# ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

FOR GOD AND COUNTRY

## Solutions of worksheet-8

## SUBJECT – MATHEMATICS

**Pre-test**

**Chapter: Continuity & Differentiability** **Class: XII**

**Topic: Continuity & Differentiability** **Date: 13.06.2020**

**Choose the correct option** **(1 X 15= 15)**

1. **The function f(x) is continuous at x=0 if -**

   a) $\lim_{x\to 0} f(x)$ *exists*.
   b) $f(0)$ *is infinite*.
   c) $\lim_{x\to 0} f(x) = f(0)$
   d) $\lim_{x\to 0+} f(x) = \lim_{x\to 0-} f(x)$

2. **The function** $f(x) = |x|$ *is* $-$

   a) **Continuous at all real values of x**
   b) **Discontinuous at x=0**
   c) **Continuous only at x=0**
   d) **None of these.**

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

   a) **Continuous at all real values of x**
   b) **Continuous only at non-integral values of x**
   c) **Continuous at all integral values of x**
   d) **None of these.**

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

   a) $k \neq 0$ , b) $k < 0$ , c) $k \leq 0$ , d) $k \geq 0$

5. The point of discontinuities of the function $f(x) = \frac{x+2}{2x^2-x-1}$ are -

a) $\frac{1}{2}, -1$ , b) $-\frac{1}{2}, -1$ , c) $-\frac{1}{2}, 1$ , d) $\frac{1}{2}, 1$

6. The function $f(x) = \frac{1}{\sin x - \cos x}$ is discontinuous at -

a) $n\pi + \frac{\pi}{4}, n \in \mathbb{Z}$ , b) $n\pi + (-1)^n \frac{\pi}{4}, n \in \mathbb{Z}$ , c) $n\pi - \frac{\pi}{4}, n \in \mathbb{Z}$ , d) $n\pi + \frac{3\pi}{4}, n \in \mathbb{Z}$

7. The function $f(x) = \begin{cases} \frac{|x-1|}{x-1}, & when\ x \neq 1 \\ 0, & when\ x = 1 \end{cases}$

a) Continuous at all real values of x
b) Discontinuous at x=1
c) Continuous only at x=1
d) None of these.

8. Let $f(x+y) = f(x) + f(y),\ \forall x, y \in \mathbb{R}$. *If* $f(x)$ is continuous at x=0, then f(x) -

a) Continuous at all real values of x
b) Discontinuous at x=1
c) Continuous only at x=1
d) None of these.

9. The function $f(x) = \begin{cases} 2x+1, & when\ x < 2 \\ k, & when\ x = 2 \\ 3x-1, & when\ x > 2 \end{cases}$

Find the value of k for which f(x) is continuous at x=2.

a) 5 , b) 0 , c) -2 , d) 3

10. The function $f(x) = |x+1|$ *is* –

a) Continuous at $x = -1$
b) Differentiable at $x = 1$
c) Differentiable at $x = \pm 1$
d) None of these.

11. Let the function $f(x) = |x|$. Then at $x = 0$ the function is –

a) Not Continuous .
b) Continuous but not differentiable
c) Differentiable but not Continuous
d) Differentiable and Continuous.

12. The function $f(x) = \begin{cases} x \sin\frac{1}{x} & when\ \ x \neq 1 \\ 0, & when\ \ x = 1 \end{cases}$

Then at $x = 0$ the function is –

a) Not Continuous .
b) Continuous but not differentiable
c) Differentiable but not Continuous
d) Differentiable and Continuous.

13. The function $f(x) = x - [x]$ , where $[.]$ denotes the greatest integer function, is -

a) Continuous everywhere.
b) Continuous only at non-integral values of x.
c) Continuous at all integral values of x.
d) Differentiable everywhere.

14. The function $f(x) = 1 + |\cos x|$ is –

a) Continuous no where
b) Continuous everywhere
c) Not differentiable at x=0
d) Not differentiable at $x = n\pi,\ \ n \in \mathbb{Z}$.

15. The set of points where the function $f(x)$ given by $f(x) = |x - 3| \cos x$ is differentiable , is –

a) $\mathbb{R}$
b) $\mathbb{R} - \{3\}$
c) $(0, \infty)$
d) None of these.

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