

Chapter 5 Class 12 - Continuity & Differentiability - MCQ Worksheet 2 by teachoo

Chapter: [Chapter 5 Class 12 - Continuity & Differentiability](#)

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1. Logarithmic differentiation is a useful technique when the function involves:

- a) Only trigonometric terms.
- b) A function raised to the power of another function.
- c) A simple polynomial.
- d) A function that is not continuous.

2. The position of a particle is given by $x(t) = a \cos(t)$ and $y(t) = a \sin(t)$. This describes circular motion. The velocity vector's direction with respect to the position vector is always:

- a) Parallel.

- b) Perpendicular (tangential).
- c) In the opposite direction.
- d) At a 45-degree angle.

3. If $f''(x) > 0$ over an interval, what does this imply about the rate of change of the function?

- a) The function is increasing.
- b) The function's slope is increasing (the graph is concave up).
- c) The function is positive.
- d) The function's slope is decreasing (the graph is concave down).

4. The function $f(x) = \frac{1}{x-3}$ is discontinuous at $x = 3$. This type of discontinuity is called an infinite discontinuity. In a physical model, this would represent:

- a) A sudden stop.
- b) A value that becomes unboundedly large, like resonance.
- c) A gradual change.
- d) A simple jump.

5. If we know a function f is continuous on the closed interval $[a, b]$, we are guaranteed that:

- a) The function is also differentiable on $[a, b]$.
- b) The function has an absolute maximum and an absolute minimum on $[a, b]$.

- c) The function must be monotonic on $[a, b]$.
- d) The function must be a straight line.

6. The derivative of the function $f(x) = e^x$ is e^x . This unique property means that the value of the function is always equal to:

- a) Its curvature.
- b) Its x-intercept.
- c) Its rate of change.
- d) Its maximum value.

7. If $f(x) = g(h(x))$, and $h(x)$ represents converting degrees Celsius to Fahrenheit, while $g(x)$ represents the expansion of a metal rod at a given Fahrenheit temperature, then $f'(x)$ represents:

- a) The rate of expansion of the rod with respect to the temperature in Celsius.
- b) The total expansion of the rod.
- c) The conversion from Celsius to Fahrenheit.
- d) The temperature in Celsius.

8. A function is defined as $f(x) = x^2 \sin\left(\frac{1}{x}\right)$ for $x \neq 0$ and $f(0) = 0$. This function is:

- a) Continuous and differentiable at $x = 0$.
- b) Continuous but not differentiable at $x = 0$.
- c) Differentiable but not continuous at $x = 0$.
- d) Neither continuous nor differentiable at $x = 0$.

9. The second derivative, $f''(x)$, of a position function $f(x)$ represents:

- a) The particle's position.
- b) The particle's velocity.
- c) The particle's acceleration.
- d) The particle's jerk (rate of change of acceleration).

10. Why is the function $f(x) = \tan(x)$ discontinuous at $x = \frac{\pi}{2}$?

- a) Because $\sin\left(\frac{\pi}{2}\right) = 1$.
- b) Because the function is not defined, as it involves division by $\cos\left(\frac{\pi}{2}\right) = 0$.
- c) Because the graph has a sharp corner.
- d) Because the limit does not equal the function value.

Important links

- Answer of this worksheet - <https://www.teachoo.com/25573/5352/MCQ---Worksheet-2/category/Teachoo-Questions---MCQs/>

- Full Chapter with Explanation, Activity, Worksheets and more – <https://www.teachoo.com/subjects/cbse-maths/class-12th/>
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