

Subject: Engineering Mathematics

DPP-05

Chapter: Calculus

Topic : Mean Value Theroem

1. If $f(x) = x^3 - 6x^2 + 11x - 6$ is on $[1, 3]$, then the point $c \leftrightarrow 1, 3$ such that $f'(c) = 0$ is given by
- (a) $c = 2 \pm \frac{1}{\sqrt{2}}$ (b) $c = 2 \pm \frac{1}{\sqrt{3}}$
- (c) $c = 2 \pm \frac{1}{2}$ (d) None of these
2. Let $f(x) = \sin 2x$, $0 \leq x \leq \frac{\pi}{2}$ and $f'(c) = 0$ for $c \leftrightarrow 0, \frac{\pi}{2}$. Then, c is equal to
- (a) $\frac{\pi}{4}$ (b) $\frac{\pi}{3}$
- (c) $\frac{\pi}{6}$ (d) None
3. Let $f(x) = x(x+3)e^{-x/2}$, $-3 \leq x \leq 0$. Let $c \leftrightarrow -3, 0$ such that $f'(c) = 0$. Then, the value of c is
- (a) 3 (b) -3
- (c) -2 (d) -1/2
4. If Rolle's theorem holds for $f(x) = x^3 - 6x^2 + kx + 5$ on $[1, 3]$ with $c = 2 + \frac{1}{\sqrt{3}}$, then value of k is
- (a) -3 (b) 3
- (c) 7 (d) 11
5. A point on the parabola $y = (x-3)^2$, where the tangent is parallel to the chord joining A (3, 0) and B (4, 1) is
- (a) (7, 1) (b) $\left(\frac{3}{2}, \frac{1}{4}\right)$
- (c) $\left(\frac{7}{2}, \frac{1}{4}\right)$ (d) $\left(-\frac{1}{2}, \frac{1}{2}\right)$
6. A point on the curve $y = \sqrt{x-2}$ on $[2, 3]$ where the tangent is parallel to the chord joining the end points of the curve is
- (a) $\left(\frac{9}{4}, \frac{1}{2}\right)$ (b) $\left(\frac{7}{2}, \frac{1}{4}\right)$
- (c) $\left(\frac{7}{4}, \frac{1}{2}\right)$ (d) $\left(\frac{9}{2}, \frac{1}{4}\right)$
7. Let $f(x) = x(x-1)(x-2)$ be defined in $\left[0, \frac{1}{2}\right]$. Then, the value of c of the mean value theorem is
- (a) 0.16 (b) 0.20
- (c) 0.24 (d) None
8. Let $f(x) = \sqrt{x^2 - 4}$ be defined in $[2, 4]$. Then, the value of c of the mean value theorem is
- (a) $-\sqrt{6}$ (b) $\sqrt{6}$
- (c) $\sqrt{3}$ (d) $2\sqrt{3}$

Answer Key

- | | |
|--------|--------|
| 1. (b) | 5. (c) |
| 2. (a) | 6. (a) |
| 3. (c) | 7. (d) |
| 4. (d) | 8. (b) |



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