co-ordinate line and ----------

Answer (Please select your correct option)

- Set of real numbers correct
- Set of integers
- Set of natural numbers
- Set of rational numbers

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Question No : 4 of 26 Marks: 1 (Budgeted Time 1 Min)

What is the general equation of parabola whose axis of symmetry is parallel to y-axis?

Answer (Please select your correct option)

- $y = ax^2 + b \quad (a \neq 0)$
- $x = ay^2 + b \quad (a \neq 0)$
- $y = ax^2 + bx + c \quad (a \neq 0)$ correct
- $x = ay^2 + by + c \quad (a \neq 0)$

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Question No : 5 of 26 Marks: 1 (Budgeted Time 1 Min)

If the spherical coordinates of a point are $\left(2, \frac{\pi}{4}, 0\right)$, then z-coordinate in rectangular coordinate system is . . . . . .

Answer (Please select your correct option)

- 0
- -2
- 2
- $\sqrt{2}$

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Question No : 6 of 26 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)

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

correct

- approaches towards zero

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Question No : 7 of 26 Marks: 1 (Budgeted Time 1 Min)

The function $f(x, y) = \sqrt{y - x}$ is continuous in the region --------- and discontinuous elsewhere.

Answer (Please select your correct option)

- $x \geq y$
- $x \neq y$
- $x \leq y$
- $x > y$

correct

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Question No : 8 of 26 Marks: 1 (Budgeted Time 1 Min)

Let $w = f(x, y, z)$ and $x = g(r, s)$, $y = h(r, s)$, $z = t(r, s)$ then by chain rule $\frac{\partial w}{\partial r}$ = ...

Answer (Please select your correct option)

- $\frac{\partial w}{\partial x}\frac{\partial x}{\partial r} + \frac{\partial w}{\partial y}\frac{\partial y}{\partial r} + \frac{\partial w}{\partial z}\frac{\partial z}{\partial r}$
- $\frac{\partial w}{\partial r}\frac{\partial x}{\partial r} + \frac{\partial w}{\partial r}\frac{\partial y}{\partial r} + \frac{\partial w}{\partial r}\frac{\partial z}{\partial r}$
- $\frac{\partial w}{\partial x}\frac{\partial x}{\partial r}\frac{\partial x}{\partial s} + \frac{\partial w}{\partial y}\frac{\partial y}{\partial r}\frac{\partial y}{\partial s} + \frac{\partial w}{\partial z}\frac{\partial z}{\partial r}\frac{\partial z}{\partial s}$
- $\frac{\partial w}{\partial r}\frac{\partial r}{\partial x} + \frac{\partial w}{\partial r}\frac{\partial r}{\partial y} + \frac{\partial w}{\partial r}\frac{\partial r}{\partial z}$

Question No : 9 of 26 Marks: 1 (Budgeted Time 1 Min)

Every differentiable function is always . . . . . .

Answer (Please select your correct option)

- Piece wise continuous
- Discontinuous
- Continuous

correct

Question No : 10 of 26 Marks: 1 (Budgeted Time 1 Min)

The vector $\vec{a} \times \vec{b}$ is . . . . . to both $\vec{a}$ and $\vec{b}$.

Answer (Please select your correct option)

- Opposite
- Equal
- Parallel

correct

- Orthogonal

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Question No : 11 of 26 Marks: 1 (Budgeted Time 1 Min)

Gradient of a scalar function always results in a . . . . . function.

Answer (Please select your correct option)

- Scalar
- Continuous
- Vector

correct

- Constant

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Question No : 12 of 26 Marks: 1 (Budgeted Time 1 Min)

Tthe direction of gradient at any point on the surface is . . . . . to the tangent plane at that point.

Answer (Please select your correct option)

- parallel
- perpendicular

correct

- opposite direction
- None of these.

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Question No : 13 of 26 Marks: 1 (Budgeted Time 1 Min)

$f_x(p_o)(x - x_o) + f_y(p_o)(y - y_o) + f_z(p_o)(z - z_o) = 0$ is the equation of . . . . . .

Answer (Please select your correct option)

- Normal plane
- Point slope form of line
- Gradient of function $f(x, y, z)$
- Tangent plane

correct

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Question No : 14 of 26 Marks: 1 (Budgeted Time 1 Min)

For a function $z = f(x, y)$, the total differential is defined as . . . . . .

Answer (Please select your correct option)

- $dz = f_x(x,y)dx - f_y(x,y)dy$
- $dz = f_x(x,y)dx + f_y(x,y)dy$

correct

- $dz = f_x(x,y)dy - f_y(x,y)dx$
- $dz = f_x(x,y)dy + f_y(x,y)dx$

Question No : 15 of 26 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)

- a closed and bounded — correct
- an open and bounded
- a closed and unbounded
- an open and unbounded

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Question No : 16 of 26 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- $V = x^2y^2z^2$
- $V = x + y + z$
- $V = \sqrt{xyz}$
- $V = xyz$

correct

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Question No : 17 of 26 Marks: 1 (Budgeted Time 1 Min)

Let x be the length, width and height of a cube. The area of bottom will be . . . . . .

Answer (Please select your correct option)

- $A = x^2$
- $A = x^3$ correct
- $A = xz$
- $A = x + x^2$

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Question No : 18 of 26 Marks: 1 (Budgeted Time 1 Min)

A double integral and iterated integral become identical provided that the integrand is . . . . . over the given rectangular region.

Answer (Please select your correct option)

- Bounded

correct

- Discontinuous
- Continuous
- Defined

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Question No : 19 of 26 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- $\int_0^1 \int_2^4 (4xe^{2y})dydx$
- $\int_0^1 \int_2^4 (4xe^{2y})dxdy$ correct
- $\int_1^4 \int_0^2 (4xe^{2y})dxdy$
- $\int_1^4 \int_0^2 (4xe^{2y})dydx$

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Question No : 20 of 26 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- $\int_0^2 \int_0^3 (1 - ye^{xy}) dy dx$ correct
- $\int_0^2 \int_0^3 (1 - ye^{xy}) dx dy$
- $\int_2^3 \int_0^0 (1 - ye^{xy}) dx dy$
- $\int_0^2 \int_2^3 (4xe^{2y}) dy dx$

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Question No : 21 of 26 Marks: 2 (Budgeted Time 4 Min)

Write down the equation of a plane passing through the point $(2, -3, 1)$ and perpendicular to the vector $\vec{n} = 16\hat{i} + 6\hat{j} + 6\hat{k}$.

Answer (Please click here to Add Answer)

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Question No : 22 of 26 Marks: 2 (Budgeted Time 4 Min)

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

Answer (Please click here to Add Answer)

Question No : 23 of 26 Marks: 3 (Budgeted Time 6 Min)

Find the critical points for the function. $f(x,y)$ where as $f_x = 2x + y$ and $f_y = 2y + x$.

Answer (Please click here to Add Answer)

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Question No : 24 of 26 Marks: 3 (Budgeted Time 6 Min)

Evaluate the following double integral.

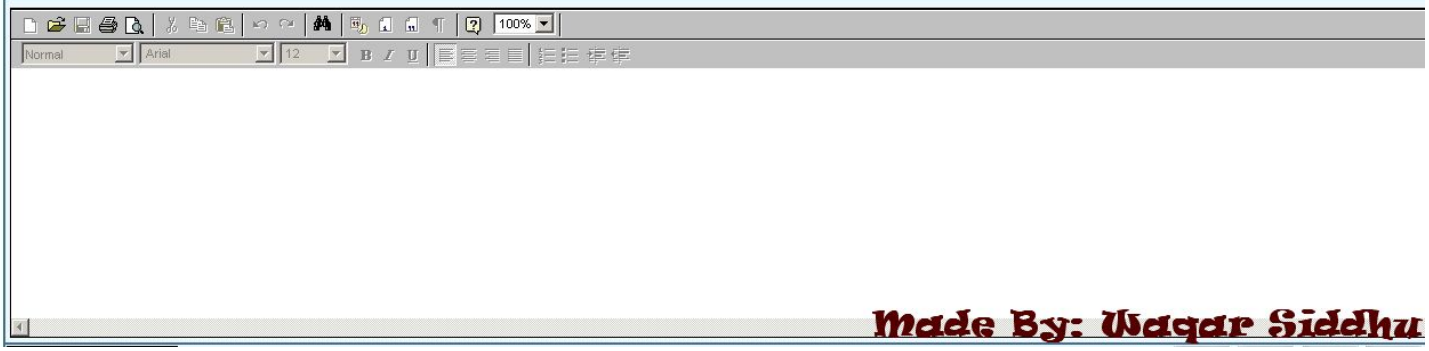
$$\iint \left(3 + 2x - 3y^2\right) dx\, dy$$

Answer (Please click here to Add Answer)

Question No : 25 of 26 Marks: 5 (Budgeted Time 10 Min)

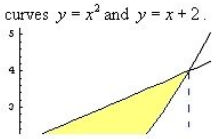
Consider a function $f(x,y) = x^3 - 3xy + y^3$. One of its critical point is $(1, 1)$. Find, whether $f(x,y)$ has relative maxima, relative minima or saddle point at $(1, 1)$.

Answer (Please click here to Add Answer)



Question No : 26 of 26 Marks: 5 (Budgeted Time 10 Min)

Use double integral in rectangular co-ordinates to compute area of the region bounded by the curves $y = x^2$ and $y = x + 2$.



Answer (Please click here to Add Answer)

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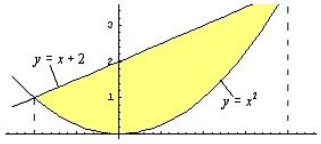
Question No : 26 of 26 Marks: 5 (Budgeted Time 10 Min)



Answer (Please click here to Add Answer)

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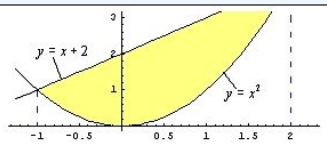
Question No : 26 of 26 Marks: 5 (Budgeted Time 10 Min)



Answer (Please click here to Add Answer)

100%

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