



Lakshya JEE (2024)

Application of Derivatives

DPP-07

- The minimum value of $|x| + \left|x + \frac{1}{2}\right| + |x - 3| + \left|x - \frac{5}{2}\right|$ is
 (1) 0 (2) 2
 (3) 4 (4) 6
- One maximum point of $\sin^p x \cos^q x$ is
 (1) $x = \tan^{-1} \sqrt{\left(\frac{p}{q}\right)}$
 (2) $x = \tan^{-1} \sqrt{\left(\frac{q}{p}\right)}$
 (3) $x = \tan^{-1} \left(\frac{p}{q}\right)$
 (4) $x = \tan^{-1} \left(\frac{q}{p}\right)$
- The maximum and minimum values of $\cos^6 \theta + \sin^6 \theta$ are respectively
 (1) 1 and $\frac{1}{4}$ (2) 1 and 0
 (3) 2 and 0 (4) 1 and $\frac{1}{2}$
- Let $f(x) = \begin{cases} |x|, & 0 < |x| \leq 2 \\ 1, & x = 0 \end{cases}$, then at $x = 0$ f has
 (1) A local maximum
 (2) No local maximum
 (3) A local minimum
 (4) No extremum
- The maximum value of $f(x) = \frac{x}{4+x+x^2}$ on $[-1, 1]$ is
 (1) $-\frac{1}{4}$ (2) $-\frac{1}{3}$
 (3) $\frac{1}{6}$ (4) $\frac{1}{5}$
- For $x \in \left(0, \frac{5\pi}{2}\right)$, define $f(x) = \int_0^x \sqrt{t} \sin t \, dt$.
 Then, f has
 (1) Local maximum at π and 2π
 (2) Local minimum at π and 2π
 (3) Local minimum at π and local maximum at 2π
 (4) Local maximum at π and local minimum at 2π
- If $x = -1$ and $x = 2$ are extreme points of $f(x) = a \log|x| + \beta x^2 + x$ then
 (1) $\alpha = 2, \beta = -\frac{1}{2}$ (2) $\alpha = 2, \beta = \frac{1}{2}$
 (3) $\alpha = -6, \beta = \frac{1}{2}$ (4) $\alpha = -6, \beta = -\frac{1}{2}$
- Let $f(x) = x^2 + \frac{1}{x^2}$ and $g(x) = x - \frac{1}{x}$,
 $x \in \mathbb{R} - \{-1, 0, 1\}$. If $h(x) = \frac{f(x)}{g(x)}$, then the local minimum value of $h(x)$ is
 (1) $-2\sqrt{2}$
 (2) $2\sqrt{2}$
 (3) 3
 (4) -3
- The number of critical points for the function $f(x) = 10xe^{3-x^2}$ is
 (1) 0 (2) 1
 (3) 2 (4) 3
- Find the interval for $f(x) = \frac{x^4}{12} - \frac{5x^3}{6} + 3x^2 + 7$ in which it is concave upward.
 (1) $(-\infty, 0) \cup (3, \infty)$
 (2) $(-\infty, 2) \cup (3, \infty)$
 (3) $(-\infty, -1) \cup (1, \infty)$
 (4) None of these



Note: Kindly find the Video Solution of DPPs Questions in the DPPs Section.

Answer Key

1. (4)

2. (1)

3. (1)

4. (1)

5. (3)

6. (4)

7. (1)

8. (2)

9. (3)

10. (2)



PW Web/App - <https://smart.link/7wwosivoicgd4>

Library- <https://smart.link/sdfez8ejd80if>