



INDIAN SCHOOL DARSAIT DEPARTMENT OF MATHEMATICS



Subject :MATHEMATICS Topic :CONTINUITY & DIFFERENTIALITY (5)

Date :14-5-2017

Resource Person:PremelaIsac

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Name of the Student: _____

Class &Division:

Roll. Number:

Sl.No.	Questions	Marks
1	Show that function $f(x)= x - 3 $, $n \in R$ is continuous but not differentiable at $x = 3$.	4
2	Find the value of K for which $f(x) = \frac{\sqrt{1+Kx} - \sqrt{1-Kx}}{x} \quad \text{if } -1 \leq x \leq 0$ $= \frac{2x-1}{x-1} \quad \text{if } 0 \leq x < 1$	4
3	Show that $f(x)=2x - x $ is continuous but not differentiable at $x = 0$	4
4	Find a so that $f(x) = a \sin\left(\frac{\pi}{2}(n+1)\right) \text{ if } x \leq 0$ $= \frac{\cos nx - \sin nx}{x^2} \text{ if } x > 0$	4
5	If the function $f(x)$ given by $f(x) = 3ax + b \quad \text{if } x > 1$ $= 11 \quad \text{if } x = 1$ $= 5ax - 2b \quad \text{if } x < 1$ Is continuous at $x=1$ find a and b.	4
6	Find the values of a and b such that $f(x) = 5 \quad \text{if } x \leq 2$ $= ax + b \quad \text{if } 2 < x < 10$ $= 21 \quad \text{if } x \geq 10$ Is a continuous function.	4
7	Find the relationship between a and b so that $F(x) = ax + 1 \quad \text{if } x \leq 3$ $bx + 3 \quad \text{if } x > 3$ is continuous at $x = 3$.	4
8	Find all points of discontinuity of $f(x) = x + 3 \quad \text{if } x \leq -3$ $-2x \quad \text{if } -3 < x < 3$ $6x + 2 \quad \text{if } x \geq 3$	4

9	<p>Determine a,b,c for which the function</p> $f(x) = \frac{\sin[(a+1)x] + \sin ax}{x} \quad ; \text{ if } x < 0$ $= c \quad ; \text{ if } x = 0$ $= \frac{\sqrt{x+bx^2} - \sqrt{x}}{bx^{\frac{3}{2}}} \quad ; \text{ if } x > 0$ <p>is continuous at $x=0$ (where $b \neq 0$)</p>	4
10	<p>Let $f(x) = \frac{1 - \sin^3 x}{3 \cos^2 x} \quad ; \text{ if } x < \frac{\pi}{2}$</p> $= a \quad ; \text{ if } x = \frac{\pi}{2}$ $= \frac{b(1 - \sin x)}{(\pi - 2x)^2} \quad ; \text{ if } x > \frac{\pi}{2}$ <p>is continuous at $x = \frac{\pi}{2}$ find a and b.</p>	4
11	<p>Find a relation between a and b so that the function $f(x)$ defined by $f(x) = \begin{cases} ax+1, & x \leq 3 \\ bx+3, & x > 3 \end{cases}$ is continuous at $x = 3$.</p>	
12	<p>Discuss the continuity of the following function at $x=0$</p> $F(x) = \frac{x^4 + 2x^3 + x^2}{\tan^{-1} x}, x \neq 0$ $0, x = 0$	
13	<p>Find the relationship between a and b so that the function f, defined by</p> $F(x) = ax+1, \text{ if } x \leq 3$ $bx+3, \text{ if } x > 3$ <p>is continuous at $x=3$.</p>	

Dear Children,
There is no substitute for hard work.
All the best. God Bless.