



Class 12 Mathematics | Applications Of Derivatives

MCQ WORKSHEET • 15 questions • Choose one correct option • Suggested time: 25 minutes

1. For $f(x)=x^2-4x+1$, f is increasing on:

A. R B. $(-\infty, 0)$ C. $(-\infty, 2)$ D. $(2, \infty)$

2. The minimum value of $x^2-6x+10$ is:

A. 1 B. 10 C. 3 D. -1

3. The local maximum of $f(x)=-x^2+4x$ occurs at $x=$:

A. 0 B. 2 C. 4 D. -2

4. If $f'(x)>0$ throughout an interval, f is:

A. Strictly decreasing B. Constant
C. Strictly increasing D. Always positive

5. For $f(x)=x^3-3x$, local maximum occurs at:

A. $x=3$ B. $x=0$ C. $x=-1$ D. $x=1$

6. The radius of a circle increases at 2 cm/s. At $r=3$ cm, its area increases at:

A. 6π cm²/s B. 18π cm²/s
C. 12π cm²/s D. 4π cm²/s

7. A sphere's radius increases at 1 cm/s. At $r=2$ cm, dV/dt is:

A. 16π cm³/s B. 8π cm³/s
C. 32π cm³/s D. 4π cm³/s

8. A square side increases at 2 cm/s. At side 5 cm, its area increases at:

A. 25 cm²/s B. 4 cm²/s C. 10 cm²/s D. 20 cm²/s

9. Among rectangles of perimeter 24 cm, the greatest area is:

A. 72 cm² B. 36 cm² C. 24 cm² D. 48 cm²

10. If $f'(a)=0$ and $f''(a)>0$, f has at a :

A. No extremum always
B. A local maximum
C. A local minimum
D. A discontinuity

11. For $f(x)=x^3$, the stationary point $x=0$ is:

A. A local minimum
B. A discontinuity
C. A local maximum
D. Neither maximum nor minimum

12. The maximum of $f(x)=x(8-x)$ on $[0, 8]$ is:

A. 16 B. 64 C. 8 D. 32

13. For $f(x)=1/x$, $x>0$, f is:

A. Constant
B. First increasing then decreasing
C. Strictly decreasing
D. Strictly increasing

14. If $s(t)=t^3-3t$, velocity at $t=2$ is:

A. 9 B. 6 C. 3 D. 12

15. The absolute minimum of x^2 on $[-2, 3]$ is attained at:

A. 0 B. -2 C. 3 D. Both endpoints

ANSWER KEY — check after completing all 15 questions

1.D 2.A 3.B 4.C 5.C 6.C 7.A 8.D 9.B 10.C 11.D 12.A 13.C 14.A 15.A