

Class 12 Maths Chapter 5 Continuity and Differentiability MCQs For Practice

1. If $f(x) = 2x$ and $g(x) = (x^2/2)+1$ then which of the following can be a discontinuous function?

- (a) $f(x) + g(x)$
- (b) $f(x) - g(x)$
- (c) $f(x)g(x)$
- (d) $g(x)/f(x)$

2. The function $f(x) = (4 - x^2)/(4x - x^3)$ is

- (a) discontinuous at only one point
- (b) discontinuous at exactly two points
- (c) discontinuous at exactly three points
- (d) a continuous function

3. The function $f(x) = \cot x$ is discontinuous on the set

- (a) $\{x = n\pi; n \in \mathbb{Z}\}$
- (b) $\{x = 2n\pi; n \in \mathbb{Z}\}$
- (c) $\{x = (2n + 1)\pi/2; n \in \mathbb{Z}\}$
- (d) $\{x = n\pi/2; n \in \mathbb{Z}\}$

4. If $y = \log_e(x^2/e^2)$, then d^2y/dx^2 equals

- (a) $-1/x$
- (b) $-1/x^2$
- (c) $2/x^2$
- (d) $-2/x^2$

5. The function $f(x) = e^{|x|}$ is

- (a) continuous everywhere but not differentiable at $x = 0$
- (b) continuous and differentiable everywhere
- (c) not continuous at $x = 0$
- (d) none of the above

6. If $y = (\sin x + y)^{1/2}$, then dy/dx is equal to

- (a) $\cos x / (2y - 1)$
- (b) $\cos x / (2y + 1)$
- (c) $\sin x / (2y - 1)$
- (d) $\sin x / (1 - 2y)$

7. The derivative of $\cos^{-1}(2x^2 - 1)$ w.r.t $\cos^{-1}x$ is

- (a) 2
- (b) $2/x$
- (c) $-1/2(1 - x^2)^{1/2}$
- (d) $1 - x^2$

8. If $x = t^2$ and $y = t^3$ then d^2y/dx^2 is

- (a) $3/2$
- (b) $3/4t$
- (c) $3/2t$
- (d) $3/4$

9. If $y = \log_e[(1 - x^2)/(1 + x^2)]$, then dy/dx is equal to

- (a) $4x^3/(1 - x^4)$
- (b) $-4x/(1 - x^4)$
- (c) $1/(4 - x^4)$
- (d) $-4x^3/(1 - x^4)$

10. If $y = x^{\cos x} + (\cos x)^{\sin x}$, the value of dy/dx is

- (a) $x^{\cos x} [(\cos x)/x + \sin x \log_e x] + (\cos x)^{\sin x} [\sin x \tan x - \cos x \log_e(\cos x)]$
- (b) $x^{\sin x} [(\sin x)/x + \cos x \log_e x] + (\sin x)^{\cos x} [\cos x \tan x - \sin x \log_e(\sin x)]$
- (c) $x^{\cos x} [(\cos x)/x - \sin x \log_e x] + (\cos x)^{\sin x} [-\sin x \tan x + \cos x \log_e(\cos x)]$
- (d) $x^{\cos x} [(\cos x)/x + \sin x \log_e x] + (\cos x)^{\sin x} [\sin x \tan x + \cos x \log_e(\cos x)]$

* * * * * ANSWER KEYS* * * * *

- | | | | | |
|-----------|-----------|-----------|------------|------------|
| Q.1 - (d) | Q.2 - (c) | Q.3 - (a) | Q.4. - (d) | Q.5 - (a) |
| Q.6 - (a) | Q.7 - (a) | Q.8 - (a) | Q.9 - (b) | Q.10 - (c) |