MATHS

BOOKS - PATHFINDER MATHS (BENGALI ENGLISH)

CONTINUITY & DIFFERENTIABILITY

Question Bank

1. If f(x) =|x-2|+1, evaluat $Lt_{x \to 2+} \frac{f(x) - f(2)}{x - 2}$ and $Lt_{x \to 2-} \frac{f(x) - f(2)}{x - 2}$. What can you say

about the existence of f'(x) at x=2?

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2. Is the function defined by $f(x) = x^2 - \sin x + 5$ continuous at x=pi?

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3. Discuss the continuity of the function [1-x]+[x-1] at the point x=1.

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4. If $f(x) = \begin{cases} \frac{x-5}{|x-5|} + a & \text{if } x < 5 \\ a + b & \text{if } x = 5 \\ \frac{x-5}{|x-5|} + b & \text{if } x > 5 \end{cases}$

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5. Show that the following funtion is continuous

$|1 - x + |x||$.

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6. Find the inverse function of the function f(x) $= 2^{x(x-1)} (x > 0)$.

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7. Examine the continuity of the following funtion $f(x) = \begin{cases} |x| & \text{if } x \leq 2 \\ [x] & \text{if } x > 2 \end{cases} on [0, 2]$

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8. Given, $f(x) = \frac{x-1}{2x^2-7x+5}$ when `xne1

Find the derivative of f(x) at x=1

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9. Let ,$f(x) = \frac{1}{x}\sin\left(x^2\right)$ when x $\neq 0$

=0 when x=0

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

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10. The funtion $f(x) = \dfrac{x^3 - 8}{x^2 - 4}$ is undefined at x=2.

Redefine the funtion so as to make it continuous at x=2

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11. The funtion $f(x) = \dfrac{\log(1 + ax) - \log(1 - bx)}{x}$ is not define at x=0. Find the value of f(0),so that f(x)is continuous at x=0.

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12. Determine the values of a so that the funtion is continuous at x=1.

$f(x) = x^2 + 4$ when $x \leq 2$.

$= x^2 + a^2$, when $x < 1$.

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13. $f(x) = \dfrac{x^2 - 1}{x^3 - 1}$ is undefined at x=1. What should be the value of f(x) at x=1 such that f(x) may be continuous at x=1?

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