

Question No : 1 of 26

Marks: 1 (Budgeted Time 1 Min)

Intersection of two straight lines is a -----

Answer (Please select your correct option)

☐ Surface

☐ Curve

☐ Plane

☐ Point

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Question No : 2 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
- ☐ A point in each quadrant
- ☐ Two points
- ☐ Infinite number of points

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Question No : 3 of 26

Marks: 1 (Budgeted Time 1 Min)

If $f(x, y, z) = \frac{x^2 y}{z} + xyz$

then what is the value of $f(1, 1, 1)$?

Answer (Please select your correct option)

☐ $f(1, 1, 1) = 1$

☐ $f(1, 1, 1) = 2$

☐ $f(1, 1, 1) = 3$

☐ $f(1, 1, 1) = 4$

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Question No : 4 of 26

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)

☐ $x^2 + y^2 = a^2$

☐ $x^2 + y^2 \geq a^2$

☐ $x^2 + y^2 \leq a^2$

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Question No : 5 of 26

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)

☐ $y < x^2$

☐ $y \geq x^2$

☐ $y \neq x^2$

☐

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Question No : 6 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)

☐ $x \geq y$

☐ $x \neq y$

☐ $x \leq y$

☐ $x > y$

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Question No : 7 of 26

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)

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

☐ $\frac{\partial f}{\partial x} = 3x^2 e^{xy} + x^4 e^{xy}$

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

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

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Question No : 7 of 26

Marks: 1 (Budgeted Time 1 Min)

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

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

☐ $\frac{\partial f}{\partial x} = 3x^2 e^{xy} + x^4 e^{xy}$

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

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

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Question No : 8 of 26

Marks: 1 (Budgeted Time 1 Min)

Given that $f(x, y) = xy + 2$. For finding $\frac{\partial f}{\partial x}$, y will be considered as

Answer (Please select your correct option)

☐ Zero

☐ a variable

☐ Non-zero constant

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Question No : 9 of 26

Marks: 1 (Budgeted Time 1 Min)

If $w = f(z)$ and $z = g(r, s)$, then $\frac{\partial w}{\partial s} = \dots\dots\dots$

Answer (Please select your correct option)

☐ $\frac{\partial w}{\partial s} \frac{\partial s}{\partial z}$

☐ $\frac{\partial w}{\partial z} \cdot \frac{\partial z}{\partial r} \cdot \frac{\partial r}{\partial s}$

☐ $\frac{\partial w}{\partial z} \cdot \frac{\partial z}{\partial s}$

☐ $\frac{\partial w}{\partial z} \frac{\partial z}{\partial r} + \frac{\partial w}{\partial z} \frac{\partial z}{\partial s}$

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Question No : 10 of 26

Marks: 1 (Budgeted Time 1 Min)

If $w = f(x, y, z)$ where $x = g(r, s)$, $y = h(r, s)$, $z = k(r, s)$ then r and s are called

Answer (Please select your correct option)

☐ Independent variables

☐ Dependent variables

☐ Intermediate variables

☐ None of these

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Question No : 11 of 26

Marks: 1 (Budgeted Time 1 Min)

The formula used for finding the Volume of a parallelepiped with adjacent edges formed by the vectors \vec{a} , \vec{b} and \vec{c} is given by

Answer (Please select your correct option)

☐ $|\vec{a} \times (\vec{b} \times \vec{c})|$

☐ $|\vec{a} \cdot (\vec{b} \cdot \vec{c})|$

☐ $|\vec{a} \cdot (\vec{b} \times \vec{c})|$

☐ $|\vec{a} \times (\vec{b} \cdot \vec{c})|$

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Question No : 12 of 26

Marks: 1 (Budgeted Time 1 Min)

Directional derivative of a function $f(x,y)$ in the direction of \vec{u} in a more compact form can be written as

Answer (Please select your correct option)

☐ $\nabla f(x,y) \times \vec{u}$

☐ $\nabla f(x,y) \vec{u}$

☐ $\nabla f(x,y) u$

☐ $\vec{u} \times \nabla f(x,y)$

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Question No : 13 of 26

Marks: 1 (Budgeted Time 1 Min)

The 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

☐ opposite direction

☐ None of these.

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Question No : 14 of 26

Marks: 1 (Budgeted Time 1 Min)

By Extreme Value Theorem, if a function $f(x,y)$ is continuous on a closed and bounded set R , then $f(x,y)$ has both ----- on R .

Answer (Please select your correct option)

☐ Absolute maximum and absolute minimum value

☐ Relative maximum and relative minimum value

☐ Absolute maximum and saddle point

☐ Relative minimum and saddle point

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Question No : 15 of 26

Marks: 1 (Budgeted Time 1 Min)

If $f(x, y)$ has a relative extremum at a point (x_0, y_0) and both the first partial derivatives of f exist at this point, then

Answer (Please select your correct option)

☐ $f_x(x_0, y_0) = 0$ and $f_y(x_0, y_0) \neq 0$

☐ $f_x(x_0, y_0) \leq 0$ and $f_y(x_0, y_0) \leq 0$

☐ $f_x(x_0, y_0) \geq 0$ and $f_y(x_0, y_0) \geq 0$

☐ $f_x(x_0, y_0) = 0$ and $f_y(x_0, y_0) = 0$

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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)

☐ $V = x^2 y^2 z^2$

☐ $V = x + y + z$

☐ $V = \sqrt{xyz}$

☐ $V = xyz$

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Question No : 17 of 26

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)

☐ $A = yz$

☐ $A = xz$

☐ $A = xy$

☐ $A = xyz$

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Question No : 18 of 26

Marks: 1 (Budgeted Time 1 Min)

For the double integral $\int_a^b \int_c^d f(x,y) dx dy$, order of integration does not matter provided that $f(x,y)$ is

Answer (Please select your correct option)

☐ Bounded

☐ Discontinuous

☐ Defined

☐ Continuous

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Question No : 19 of 26

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

☐ $\int_{-1}^1 \int_0^2 (x + 2y^2) dy dx$

☐ $\int_0^2 \int_{-1}^1 (x + 2y^2) dx dy$

☐ $\int_{-1}^1 \int_0^2 (x + 2y^2) dx dy$

☐ $\int_1^2 \int_{-1}^0 (x + 2y^2) dx dy$

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Question No : 20 of 26

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)

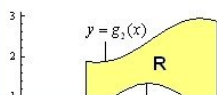
- ☐ Area of R .
- ☐ Radius of inscribed circle in R .
- ☐ Distance between two endpoints of R .
- ☐ None of these

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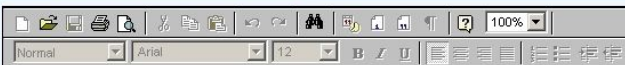
Question No : 22 of 26

Marks: 2 (Budgeted Time 4 Min)

Let the function $f(x,y)$ is continuous in the region R shown below.



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



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Marks: 3 (Budgeted Time 6 Min)

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

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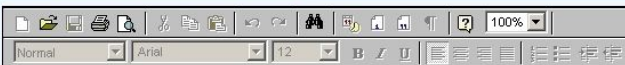
Question No : 24 of 26

Marks: 3 (Budgeted Time 6 Min)

Evaluate the following double integral.

$$\iint (2xy + y^3) \, dx \, dy$$

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



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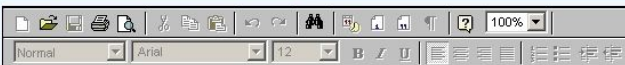
Question No : 25 of 26

Marks: 5 (Budgeted Time 10 Min)

Find all critical points of the function

$$f(x, y) = 3x^2 + 2xy + y^2$$

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

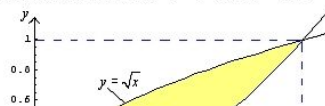


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Question No : 26 of 26

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 $y = \sqrt{x}$.



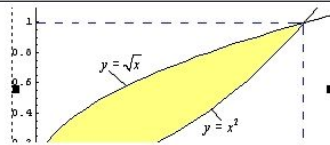
Answer ([Please click here to Add Answer](#))



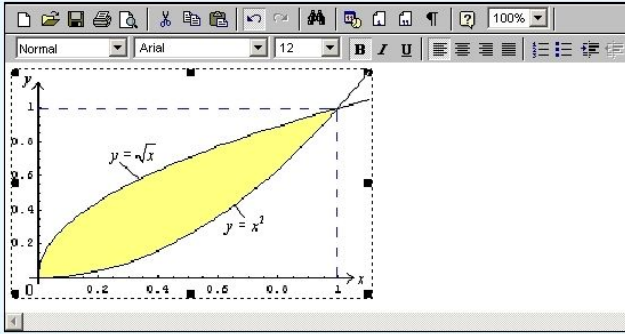
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Marks: 5 (Budgeted Time 10 Min)



Answer (Please Add Answer) (Use ctrl+C and ctrl+V to copy & paste)



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