



MATHS

BOOKS - CHHAYA PUBLICATION MATHS (BENGALI ENGLISH)

CONTINUITY AND DIFFERENTIABILITY

liiustrative Examples

1. Prove that the function f(x) = 5 is continuous at x = 2.

Watch Video Solution

2. Show that the function $f(x) = x^2 + 2x$ is continuous for every real

value of x .

3. Examine the continution of f (x) at x= 1 , where $f(x) = \begin{cases} \frac{|x-1|}{x-1} & \text{when } x \neq 1 \\ 0 & \text{when } x = 1 \end{cases}$ Watch Video Solution

4. Examine the continuity of the function
$$f(x) = \begin{cases} rac{|\sin x|}{x} & ext{when } x
eq 0 \\ 1 & ext{when } x = 0 \end{cases}$$

Watch Video Solution

5. Given that ,
$$f(x)= egin{cases} rac{1-\cos 4x}{x^2} & ext{if} \ x<0\ & ext{a} & ext{if} \ x=0\ & ext{} \ rac{\sqrt{x}}{\sqrt{16+\sqrt{x}-4}} & ext{if} \ x>0 \end{cases}$$

If f (x) is continuous at x= 0, find the value of a



6. A function $\phi(x)$ is defined as follows: $\phi(x) = \begin{cases} \frac{\tan 4x}{5x} & \text{when } x \neq 0 \\ \frac{5}{4} & \text{when } x = 0 \end{cases}$ Examine the cotinuity of $\phi(x)atx = 0$.

Watch Video Solution

7. Show that the function
$$f(x) = \begin{cases} x \cos \frac{1}{x} & \text{when} x \neq 0 \\ 0 & \text{when} x = 0 \end{cases}$$
 is continuous

at x=0.

Watch Video Solution

8. The function $f(x) = rac{2x^2-8}{x-2}$ is undefined at x=2 . What value must be

assigned to f(2), if f(x) is to be cotinuous at x = 2?

9.
$$f(x) = rac{1}{x}[\log(1+bx) - \log(1-ax)]$$
 is not defined at x=0 . What

value is to be assigned to f(0) so that f(x) will be continuous at x=0?

Watch Video Solution

10. The function $f(x)=rac{x^3-8}{x^2-4}$ is undefined at x =2 . Redefine the

function so as to make it cotinuous at x=2.

Watch Video Solution

11. Find the points of discontinuity of the following functions:

$$\frac{x^2-3x+5}{x^3-2x^2-5x+6}$$

Watch Video Solution

12. Find the points of discontinuity of the following functions:

 $\frac{1}{\sin\!\theta - \cos\!\theta}$

13. A function f (x) is defined as follows:

 $f(x) = egin{cases} x+2 & ext{when} \;\; x < 2 \ x^2-1 & ext{when} \;\; x \geq 2 \end{cases}$

Show that f(x) is discontinuous at x = 2 and the jump of the function at

this point is -1.

Watch Video Solution

14. Find the values of a and b such that the function f (x) defined by

$$f(x) = \left\{egin{array}{ll} x + a\sqrt{2}\sin x & 0 \leq x < rac{\pi}{4} \ 2x\cot x + b & rac{\pi}{4} \leq x \leq rac{\pi}{2} \ a\cos 2x - b\sin x & rac{\pi}{2} < x \leq \pi \end{array}
ight.$$

is continuous for all values of x in $0 \le x \le \pi$.

Watch Video Solution

15. If the following function f(x) is continuous at x=0, find the values of a,

b and c, where

$$\left\{egin{array}{ccc} rac{\sin{(a+1)\,x}+\sin{x}}{x} & ext{if} \;\; x < 0 \ c & ext{if} \;\; x = 0 \ rac{\sqrt{x+bx^2}-\sqrt{x}}{bx^{rac{3}{2}}} & ext{if} \;\; x > 0 \end{array}
ight.$$

Watch Video Solution

16. If
$$f(x) = \begin{cases} \frac{(1-\sin^3 x)}{3\cos^2 x} & x < \frac{\pi}{2} \\ a & x = \frac{\pi}{2} \\ \frac{b(1-\sin x)}{(\pi-2x)^2} & x > \frac{\pi}{2} \end{cases}$$
 is continuous at $x = \frac{\pi}{2}$, then the value of $\left(\frac{b}{a}\right)^{\frac{1}{3}}$ is watch Video Solution

17. If n = any integer , show that the function f(x) = [x] + [-x] has removable discontinuity at x=n , here [x] denotes greatest integer function.

18. Let f(x+y) = f(x) + f(y) for all real x and y . If f (x) is continuous

at x = 0, show it is continuous for all real values of x.



22. From first principle find the derivatives of each of the following functions w.r.t.x:

 $an^{-1} x$

Watch Video Solution

23. From first principle find the derivatives of each of the following functions w.r.t.x:

 $\log(\sin x)$

Watch Video Solution

24. From first principle find the derivatives of each of the following functions w.r.t.x:

 $\cos(\log x)$

25. Find from definition the derivatives of

 $x^2 e^x$



26. Find from definition the derivatives of

 $e^{\sqrt{\cot x}}$

Watch Video Solution

27. Differentiate the following functions with respect to x :

$$2x^4 - rac{4}{\sqrt[4]{x^3}} + rac{3x^2}{\sqrt[3]{x}} - 5$$

Watch Video Solution

28. Differentiate the following functions with respect to x :

$$2\log_3 x - e^{2\log x} + e^{2+x}$$

29. Find the derivatives of the following functions w.r.t x (or,u):

 5^x . x^5

Watch Video Solution

30. Find the derivatives of the following functions w.r.t x (or u):

$$ig(u^3+3^uig) {
m cosecu}$$

Watch Video Solution

31. Find the derivative of the following function w.r.t.x:

$$y = rac{\sin x}{\log x}$$

32. Examine the continuity and differentiability of
$$f(x) = 2x^2 + 1$$
 at $x = 1$.
Watch Video Solution

33. A function f (x) is defined as follows :

$$f(x) = egin{cases} x & ext{when} \;\; x \geq 0 \ -x & ext{when} \;\; x < 0 \end{cases}$$

Examine the cotinuity and differentiability of (x) at x=0.

Watch Video Solution

34. A function f (x) is defined as follows :

$$f(x) = \begin{cases} 5+2x \text{ when } -\frac{5}{2} < x \le 0\\ 5-2x \text{ when } 0 < x < \frac{5}{2} \end{cases}$$

Examine the continuity and differentiability of f (x) at x= 0

$$f(x) = |x+2| - 1, ext{evalute} \quad \lim_{x o -2+} \, rac{f(x) - f(-2)}{x+2} \, ext{ and } \, \lim_{x o -2-} \, rac{f(x)}{x+2}$$

. What can you say about the existence of $f'(x) \;\; \mathrm{at} x = \; - \; 2$?

Watch Video Solution

36. Let
$$f(x) = \begin{cases} rac{1}{x^2} \mathrm{sin} \left(x^2
ight) & ext{when } x
eq 0 \\ 0 & ext{when } x = 0 \end{cases}$$

Discuss the continuity of f(x) at x = 0.

Watch Video Solution

37. Find the cofficients a and b such that the following function f is

continuous and differentiable at $x = \pm 1$:

$$f(x) = \left\{egin{array}{ccc} rac{1}{|x|} & ext{when} & |x| \geq 1 \ ax^2 + b & ext{when} & |x| < 1 \end{array}
ight.$$

Watch Video Solution

lf

38. Prove that the function $f(x) = \sin \pi |x|$ is continuous at x = 0 but not

differntiable at the same point.



- B. f(0) infinite
- $\mathsf{C.} \, \lim_{x\,\rightarrow\,0}\,f(x)=f(0)$
- D. $\lim_{x
 ightarrow 0+} f(x) = \lim_{x
 ightarrow 0-} f(x)$

Answer: C



- C. continuous only at x = 0
- D. none of these

Answer: A

Watch Video Solution

3. The greatest integer function f(x) = [x] is -

A. continuous for all real values of x

B. continuous only at non-integral values of x

C. continuous at integral values of x

D. none of these

Answer: B

Watch Video Solution

4. The function $f(x) = x^k$ is continuous at x = k when -

A. k
eq 0

 $\mathsf{B.}\,k<0$

 $\mathsf{C}.\,k\leq 0$

D. $k \geq 0$

Answer: D

5. The points of discontinuties of the function $f(x)=rac{x+2}{2x^2-x-1}$ are -

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

Answer: C

Watch Video Solution

6. The function
$$f(x) = rac{\sin x}{\sin x - \cos x}$$
 is discontinuous at -

Watch Video Solution

Exercise 2 A Very Short Answer Type Questions

1. Define the discontinuity of f(x) at x = a



3. Show that the following functions are continuous at every real x :

k (a constant)

Watch Video Solution

4. Show that the following functions are continuous at every real x :

2x + 5

5. Show that the following functions are continuous at every real x :

 $3x^2 - 5x + 9$

Watch Video Solution

6. Show that the following functions are continuous at every real x :

cos x

Watch Video Solution

7. Show that the following functions are continuous at every real x :

 $x^2 + \sin x$



8. Show that the following functions are continuous at every real x :

 $3x^2 - 5x + 9$





11. Find the value of k for which the function

$$f(x) = egin{cases} kx+4 & ext{when} & x \leq \pi \ \cos x & ext{when} & x > \pi \end{cases},$$

is continuous at $x=\pi$.



12. Find the value of k for which the function

$$f(x) = \left\{egin{array}{ccc} kx+2 & ext{when} & x \leq \pi \ \cos x & ext{when} & x > \pi \end{array}
ight.$$

is continuous at $x=\pi$.



13. Let
$$f(x) = \begin{cases} 2x+1 & ext{when} \quad x < 2 \\ k+2 & ext{when} \quad x = 2 \\ 4x-3 & ext{when} \quad x > 2 \end{cases}$$
 Find the value of k for which f (x)

is continuous at x = 2.

Watch Video Solution

14. Indicate the points of discontinuity of the following functions:

$$\frac{x+2}{x^2-2x-3}$$

15. Indicate the points of discontinuity of the following functions:

$$rac{3x^2-4x}{x^3+x^2-x-1}$$

Watch Video Solution

16. Indicate the points of discontinuity of the following functions:

 $rac{1}{\sin x + \cos x}.$

Watch Video Solution

Exercise 2 A Short Answer Type Questions

1. A function f (x) is defined as follows:

$$f(x) = egin{cases} x^4 - 3 & ext{when} & x \leq 2 \ x^3 + 5 & ext{when} & x > 2 \end{cases}$$

Prove that the function f(x) is continuous at x = 2.

2. The definition of the function f (x) is given below: $f(x) = \begin{cases} \frac{1}{2} - x & \text{when } x < 3\\ 1 & \text{when } x = 3\\ x - \frac{1}{2} & \text{when } x > 3 \end{cases}$

Calculate f (3-0), f(3+0), f(3) and state whether f (x) is continuous at x = 3 or

not.

Watch Video Solution

3. A function f (x) is defined as follows:

$$\left\{egin{array}{ll} 5+2x & {
m for}-rac{5}{2}\leq x<0\ 5-2x & {
m for} \ \ 0\leq x<rac{5}{2}\ -5-2x & {
m for} \ \ x\geqrac{5}{2} \end{array}
ight.$$

Show that f (x) is continuous at x =0 and discontinuous at $x = \frac{5}{2}$.

Watch Video Solution

4. Given ,
$$f(x) = \left\{egin{array}{cc} rac{1-\cos3x}{x^2} & ext{when} & x
eq 0 \ 1 & ext{when} & x = 0 \end{array}
ight.$$

Prove that f(x) is discontinuous at x = 0.



5. For what value of f (4) the function $f(x) = rac{x^2-16}{x-4}$ is continuous at x

= 4 ?

Watch Video Solution

6. The function $f(x) = rac{x^2-4}{x^3-8}$ is undefined at x =1 , what should be the

value of f(1) such that f(x) may be continuous at x = 1?

Watch Video Solution

7. Differentiate $(2x-1)ig(3x^2+2ig)$ in the way mentioned below :

by using product rule

8. The function $f(x) = rac{1}{x}[\log(1+5x) - \log(1+3x)]$ is undefined at x =

0. What value must be assigned to f(0) if f(x) is to be continuous at x = 0

Watch Video Solution

Exercise 2 A Long Answer Type Questions

1. Given ,
$$f(x)= egin{cases} rac{\sin 5x}{3x} & ext{when} & x
eq 0 \ rac{3}{5} & ext{when} & x=0 \end{cases}$$

Examine the cotinuity of f(x) at x = 0.

Watch Video Solution

2. Let
$$f(x) = egin{cases} rac{x^2}{2} & ext{when} \ \ 0 \leq x < 1 \ 2x^2 - 3x + rac{3}{2} & ext{when} \ \ 1 \leq x \leq 2 \end{cases}$$

Discuss the continuity of (x) in the interval $0 \le x \le 2$.

3. Show that function f(x) = 2x - |x| is continous at x=0.



4. Test the continuity of the function f (x) :

 $f(x) = egin{cases} x^2 \sin rac{1}{x} & ext{when} & x
eq 0 \ 0 & ext{when} & x = 0 \end{cases}$

Watch Video Solution

5. A function f (x) is defined as follows : $f(x) = \left\{egin{array}{cc} 3x+1 & ext{for} & x\leq 1 \ 3-ax^2 & ext{for} & x>1 \end{array}
ight.$

If f(x) is continuous at x = 1, find the value of a.

6. A function f (x) is defined as

$$f(x) = egin{cases} ax+2 & ext{when} & x \leq 3 \ bx+3 & ext{when} & x > 3 \end{cases}$$

If f(x) is continuous at x =3 then find the relation between a and b.

7. Let
$$f(x) = \left\{ egin{array}{cc} rac{x^3 + x^2 - 16x + 20}{(x-2)^2} & ext{when} & x
eq 2 \ k & ext{when} & x = 2 \end{array}
ight.$$

if f (x) is continuous for all x , find k.

Watch Video Solution

8. Let
$$f(x) = \begin{cases} rac{1-\cos 2ax}{x\sin 2x} & ext{when } x
eq 0 \\ rac{1}{2} & ext{when } x = 0 \end{cases}$$
 If f (x) is continuous at x = 0,

find the value of α .

Watch Video Solution

9. If the following function f(x) is continuous at x = 0, find k:

$$f(x) = \left\{egin{array}{cc} rac{1-\cos 2mx}{2x^2} & ext{when} & x
eq 0 \ k & ext{when} & x=0 \end{array}
ight.$$

10. The function $f(x)=rac{x^3-1}{x-1}$ is undefined at x = 1 . Redefine the

function so as to make t continuous at x = 1.

Watch Video Solution

11. Show that the function
$$f(x) = \begin{cases} x + \frac{x+2}{|x+2|} & \text{when } x \neq -2 \\ -1 & \text{when } x = -2 \end{cases}$$
 is discontinuous at $x = -2$ Also find the jump of f (x) at this point of discontinuity.

Watch Video Solution

12. If the function
$$f(x) = egin{cases} 3ax+b & ext{for} \quad x>1\ 11 & ext{when} \quad x=1\ 5ax-2b & ext{for} \quad x<1 \end{cases}$$

is continuous at x = 1, find the values of a and b.

13. Let
$$f(x) = egin{cases} rac{1-\sin^3 x}{3\cos^2 x} & ext{if} \ x < rac{\pi}{2} \\ a & ext{if} \ x = rac{\pi}{2} \\ rac{b(1-\sin x)}{(\pi-2x)^2} & ext{if} \ x > rac{\pi}{2} \end{cases},$$

if f (x) is continuous at $x=rac{\pi}{2}$, find a and b .

Watch Video Solution

14. Let
$$f(x) = \begin{cases} rac{\sin{(a+1)x} + \sin{x}}{x}, & ext{when } x < 0 \\ ext{c}, & ext{when } x = 0 \\ rac{(x+bx^2)^{rac{1}{2}} - x^{rac{1}{2}}}{bx^{rac{3}{2}}}, & ext{when } x > 0 \end{cases}$$

If f (x) is continuous at x =0 , determine the values of a , b and c .

Watch Video Solution

15. Show that the function $f(x) = |\sin x + \cos x|$ is continuous at $x = \pi$.

16. Show that the function g(x) = x - [x] is discontinuous at all integral

points . Here [x] denotes the greatest integer function.

Watch Video Solution	

17. Find from the first principle , the derivatives of the following functions

w.r.t.x:

 $\sin^{-1}x$

Watch Video Solution

18. Find from the first principle , the derivatives of the following functions

w.r.t.x:

 $\cos^{-1}x$

19. Find from the first principle , the derivatives of the following functions

w.r.t.x:

 $e^{\sqrt{x}}$

Watch Video Solution	
----------------------	--

20. Find from the first principle , the derivatives of the following functions

w.r.t.x:

 $\log(\cos x)$

Watch Video Solution

21. Find from the first principle , the derivatives of the following functions

w.r.t.x:

 $\sin(\log x)$

22. Find from the first principle , the derivatives of the following functions

w.r.t.x:

 xe^x

Watch Video Solution

23. Find from the first principle , the derivatives of the following functions

w.r.t.x:

 $e^{\sqrt{\tan 2x}}$

Watch Video Solution

$$\mathbf{24.}\,f(x) = egin{cases} x^2-2x+3 & ext{for} & x < 1 \ 2 & ext{for} & x = 1 \ 2x^2-5x+5 & ext{for} & x > 1 \end{cases}$$

Examine the continuity and differentibility of the function f(x) at x = 1.

25. A function f (x) is defined as follows :

$$f(x) = egin{cases} 2-x, & ext{when} \quad x < 1 \ x^2 - 3x, & ext{when} \quad x \geq 1 \end{cases}$$

Examine the differentiability of the function f(x) at x=1, hence state

whether f(x) is continuous at x = 1 or not.

Watch Video Solution

26. If the function f (x) defined below is differentiable at x = 1 then find the

1

values of p and q .
$$f(x) = \left\{egin{array}{cc} x^2+3x+p, & ext{when} & x\leq 1 \ qx+3, & ext{when} & x>1 \end{array}
ight.$$

Watch Video Solution

27. If the function

$$f(x) = egin{cases} 2x+3, & ext{when} \quad x \leq 1 \ ax^2+bx, & ext{when} \quad x > 1 \end{cases}$$

is differentiable everywhere then show that f'(3) = -10

28. If f (x) is an even function and f'(0) exists, show that f'(0) = 0.



Exercise 2 A Multiple Choice Type Questions

1. State which of the following statements is true?

A. The function $f(x) = \log_e x$ is differentiable for all real x

B. If the function f(x) is continuous at x = a, then f(x) is differentible

at x = a

C. If the function f(x) is differentibele at x = a, then f(x) is continuous

at x = a

D. none of these

Answer: C



- **2.** The function f(x) = |x+1| -
 - A. continuous at x = -1
 - B. differntiable at x = 1
 - C. differntiable at $x=~\pm 1$
 - D. none of these

Answer: A

Watch Video Solution

Exercise 2 A Very Short Answer Type Questions

1. Find from the first principle , the derivatives of the following functions:

 e^{3x}

2. Find from the first principle , the derivatives of the following functions:

 $\log_3 x$



5. Examine whether f(x) = |2x| has a derivative at x = 0









Exercise 2 A Short Answer Type Questions

1. Show that the function f(x) = x|x| is continuous and differentiable at

x = 0

Watch Video Solution

$${f 2.}\,f(x)=\left\{egin{array}{ccc} 5x-4 & ext{when} & 0< x\leq 1\ 4x^2-3x & ext{when} & x>1 \end{array}
ight.$$

Discuss the continuity and differentiability of f(x) at x = 1

$${f 3.}\,f(x)=egin{cases} 2 & ext{when} \;\; x<0\ 2+\sin x \;\; ext{when} \;\; x\geq 0 \end{cases}$$

Show that f(x) is continuous at x = 0 but f'(0) does not exist.



4. Examine the continuity and differentiability of the function $f(x) = |\sin x| a t x = 0.$

Watch Video Solution



Watch Video Solution

Sample Questions For Competitive Examination Mutiple Correct Answers Type

$${f 1.}\,f(x)=\left\{egin{array}{cccc} rac{1}{5}ig(2x^2+3ig), & {
m for} & -\infty < x \leq 1\ 6-5x, & {
m for} & 1 < x < 3\ x-2, & {
m for} & 3 \leq x < \infty \end{array}
ight.$$
 then f is -

A. continuous at x = 1

B. discontinuous at x = 1

C. continuous at x = 3

D. discontinuous at x = 3

Answer: A::D

Watch Video Solution

2. If $f(x) = [x \sin(\pi x)]$ (where [x] is the greatest integer function) , then f (x) is -

A. continuous at 0

B. continuous in (0, 1)

C. derivable at 1

D. none of these

Answer: A::B

Watch Video Solution

3. Let $f(x) = \minig\{x, x^2ig\}(ext{where}\{x\} = x - [x], ext{where}[x]$ denotes the

greatest integer function), then -

A. f is comtinuous for all $x \in \mathbb{R}$,

B. f is derivable for all $x \in \mathbb{R}$

C. f is derivable for all x except 0, 1

D. none of these

Answer: A::C

View Text Solution

4. If $f(x) = x^3 \mathrm{sgn} x$ then-

A. f is derivable at 0

B. Lf'(0)=1

C. Rf'(0)=0

D. none of these

Answer: A::C

- 5. Let $f(x) = |\mathrm{log}|x \mid \ | \ , \ { t then}$
 - A. domain of $f=(0,\infty)$
 - B. domain of $f = \mathbb{R} \{0\}$
 - C. f is a continuous function
 - D. f is not differentiable at -1, 1

Answer: B::C::D



Sample Questions For Competitive Examination Integer Answer Type

1. Find the value of f (0) for which
$$f(x) = \frac{64(\sqrt{x+4}-2)}{\sin 2x}$$
 continuous .

atch Video Solution

2. Find the number of integral discontinuities of $f(x)=rac{ an x ext{tan}^{-1}igg(rac{1}{x}-1igg)}{x(x-2)(x-4)}$ Watch Video Solution

3. Find the number of points where f is continuous:

$$f(x)=x, x\in \mathbb{Q} \, ext{ and } \, f(x)=1-x, x\in \mathbb{R} ext{-}\mathbb{Q}$$

4. Let
$$f(\theta) = \sin\left(\tan^{-1}\left(\frac{\sin\theta}{\sqrt{\cos 2\theta}}\right)\right)$$
, where $-\frac{\pi}{4} < \theta < \frac{\pi}{4}$, then the value of is -



5. A continuous function $f:\mathbb{R} o\mathbb{R}$ satisfies relation $f(x)+f(2x+y)+5xy=f(3x-y)+2x^2+1$ for all $x,y\in\mathbb{R},$ then the value of |f(4)| is equal to -

Watch Video Solution

Sample Questions For Competitive Examination Matric Match Type

1. Check whether the function $rac{4x^2-1}{2x-1}$ is continuous or not?

Sample Questions For Competitive Examination

1. Differentiate $(5x^2+1)(3x-5)$ in the way mentioned below :

by using product rule

Watch Video Solution

Sample Questions For Competitive Examination Comprepension Type

1. Given , $f(x)=x^2+ax+3, g(x)=x+b ext{ and } f(x)=\lim_{n
ightarrow\infty} rac{f(x)+x^{2n}g(x)}{1+x^{2n}}$

If F(x) is continuous at x = 1, then -

A. b = a + 3

B. b = a - 1

 $\mathsf{C}.\,a=b-2$

 $\mathsf{D}.\,a=b+3$

Answer: A



2. Given ,
$$f(x)=x^2+ax+3, g(x)=x+b$$
 and $f(x)=\lim_{n o\infty} rac{f(x)+x^{2n}g(x)}{1+x^{2n}}$ If F (x) is continuous at $x=-1$, then - A. $a+b=-2$

B. a - b = 3

 $\mathsf{C}.\,a+b=5$

 $\mathsf{D}.\,a-b=2$

Answer: C

,

$$f(x) = x^2 + ax + 3, g(x) = x + b ext{ and } f(x) = \lim_{n o \infty} \; rac{f(x) + x^{2n}g(x)}{1 + x^{2n}}$$

If F (x) is continuous at $x = \pm 1$, then g (x) = f (x) has -

A. imaginary roots

B. both the roots positive

C. both the roots negative

D. roots of opposite signs

Answer: D

Watch Video Solution

4. Let $f(x)=\{\{:([x]], ..., 2lexle-(1)/(2)), (2x^(2)-1], ..., -(1)/(2)ltxle2):\}^m$ and

g(x)=f(|x|)+|f(x)|

$$igg[where[x] represents the greatest {
ight] e \geq r function.} igg] The
umber of p {
ightarrow swhere}$$

|f(x)|` is non -differentiable is -

A. 3		
B.4		
C. 2		
D. 5		

Answer: A

View Text Solution

5. Let $f(x)=\{\{:([x]], ..., 2lexle-(1)/(2)), (2x^(2)-1], ..., (1)/(2)ltxle2):\}^{m}$ and [g(x)=f(|x|)+|f(x)| [where [x] represents the greatest integer function.] The number of points where g (x) is non -differentiable is -

A. 4

B. 5

C. 2

D. 3

Answer: D



6. Let $f(x)=\{\{:([x]],,-2lexle-(1)/(2)),(2x^(2)-1],,-(1)/(2)ltxle2):\}^{m}$ and $g(x)=f(|x|)+|f(x)|^{(m)}$ [where [x] represents the greatest integer function.] The number of points where g (x) is discontinuous is -

A. 1

B. 2

C. 3

D. 4

Answer: B

View Text Solution

Sample Questions For Competitive Examination Assertion Reason Type

1. Let $f\colon \mathbb{R} o \mathbb{R}$ be a continuous function defined defined by $f(x) = rac{1}{e^x + 2e^{-x}}$

Statement - I: f(c)=(1)/(3)"for some "c in RRStatement - IIOltf(x)le(1)/(2sqrt(2))" for all "x in RR`

A. Statement -I is True , Statement -II is True , Statement -II is a correct explanation for statement -I

B. Statement -I is True , Statement -II is True , Statement -II is not a

correct explanation for Statement -I

C. Statement -I is True, Statement -II is false.

D. Statement - I is false , Statement -II is True .

Answer: A

View Text Solution

2. Let
$$g(x) = rac{e^{rac{1}{x}-1}}{e^{rac{1}{x}+1}} ext{for} \ x
eq 0 \ ext{and} \ g(0) = 0$$

Statement - I : The functions f (x)="xg"(x),x in RR $is \neg derivab \leq atx = 0Statement - II$ underset(xrarrO)(lim"g(x)` does not exist .

- A. Statement -I is True , Statement -II is True , Statement -II is a correct explanation for statement -I
- B. Statement -I is True, Statement -II is True, Statement -II is not a

correct explanation for Statement -I

C. Statement -I is True, Statement -II is false.

D. Statement - I is false , Statement -II is True .

Answer: A

View Text Solution