المادة: الرياضيات

المرحلة: الاولى

المحاضر : م.م رياض حامد

2021-2022

Lecture (6)

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(Continuous Functions) : الدوال المستمرة

The Continuity Test:

The function **y= f (x)** is continuous at **x=c** if and only if the following statements are true:

1- **f (c) exists**
2- $\lim_{x\to c} f(x)$ **exists**
3- **f (c) =** $\lim_{x\to c} f(x)$

Example: did the function $f(x) = 8 - x^3 - 2x^2$ is continuous at the x=2 ?

Sol:

$$f(2) = 8 - 2^3 - 2 * (2)^2 = 8$$

$$\lim_{x\to 2}[\, 8 - x^3 - 2x^2 \,] = 8 - 2^3 - 2 * (2)^2 = 8$$

$$f(2) = \lim_{x\to 2} f(x).$$

So the function is continuous at x=2.

Example: did the function $f(x) = \frac{(x^2-4)}{x-2}$ is continuous at the x=2 ?

Sol:

$$f(2) = \frac{(2^2-4)}{2-2} = \frac{0}{0}$$ not exists

So the function is not continuous at x=2.

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H.W:

1- did the function $f(x) = \frac{(x^2-9)}{x-3}$ is continuous at the x=3 ?

2- Find the limit of the function $f(x) = \frac{(x^2-1)}{x-\sqrt{1}}$ is continuous at the x=$\sqrt{1}$?