Given that $w = x^2 + y^2 + z^2$ and $z(x, y)$ satisfies $z^3 - xy + yz + y^3 = 1$. Then choose the correct option(s).

Select one or more:

- [ ] a. $\frac{\partial w}{\partial x}$ at $(2, -1, 1)$ is -3
- [x] b. $\frac{\partial w}{\partial y}$ at $(2, -1, 1)$ is -4
- [x] c. $\frac{\partial w}{\partial y}$ at $(2, -1, 1)$ is 4
- [ ] d. $\frac{\partial w}{\partial x}$ at $(2, -1, 1)$ is 3

Your answer is incorrect.

The correct answers are: $\frac{\partial w}{\partial x}$ at $(2, -1, 1)$ is 3

, $\frac{\partial w}{\partial y}$ at $(2, -1, 1)$ is -4

Question 2

Correct

Mark 2.00 out of 2.00

Flag question

For what values of a, b, c the directional derivative of $\phi(x, y, z) = axy + byz + cxz$ at $(1, 1, 1)$ has the maximum magnitute 4 in the direction parallel to X-axis.

Select one:

- a. $a = -2, b = 2, c = -2$
- b. $a = 2, b = 2, c = 2$
- c. $a = 2, b = -2, c = 2$ ✓
- d. $a = 1, b = -1, c = 1$

Your answer is correct.

The correct answer is: $a = 2, b = -2, c = 2$

Question 3

Incorrect

Mark 0.00 out of 2.00

Flag question

For $\alpha \in \mathbb{R}$, defined

$$f(x,y) = \begin{cases} \dfrac{|x|^{\alpha} x^2 y}{x^4 + y^2}, & (x,y) \neq (0,0) \\ 0, & x = y = 0 \end{cases}.$$

Then at $(0,0)$ the function f is

Select one:

- a. differentiable for $\alpha = 0$.
- b. continuous for $\alpha = 1$.
- c. continuous for $\alpha = 0$.
- d. continuous for $\alpha = -2$.

Your answer is incorrect.

The correct answer is: continuous for $\alpha = 1$.

Question 4

Incorrect

Mark 0.00 out of 2.00

Flag question

Let $f(x,y) \equiv x^3y^2 + x^2 - y^2$. Then choose the correct option(s).

Select one or more:

- [ ] a. The function has exactly two critical points.
- [ ] b. $(0,0)$ is a local maxima point.
- [x] c. $\left(1, \sqrt{\frac{2}{3}}\right)$ is a saddle point. ✓
- [x] d. $\left(1, -\sqrt{\frac{2}{3}}\right)$ is a local minima point. ✗

Your answer is incorrect.

The correct answers are: $\left(1, \sqrt{\frac{2}{3}}\right)$ is a saddle point.

, $(0,0)$ is a local maxima point.

Choose the correct option(s).

Select one or more:

- [ ] a. If $z = xy + x + y + 1, x = \cos t, y = \sin t,$ then $\frac{dz}{dt}$ at $t = \frac{\pi}{4}$ is 2.

- [x] b. If $\lim_{(x,y)\to(0,0)} f(x,y) = l$ and $l \in \mathbb{R}$, then $\lim_{x\to 0}\lim_{y\to 0} f(x,y)$ may not exist. ✓

- [x] c. The existence of partial derivatives does not guarantee the existence of directional derivatives in all directions. ✓

- [ ] d. $\lim_{(x,y)\to(0,0)} \frac{(x-y^2)^8}{x^8+y^{16}}$ exists.

Your answer is correct.

The correct answers are: The existence of partial derivatives does not guarantee the existence of directional derivatives in all directions., If $\lim_{(x,y)\to(0,0)} f(x,y) = l$ and $l \in \mathbb{R}$, then $\lim_{x\to 0}\lim_{y\to 0} f(x,y)$ may not exist.