Continuity & Differentiability

TEST – 01

Q01. Find the total number of points at which $f(x)=\dfrac{1}{\log|x|}$ is discontinuous.

Q02. Discuss the continuity of the following function at $x=0$:

$$f(x)=\begin{cases}\dfrac{2|x|+x^2}{x}, & if\ x\neq 0\\ 0, & if\ x=0\end{cases}.$$

Q03. For what value(s) of 'a', the function $f(x)=\begin{cases}\dfrac{\sin ax^2}{x^2}, & if\ x\neq 0\\ \dfrac{3}{4}+\dfrac{1}{4a}, & if\ x=0\end{cases}$ is continuous at $x=0$?

Q04. Check the differentiability of $f(x)=\begin{cases}x-1, & if\ x<2\\ 2x-3, & if\ x\geq 2\end{cases}$ at $x=2$.

Q05. Show that the function $f(x)=\begin{cases}\dfrac{\sin x}{x}+\cos x, & if\ x\neq 0\\ 2, & if\ x=0\end{cases}$ is continuous at $x=0$.

Q06. Determine the values of 'a' and 'b' such that the function $f(x)$ is continuous at $x=2$:

$$f(x)=\begin{cases}ax^2+b, & x>2\\ 2, & x=2\\ 2ax-b, & x<2\end{cases}.$$

Q07. Find the left hand derivative and right hand derivative for $f(x)=\begin{cases}3x, & if\ x\leq 1\\ 4-x, & if\ x>1\end{cases}$ at $x=1$.

Q08. If $f(x)=\begin{cases}\dfrac{3^{x+2}-81}{9^x-81}, & if\ x\neq 3\\ k, & if\ x=3\end{cases}$ is continuous at $x=3$ then, find the value of k.

Q09. Discuss the continuity of $f(x)=\begin{cases}\dfrac{|\sin x|}{x}, & if\ x\neq 0\\ 1, & if\ x=0\end{cases}$ at $x=0$.

Q10. For what value(s) of 'a' and 'b' the following function is continuous at $x=-2$:

$$f(x)=\begin{cases}a+\dfrac{x+2}{|x+2|}, & x<-2\\ a+b, & x=-2\\ b+\dfrac{x+2}{|x+2|}, & x>-2\end{cases}.$$

Answers of Continuity & Differentiability

TEST – 01

Q01. Two Q02. Discontinuous Q03. $1,-1/4$ Q04. Non Differentiable

Q06. $a=\dfrac{1}{2}, b=0$ Q07. $LHD=3, RHD=-1$ Q08. $\dfrac{1}{4}$ Q09. Discontinuous

Q10. $a=1, b=-1$.

 # Any query regarding any question in this test? Write to me on ***theopgupta@gmail.com***