Question 1

Incorrect

Mark 0.00 out of 2.00

Choose the **incorrect** option.

Select one:

a. $\int_1^{\infty} \frac{dx}{x^3} = -\frac{1}{2}$

b. $\int_{\pi}^{\infty} \frac{\sin x}{x} dx$ converges.

c. $\int_1^{\infty} \frac{dx}{(x^2 + 2x + \sin^2 x)(e^x + 1)}$ converges.

d. $\int_0^1 \frac{\cos x}{x^2} dx$ converges.

Your answer is incorrect.

The correct answer is: $\int_0^1 \frac{\cos x}{x^2} dx$ converges.

Question 2

Incorrect

Mark 0.00 out of 2.00

Series $\sum_{n=2}^{\infty} \frac{1}{(n-1)(n+2)}$

Select one:

- a. diverges.
- b. converges to 0.
- c. converges to $\frac{1}{2}$.
- d. converges to $\frac{11}{2}$.

Your answer is incorrect.

The correct answer is: converges to $\frac{11}{2}$.

Question 3

Incorrect

Mark 0.00 out of 2.00

Sequence $\{\frac{\sin(n)\cos(n)}{n}\}$

Select one:

- a. converges to -1.
- b. diverges.
- c. converges to **0**.
- d. converges to 1.

✗

Your answer is incorrect.

The correct answer is:

converges to **0**.

Question 4

Correct

Mark 3.00 out of 3.00

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

Select one or more:

- [x] a. $\left(1, -\frac{1}{2}\right)$ is a saddle point.
- [x] b. $\left(-1, \frac{1}{2}\right)$ is a local maximum point.
- [ ] c. $\left(-1, -\frac{1}{2}\right)$ is a local minimum point.
- [ ] d. The function has exactly four critical points.

Your answer is correct.

The correct answers are: $\left(-1, \frac{1}{2}\right)$ is a local maximum point.

, $\left(1, -\frac{1}{2}\right)$ is a saddle point.

Question 5

Incorrect

Mark 0.00 out of 2.00

Which among the following is the **correct** expression for the integral $\int_0^{\frac{12}{5}} \int_y^{6-\frac{3}{2}y} f(x,y)\,dx\,dy$, when the order of integration is reversed?

Select one:

a. $\int_0^{\frac{12}{5}} \int_0^{\frac{12}{5}} f(x,y)\,dy\,dx$

b. $\int_0^{6} \int_0^{\frac{12}{5}} f(x,y)\,dy\,dx$

c. $\int_0^{\frac{12}{5}} \int_0^{y} f(x,y)\,dy\,dx + \int_{\frac{12}{5}}^{6} \int_0^{6-\frac{3}{2}y} f(x,y)\,dy\,dx$

d. $\int_0^{\frac{12}{5}} \int_0^{x} f(x,y)\,dy\,dx + \int_{\frac{12}{5}}^{6} \int_0^{4-\frac{2}{3}x} f(x,y)\,dy\,dx$

Your answer is incorrect.

The correct answer is: $\int_0^{\frac{12}{5}} \int_0^{x} f(x,y)\,dy\,dx + \int_{\frac{12}{5}}^{6} \int_0^{4-\frac{2}{3}x} f(x,y)\,dy\,dx$

Question 6

Correct

Mark 2.00 out of 2.00

Determine the first degree Taylor's polynomial approximation of the function $f(x, y) = 3 \sin 2x + 2 \cos 3y$ near the origin.

Select one:

- a. $6x - 1$
- b. $2 + 2x$
- c. $2 + 6x$ ✓
- d. $1 + 6x$

Your answer is correct.

The correct answer is: $2 + 6x$

Question 7

Correct

Mark 2.00 out of 2.00

Evaluate the double integral $\iint_R x^2 \, dA$, where R is the region bounded by $y = x^2$ and $x = y^2$.

Select one:

- a. $\frac{3}{35}$
- b. $-\frac{3}{35}$ ✓
- c. $\frac{1}{3}$
- d. $-\frac{1}{3}$

Your answer is correct.

The correct answer is: $-\frac{3}{35}$

Question 8

Partially correct

Mark 1.50 out of 3.00

Choose the correct option(s).

Select one or more:

- [x] a. The function $f(x,y)=\begin{cases} x\ \sin\left(\frac{1}{y}\right)+y\sin\left(\frac{1}{x}\right), & xy\neq 0 \\ 0, & xy=0 \end{cases}$ is continuous at every point of $\mathbb{R}^2$.
- [ ] b. Partial derivatives of a continuous function always exist.
- [x] c. The existence of partial derivatives does not guarantee the existence of directional derivatives in all directions.
- [x] d. $\lim\limits_{(x,y)\to(1,0)}\dfrac{x^2-y^2}{x^2+y^2}$ does not exist.

Your answer is partially correct.

You have selected too many options.

The correct answers are: The existence of partial derivatives does not guarantee the existence of directional derivatives in all directions., The function $f(x,y)=\begin{cases} x\ \sin\left(\frac{1}{y}\right)+y\sin\left(\frac{1}{x}\right), & xy\neq 0 \\ 0, & xy=0 \end{cases}$ is continuous at every point of $\mathbb{R}^2$.

Question 9

Correct

Mark 2.00 out of 2.00

Find 1.37-neighbourhood of point -0.57 $(V_{1.37}(-0.57))$.

Select one:

- a. $(-2, -1.80)$
- b. $(-1.94, 0.80)$ ✓
- c. $(-1.94, -0.80)$
- d. $(1.94, -0.80)$

Your answer is correct.

The correct answer is: $(-1.94, 0.80)$

Question 10

Correct

Mark 3.00 out of 3.00

Choose the **correct** options from below:

Select one or more:

- [ ] a.
  Every Cauchy sequence is bounded but need not be convergent.
- [x] b.
  Every Cauchy sequence is convergent. ✓
- [ ] c.
  A Cauchy sequence need not be convergent.
- [x] d.
  Every convergent sequence is Cauchy. ✓

Your answer is correct.

The correct answers are:

Every Cauchy sequence is convergent.,

Every convergent sequence is Cauchy.

Question 11

Incorrect

Mark 0.00 out of 2.00

The function f satisfies the following relationship.

$$f(x) = \int_1^x [f(t)]^2 dt, f(3) = \frac{1}{3}.$$

Then determine the value of $f(1)$.

Select one:

a. 0

b. $\frac{1}{5}$

c. 1

d. $\frac{1}{7}$

Your answer is incorrect.

The correct answer is: $\frac{1}{5}$

Question 12

Incorrect

Mark 0.00 out of 2.00

Evaluate $\displaystyle\oint_C3y~dx+2x~dy$, where C is the triangle bounded by $x=0$, $x+y=1$ and $y=0$.

Select one:

- a. $\displaystyle\frac{1}{2}$
- b. $\displaystyle 0$ ✗
- c. $\displaystyle -2$
- d. $\displaystyle-\frac{1}{2}$

Your answer is incorrect.

The correct answer is: $\displaystyle-\frac{1}{2}$

Question 13

Correct

Mark 2.00 out of 2.00

Consider bounded sets A and B such that $B\subset A$. Then

Select one:

a.
$\sup(B)< \sup(A)$ and $\inf(A)=\inf(B)$

b.
$\sup(B)\leq \sup(A)$ and $\inf(A)\leq \inf(B)$

✓

c.
$\sup(B)>\sup(A)$ and $\inf(A)> \inf(B)$

d.
$\sup(B)= \sup(A)$ and $\inf(A)< \inf(B)$

Your answer is correct.

The correct answer is:

$\sup(B)\leq \sup(A)$ and $\inf(A)\leq \inf(B)$

Question 14

Correct

Mark 2.00 out of 2.00

Let $\displaystyle z=x^2y+2xy+3$ and $x=\cos2t, y=\sin2t$. Then what is the value of $\displaystyle\frac{dz}{dt}$ at $\displaystyle t=\frac{\pi}{4}$?

Select one:

- a. $\displaystyle 4$
- b. $\displaystyle -4$ ✓
- c. $\displaystyle 0$
- d. $\displaystyle\frac{5}{\sqrt{2}}$

Your answer is correct.

The correct answer is: $\displaystyle -4$

Question 15

Correct

Mark 3.00 out of 3.00

Let $\displaystyle f(x,y)=4xy$ subject to the constraint $x^2+y^2=8$. Then

Select one or more:

- [x] a. $\displaystyle \left(-2,-2\right)$ is a point of maximum.
- [ ] b. there are exactly two critical points of the function.
- [ ] c. $\displaystyle\left(2,2\right)$ is a point of minimum.
- [x] d. $\displaystyle 16$ is the maximum value.

Your answer is correct.

The correct answers are: $\displaystyle \left(-2,-2\right)$ is a point of maximum.

, $\displaystyle 16$ is the maximum value.

Question 16

Correct

Mark 2.00 out of 2.00

Taylor series of $\frac{1}{x}$ about $c=-1$ is given by

Select one:

a. $-1-(x-1)-(x-1)^2-(x-1)^3-\ldots$

b. $1-(x+1)+(x+1)^2-(x+1)^3+\ldots$

c. $1+(x+1)+(x+1)^2+(x+1)^3-\ldots$

d. $-1-(x+1)-(x+1)^2-(x+1)^3-\ldots$

Your answer is correct.

The correct answer is: $-1-(x+1)-(x+1)^2-(x+1)^3-\ldots$

Question 17

Correct

Mark 2.00 out of 2.00

Which of the following is an improper integral of second kind?

(I) $\displaystyle\int_{0}^1\frac{dx}{x^2}$

(II) $\displaystyle\int_2^3\frac{dx}{x^2-25}$

(III) $\displaystyle\int_0^1\tan\left(\frac{\sqrt x}{2}\right)dx$

Select one:

- a. II and III only
- b. I only
- c. III only
- d. I and III only ✗

Your answer is correct.

The correct answer is: I only

Question 18

Correct

Mark 2.00 out of 2.00

\(\displaystyle\lim_{x\rightarrow\infty}x^2(e^{-\frac{1}{x^2}}-1)\)

Select one:

- a. \(\infty\)
- b. \(0\)
- c. \(1\)
- d. \(-1\)

Your answer is correct.

The correct answer is: \(-1\)