Assignment 0

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2019-02-04, 23:59 IST.

1) If \( y = 1 + x + x^2 + \cdots \), then \( \frac{dy}{dx} = \) ____________.

a. \( \frac{1}{(1-x)^2} \)
b. \( \frac{1}{1-x^2} \)
c. \( \frac{2}{(1-x)^2} \)
d. \( -\frac{2}{(1-x)^2} \)

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

d.

2) For the given relation \( \sqrt{1-x^2} + \sqrt{1-y^2} = p(x-y) \), where \( p \) is a constant, the value of \( \frac{dy}{dx} \) at \( (0,0) \) is

a. \( -1 \)
b. \( 0 \)
c. \( 1 \)
d. \( -2 \)

No, the answer is incorrect.

Score: 0

Accepted Answers:

c.

3) ____________.
\[ \int_{1}^{2} \frac{\sqrt{1 + x^2}}{x} \, dx = \] __________.

a. \( \ln \left( \frac{1 + \sqrt{2}}{1 + \sqrt{3}} \right) + \ln 2 - \sqrt{2} + \sqrt{5} \)

b. \( \ln \left( \frac{1 + \sqrt{2}}{1 + \sqrt{3}} \right) + \ln 2 - \sqrt{2} + \sqrt{5} \)

c. \( \ln \left( \frac{1 - \sqrt{2}}{1 - \sqrt{3}} \right) + \ln 2 + \sqrt{2} + \sqrt{5} \)

d. \( \ln \left( \frac{1 + \sqrt{2}}{1 + \sqrt{3}} \right) + \ln 2 + \sqrt{2} + \sqrt{5} \)

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

4) Let the function \( f \) satisfies
\[ f(x) + 2f \left( \frac{1}{x} \right) = x^2, x \neq 0 \]

The value of the integral \( \int_{1}^{2} x^2 f(x) \, dx \) is

a. \( -\frac{7}{5} \)

b. \( -\frac{7}{3} \)

c. \( \frac{7}{5} \)

d. \( \frac{7}{3} \)

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

5)
The inverse of
\[
\begin{bmatrix}
2 & 2 & 0 \\
-2 & 1 & 1 \\
3 & 0 & 1
\end{bmatrix}
\]
is
a. \[
\begin{bmatrix}
1/12 & 1/6 & 1/6 \\
5/12 & 1/6 & -1/6 \\
-1/4 & 1/2 & 1/2
\end{bmatrix}
\]
b. \[
\begin{bmatrix}
1/12 & -1/6 & 1/6 \\
5/12 & 1/6 & -1/6 \\
-1/4 & 1/2 & 1/2
\end{bmatrix}
\]
c. \[
\begin{bmatrix}
1/12 & -1/6 & 1/6 \\
5/12 & 1/6 & -1/6 \\
1/4 & 1/2 & 1/2
\end{bmatrix}
\]
d. \[
\begin{bmatrix}
1/12 & -1/6 & 1/6 \\
5/12 & 1/6 & 1/6 \\
-1/4 & 1/2 & 1/2
\end{bmatrix}
\]
No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

6) If \( x, y \in \mathbb{R} \), then the determinant value of \( A = \begin{bmatrix} \cos x & -\sin x & 1 \\ \sin x & \cos x & 1 \\ \cos(x + y) & -\sin(x + y) & 0 \end{bmatrix} \) lies in the interval
a. \([-\sqrt{2}, \sqrt{2}]\)
b. \([-\sqrt{2}, 1]\)
c. \([-1, 1]\)
d. \([-\sqrt{2}, -1]\)
No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

7) The minimum and maximum of the function \( f(x) = x^2 - 6x^2 + 9x + 1 \), \( x \in [0, 5] \), attain at \( x = \)____________________ respectively.
a. \(-1 \text{ and } 3\)
b. \(1 \text{ and } 3\)
c. \(1 \text{ and } -3\)
d. \(-1 \text{ and } -3\)
8) Which of the following options hold(s) true for the function

\[ f(x) = \begin{cases} x^2 \sin \left( \frac{1}{x} \right), & \text{if } x \neq 0 \\ 0, & \text{if } x = 0 \end{cases} \]

a. \( \lim_{x \to 0} f(x) = 0 \)
b. \( f \) is differentiable at \( x = 0 \)
c. \( f \) is not differentiable at \( x = 0 \)
d. \( f' \) is continuous at \( x = 0 \)

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

9) The order of the differential equation

\[ \left( \frac{d^2 y}{dx^2} \right)^2 + \left( \frac{d^3 y}{dx^3} \right)^4 + y^2 \sin x = 0 \]

is

a. 2
b. 3
c. 4
d. 6

No, the answer is incorrect.
Score: 0
Accepted Answers:
a. b.

10) Find the value(s) of \( y(1) \) by solving the differential equation

\[ y \frac{dy}{dx} - 6x^2 + 5, y(0) = 2. \]

a. \( \pm \sqrt{2} \)
b. \( 0 \)
c. \( \pm 3\sqrt{2} \)
d. \( \pm 3 \)

No, the answer is incorrect.
Score: 0
Accepted Answers:

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.