



Solutions of worksheet-18

SUBJECT – MATHEMATICS

Pre-test

Chapter: Applications of derivatives

Class: XII

Topic: Maxima & Minima

Date: 03.08.2020

Choose the correct option

(1 X 15= 15)

1. If a differentiable function $f(x)$ attains a local extremum at $x = a$, then—
 - (A) $f'(a) = 0, f''(a) < 0$
 - (B) $f'(a) < 0$
 - (C) $f'(a) = 0, f''(a) \neq 0$
 - (D) $f'(a) = 0, f''(a) > 0$
2. If a function is not differentiable at $x = c$, then the function—
 - (A) may attain a local maximum
 - (B) may attain a local minimum
 - (C) cannot attain an extremum
 - (D) may attain both a maximum or a minimum
3. In a given interval a function—
 - (A) can have two consecutive maxima;
 - (B) can have two consecutive minima;
 - (C) possesses maximum and minimum values alternately
 - (D) cannot have more than two extreme values.

4. The function $f(x) = 4x - x^2 - 3$ has a maximum value at—
Ⓐ $x = 3$ Ⓑ $x = 2$
Ⓒ $x = -2$ Ⓓ none of these
5. The minimum value of the function $y = x^2 - 6x + 11$ is—
Ⓐ 2 Ⓑ -2 Ⓒ 3 Ⓓ -3
6. Let $f(x) = x^3 - 9x^2 + 30x + 5$ be a differentiable function of x ; then—
Ⓐ $f(x)$ is minimum at $x = 3$
Ⓑ minimum value of $f(x)$ is 8
Ⓒ minimum value of $f(x)$ is greater than its maximum value
Ⓓ $f(x)$ possesses neither a maximum nor a minimum.
7. If $0 \leq x \leq 2\pi$, the function $f(x) = \sin x$ is minimum at—
Ⓐ $x = \frac{3\pi}{2}$ Ⓑ $x = \pi$ Ⓒ $x = \frac{3\pi}{4}$ Ⓓ $x = 2\pi$
8. The maximum value of the function $f(x) = 5 - x - x^2$ is—
Ⓐ $\frac{17}{4}$ Ⓑ $\frac{21}{4}$ Ⓒ -1 Ⓓ $\frac{19}{4}$

9. Let $x = c$ be a point in the domain of definition of a differentiable function; then $f(x)$ will have a local maximum at $x = c$ when—

- (A) $f'(c) = 0, f''(c) \neq 0$ (B) $f'(c) = 0, f''(c) > 0$
(C) $f'(c) = 0, f''(c) < 0$ (D) $f'(c) = 0, f''(c) = 0$

10. The minimum value of the function $f(x) = x^2 - x + 2$ is—

- (A) $\frac{1}{2}$ (B) $-\frac{1}{2}$ (C) $-\frac{7}{4}$ (D) $\frac{7}{4}$

11. If $-\pi \leq x \leq \pi$, then $f(x) = \cos x$ is maximum at—

- (A) $x = 0$ (B) $x = \frac{\pi}{2}$ (C) $x = \pi$ (D) $x = -\pi$

12. The critical points of the function $f(x) = \frac{2}{3}x^3 - \frac{3}{2}x^2 - 2x + 5$ are—

- (A) $\frac{1}{2}, -2$ (B) $-\frac{1}{2}, 2$ (C) $\frac{1}{2}, 2$ (D) $-\frac{1}{2}, -2$

13. The maximum value of the product of the two numbers if their sum is 12 is —

a. 30 b. 34 c. 36 d. 40

14. The minimum value of $2x^2 - 4x + 10$ is -

a. 7 b. 8 c. 9 d. 10

15. The maximum value of $(1 - x)(2 + 3x)$ is -

a. 7 b. $\frac{12}{25}$ c. 9 d. $\frac{25}{12}$

1.c , 2.d , 3.c ,
4.b , 5.a , 6.d ,
7.a , 8.b , 9.c ,
10.d , 11.a ,
12.b, 13.c , 14.b
, 15.d

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